ACUTE COMMUNICABLE DISEASE CONTROL

ANNUAL MORBIDITY REPORT
AND
SPECIAL STUDIES REPORT

2003

Los Angeles County
Department of Health Services

Public Health
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Medical Director

Acute Communicable Disease Control
Annual Morbidity Report
2003

● EXECUTIVE SUMMARY ●

In Los Angeles County (LAC), more than 80 diseases and conditions are reportable by law. This mandatory reporting requirement also includes unusual disease occurrences and outbreaks. Acute Communicable Disease Control (ACDC) is the lead program for the surveillance and investigation of most communicable diseases—responsibilities exclude tuberculosis, sexually transmitted diseases, and adult cases of HIV or AIDS. Surveillance is primarily passive with reports submitted by facsimile, mail, or telephone. The urgency of reporting varies according to disease and ranges from reporting required within 7 days of identification to immediate reporting by telephone to the LAC Department of Health Services (DHS).

In addition to disease surveillance and investigation, ACDC sets policy and makes procedural recommendations for DHS activities that are related to infectious and communicable diseases. Our program interprets and enforces state and federal laws and regulations, and interfaces with other jurisdictions, programs and agencies responsible for public health. ACDC frequently serves as a consultant to the medical community on issues of communicable and infectious diseases and provides education to medical professionals.

ACDC has several units and special projects, each with unique goals and objectives for the surveillance and control of communicable disease:

- **Food and Water Safety Unit**: The aim of this unit is to decrease morbidity related to food and waterborne pathogens through surveillance to detect outbreaks and monitor trends. Pathogens of special interest include: *Listeria*, norovirus and *Salmonella*.
- **Vectorborne Diseases and Central Nervous System Unit**: This unit conducts surveillance and provides disease consultation for a variety of vectorborne and zoonotic diseases (e.g., West Nile virus, meningococcal and other causes of encephalitis and meningitis). Special studies such as varicella (chickenpox) surveillance are also conducted by this unit.
- **Hospital Outbreaks Unit:** This unit assists hospitals with outbreak investigations, consults on infection control issues
- **Bloodborne Pathogens and Antimicrobial Resistance Unit**: Conducts investigations and provides education and awareness of antimicrobial resistance issues.
- **Immunization Program**: The mission of this program is to improve the immunization coverage levels of LAC and prevent the occurrence or

Los Angeles County:
A description of our community

In order to fully appreciate the magnitude of responsibilities required of ACDC and the impact of communicable disease in LAC, it is important to understand the character and dynamics of the county we serve. LAC is one of the nation's largest counties covering over 4,000 square miles. While LAC enjoys fairly temperate year-round weather conditions, it encompasses a wide variety of geographic areas including mountain ranges, arid desert areas and over 80 miles of coastal regions. As such, LAC is home to a very diverse wildlife population. One of the greatest challenges of disease surveillance, response and control in our county is responding to its enormous size. In 2003, LAC had the largest population (nearly 10 million) of any county in the US and is exceeded by only eight states. Even within the large state of California, LAC is densely populated—over one-fourth of the state's population resides in our county. Accordingly, medical services in LAC are also extensive—LAC is home to approximately 120 hospitals, 80 emergency departments, more than 30,000 licensed physicians, and over 100 infection control professionals.

Another considerable challenge to communicable disease surveillance and control in LAC is the extensive diversity of our population coupled with our high level of immigration. Our county is home to an especially varied population; nearly half of our residents are Latino (46.8%), around one-third White (30.3%), and around one-in-ten Asian (13.3%) or Black (9.3%). Over 90 languages were recorded as a primary language spoken other than English by school children in a Los Angeles Unified School District survey. There is also substantial economic diversity within our county. While LAC is world renowned for its areas of wealth and privilege such as Beverly Hills and Bel Air, there is also considerable poverty—the 2000 US census recorded over 1.5 million residents (nearly 16% of LAC's population) living in poverty. LAC is also a major port of entry for immigrants to the US. According to the 1999 Los Angeles County Health Survey, almost one-third of respondents stated they were born outside of the US. In 2002, the Immigration Naturalization Report found that California was home to the largest number of legal immigrants to the US, and over one-third of these immigrants to California reported settling in LAC. In addition to immigration, the population in our county is highly mobile. In terms of air travel alone in 2003, almost 55 million travelers came through the Los Angeles International airport (40,346,127 domestic and 14,623,903 international)—making it the nation's 3rd busiest airport.

vaccine-preventable diseases. Program activities include perinatal hepatitis B case management and the newly developed smallpox vaccine program.

- **Pediatric HIV Projects**: These monitor pediatric human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) disease in LAC through active surveillance and research activities.
- **Bioterrorism Preparedness and Response Unit**: The aim of this unit is to plan, train and enhance surveillance and epidemiology capacity to detect and respond to a bioterrorist event. Efforts also include syndromic surveillance and establishing and maintaining internet-based health alert systems and training networks.

Additional information about ACDC and the aforementioned units are available at: www.lapublichealth.org/acd/index.htm.

Emerging and Re-emerging Infectious Diseases—Los Angeles County, 2003

Emerging Infectious Diseases

- During 2003, SARS accounted for over 8,000 cases and nearly 800 deaths worldwide. In LAC, none of the 22 cases investigated for SARS tested positive for SARS Co-V infection.
- In fall of 2003, a novel influenza virus caused considerable concern and illness; however, the severity of the season in terms of hospitalizations and deaths was comparable if not lower than other type A influenza seasons.

Every year several existing diseases acquire added prominence and new diseases emerge—2003 was no exception. Undoubtedly, the most notable novel disease to emerge in recent years is severe acute respiratory syndrome (SARS). SARS was the first highly virulent, readily transmissible respiratory infectious disease to impact our modern global society. While the advent of a new infectious disease was not surprising, what was alarming was how rapidly it spread—over the course of just a few months in the spring of 2003, cases were identified in more than two dozen countries across several continents with the majority of cases occurring in Asia. The first human cases were identified in November 2002 in Guandong, a southern province of mainland China, and once containment of was declared 8 months later, over 8,000 cases were reported worldwide—of these, 774 died. Fortunately, the US escaped both widespread illness and community transmission; only 8 cases with laboratory confirmed SARS infection were reported in the US, all had traveled to other parts of the world.[1]

In LAC over the course of nearly 6 months (from late March 2003 when the first potential local SARS case was identified until case identification was terminated by the CDC in mid-August), a total of 22 cases were investigated for possible SARS infection in our county—none of these cases had a specimen positive for SARS Co-V. More than half of the investigated cases (68%, n=15) were classified as a suspect SARS case since their illness did not progress to pneumonia and they showed no signs of respiratory distress syndrome. Many (32%, n=7) were foreign cases, not local residents, who were visiting our county or identified when traveling through the Los Angeles International airport. The SARS exposure risk factor for all but one of the cases (a child of another LAC suspect case) was travel to a SARS-associated location, all from various areas in Asia (e.g., China, Taiwan). None of the potential cases held sensitive occupations or were healthcare employees. A more detailed review of our SARS investigation, response and lesson learned is provided in the Special Disease Summaries.

Beyond SARS, novel influenza viruses emerge almost yearly and cause considerable morbidity and mortality even in mild seasons. In the summer of 2003, a novel influenza strain emerged (A/Fujian/411/2003), and more importantly, identification of this strain occurred too late to be included the 2003–2004 vaccine. By late-November 2003, the US media depicted nationwide influenza activity as unusually and unexpectedly severe and deadly—and their numerous fear-provoking reports instigated a

1 CDC. Revised U.S. surveillance case definition for severe acute respiratory syndrome (SARS) and update on SARS cases—United States and worldwide, December 2003. MMWR 2003; 52(49):1202–1206. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5249a2.htm

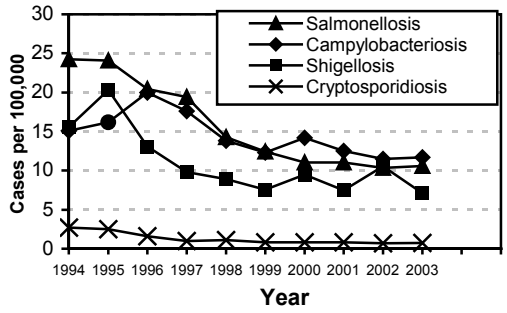
ground swell of intense public anxiety and demand for vaccination. However, despite the intense concern and attention influenza received during this season, a review of local and national surveillance measures indicates the overall severity of the season was actually quite typical—while more severe than the previous three years (which were exceptionally mild), the season was comparable, if not lower, in levels of morbidity and mortality to other seasons characterized by a type A viral strain, such as the 1999–2000 season. For instance, while there was an overwhelming increase in positive viral isolates reported in 2003–2004, as compared to the 1999–2000 season, there were fewer influenza-related hospitalizations and fewer pneumonia/influenza deaths. A more detailed review of the season including a summary of the enhanced pediatric influenza surveillance initiated in fall 2003 is provided in the Special Disease Summaries.

Food and Waterborne Diseases

- The incidence of food and waterborne diseases, especially bacterial diseases, has declined since the 1990s and has stabilized in recent years.
- An exception to the declining trend is reported *E. coli* O157:H7 infections for 2001 through 2003 which were greater than the prior ten year average.
- Despite decreasing incidence, food and waterborne diseases continue to cause considerable morbidity and mortality; ACDC investigated 25 foodborne outbreaks in 2003.

Diseases spread by food and water sources make up much of the investigations and activities conducted by ACDC. Overall, food and waterborne diseases have declined since the mid-1990's and have stabilized at lower rates as in Figure 1 (see campylobacteriosis, cryptosporidiosis, listeriosis, salmonellosis, shigellosis, typhoid fever and vibriosis individual annual reports for more details). The declining trend in cases is most evident among the bacterial diseases salmonellosis, campylobacteriosis and shigellosis. These findings mirror national trends depicting sustained decreases among many foodborne illnesses—particularly those of bacterial origin.[2,3,4] While the underlying causes for these local and national trends are not known, the implementation of many control measures are believed to be important factors in the reduction of food and water-related illnesses. On a national level, these include the expansion of federal food safety and inspection services as well as increased attention to fresh produce safety. Locally, a highly publicized restaurant grading system implemented in 1998 may have also advanced food safety as well as education for food handlers and the public regarding best practices to reduce foodborne disease.

Figure 1
Food and Waterborne Disease
Incidence Rates by Year
LAC and US, 1994–2003



A notable exception to this decreasing trend is in cases of enterohemorrhagic *Escherichia coli*. During 2003, there were 27 confirmed *E. coli* O157:H7 cases reported in LAC, and in 2002, 30 confirmed cases—the incidence during both years was much higher than the average number of cases from the previous 10 years (19 cases per year on average from 1993–2002, Table 1). Nationally, the incidence of *E. coli* O157:H7 infection varies considerably each year and also varies geographically.

2 CDC. Preliminary FoodNet data on the incidence of foodborne illnesses—Selected sites, United States, 2001. MMWR 2002; 51(15); 325-329. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5215a4.htm
3 CDC. Preliminary FoodNet data on the incidence of foodborne illnesses—Selected sites, United States, 2002. MMWR 2003; 52(15): 340-343. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5115a3.htm
4 CDC. Preliminary FoodNet Data on the incidence of infection with pathogens transmitted commonly through food—Selected Sites, United States, 2003. MMWR 2004; 53(16); 338-343. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5316a2.htm

Although many food and water sources have been implicated in the transmission of *E. coli* O157:H7, illness is most often associated with contaminated beef products. In 2003, ACDC investigated two multi-county outbreaks due to *E. coli*—both determined to have originated from contaminated ground beef. This suggests that in spite of the decreases shown among other food and waterborne illnesses, further industry improvements and enhanced public education are still needed, especially with regard to meat processing and cooking practices.

Table 1. Food and waterborne disease incident cases, 10-year average versus incident cases in 2003, LAC

Disease	10-year average, 1993–2002	Number of cases 2003
Salmonellosis	1,431	996
Campylobacteriosis	1,301	1,100
Shigellosis	1,041	669
Amebiasis	171	121
Cryptosporidiosis*	115	71
Listeriosis, nonperinatal	23	17
Listeriosis, perinatal	9	3
Vibriosis*	17	13
Typhoid fever, carrier	5	2
Typhoid fever, acute	27	16
E. coli O157:H7*	19	27

* Advances in antiretroviral therapy may account for much of the decrease in cryptosporidiosis cases.

In 2003, ACDC investigated 25 foodborne disease outbreaks involving 379 individuals with illness. There were no waterborne disease outbreaks. A specific pathogen was identified by laboratory testing in nearly half (48%) of these outbreaks. See the Foodborne Outbreaks report for more information.

While the overall incidence of these diseases has been decreasing, food and waterborne diseases continue to account for considerable morbidity and mortality—thousands of preventable infections occur yearly. While the majority of people infected by these illnesses improve without complications, these diseases may cause invasive disease especially among children, the elderly and those with certain chronic medical conditions (e.g., the immunocompromised) and account for numerous hospitalizations and fatalities every year. In LAC, food or waterborne diseases were a contributing factor in at least 20 deaths during 2003. Accordingly, further efforts to improve food and water quality and to educate food industry and the public about proper food handling are needed.

Vectorborne Diseases

- Environmental indicators of WNV were first identified in LAC and So. California during 2003.
- In 2003, one human case of WNV-infection was identified in LAC.

Vectorborne Diseases

During 2003, West Nile virus (WNV) was the most significant vectorborne disease to emerge in both LAC and Southern California. While the first California case of WNV was diagnosed in an LAC resident in 2002, the identification of this case occurred without the local presence of supportive environment indicators that typically precede human cases. But in 2003, the environmental presence of the virus became well established—across Southern California, substantial numbers of WNV-infected mosquito pools and WNV-infected dead crows, sentinel chickens other bird species were identified. In addition, three laboratory-confirmed human cases of WNV infection were documented in Southern California—this included one case from our county. The LAC case had a history of mosquito exposure in mid-October 2003 (see Special Reports), was diagnosed with WNV fever, and subsequently recovered uneventfully.

In addition to WNV infection, other vectorborne diseases that are monitored by ACDC include murine typhus, lyme disease, and malaria (malaria infections do not originate in LAC). There were no significant changes or trends among these diseases during 2003.

Vaccine Preventable Diseases

LAC has shared in the national decrease in most vaccine preventable diseases over the past decade. As a result of high childhood vaccination coverage levels that approach or exceed 90% for many individual vaccines and exceed 80% for the combination of 4 DTaP, 3 OPV, and 1-MMR (so called the 4-3-1) among 2 year-olds, the incidence of vaccine preventable diseases has reached record low levels.

The challenge remains to completely eradicate pertussis which, despite being 96% less common than before the age of vaccines, continues to show 2- to 3-year cycles of increased activity in LAC as well as nationally. This low continued baseline pertussis activity results from waning immunity after vaccination, which results in adolescents and adults that were vaccinated as children being susceptible to reinfection if exposed. These adolescents and adults are thus capable of transmitting the bacteria to young infants who have not yet completed their pertussis vaccination series. Implementation of a pertussis booster for adolescents and adults may address this problem once an acellular pertussis vaccine receives approval for adult usage.

Another challenge is maintaining an active, sensitive, rash illness surveillance system when the incidence of diseases like measles is so low. Although there were no cases of measles reported in our county in 2003, 133 suspect cases were reported and actively investigated. This surveillance is particularly important because LAC is the final destination or an important transit point for many individuals traveling from parts of the world where the measles virus is still circulating.

Finally, the LAC Immunization Program faces the important challenge of effectively educating healthcare providers on the appropriate use of new vaccines as they receive FDA approval. 2003 saw the approval of a new pentavalent vaccine for use in government funded child health prevention programs. This new vaccine protects children from five different childhood diseases and can result in children receiving one to two fewer injections during any given immunization office visit.

Antibiotic Resistance, Invasive Bacterial Infections and Hepatitis

Outbreaks of community-associated methicillin resistant *Staphylococcus aureus* (CAMRSA) continued in 2003, including a recurrent outbreak in a football team and more than 1,800 cases recorded in the County Jail. In response to the increasing number of reports of CAMRSA, LAC DHS made MRSA reportable in children <18 years old for 6 months in 2003. Extensive clinical and risk factor information was collected, and many isolates were further characterized.[5] In addition, a case-control study of risk factors for CAMRSA in HIV+ men who have sex with men was also conducted. These MRSA studies are described in more detail in the Special Reports for 2003.

2003 was the first full year that the new Invasive Group A Streptococcus (IGAS) reporting form was used. This form allowed ACDC to better describe the different manifestations of IGAS including necrotizing fasciitis and streptococcal toxic shock syndrome. A notable decrease in incidence was seen in children <1 year from 2002 to 2003 (from 8.0 to 2.2 cases/100,000), which has yet to be explained. The incidence of invasive pneumococcal disease (IPD) also decreased in 2003 to the lowest rate in 10 years (5.95/100,000). The continued decrease in IPD has been attributed to the introduction of Prevnar®, a conjugated pneumococcal vaccine developed for children <2 years. Furthermore, the rate of penicillin resistance in IPD also decreased to a 4-year low of 18%.

- In 2003, hospitalized pediatric MRSA infections were temporarily added to the list of reportable diseases.
- The number of CAMRSA infections continued to increase, but IGAS and IPD decreased.
- Hepatitis A infections have reached an all-time low.

The number of hepatitis A cases dropped in 2003, yielding the lowest rate ever recorded in our county (4.0/100,000); the decrease in cases was seen in all age groups. However, the number of acute hepatitis B cases increased in 2003 with the largest increase seen in those over the age of 45 years. There have been increasing reports of hepatitis B associated with nosocomial transmission and ACDC is developing a supplemental questionnaire for all cases of hepatitis B and C that are over 50 years old to investigate the possibility of nosocomial transmission of these important bloodborne pathogens.

5 Hathaway S, Bancroft E. Community associated MRSA in hospitalized children: Results of an interim analysis. The Public's Health 2003; 3(7):4-5. Available at: www.lapublichealth.org/wwwfiles/ph/ph/ph/TPHSeptember2003.pdf

Pediatric HIV/AIDS

Pediatric HIV and AIDS continue to be a serious public health issue—both locally and worldwide. Since the mid-90's, the number of incident HIV and AIDS cases in LAC has decreased from 32 cases in 1998 to only 8 in 2001. This may be due to medical advances, especially treatments that reduce the likelihood of perinatal transmission of HIV infection, coupled with advances in detection and maternal education. In 2003, 22 HIV-infected children were reported including 6 who were born in 2003. New cases occur primarily among mother's who were never tested during their prenatal care, and those who received little or no prenatal care—these mothers tend to be at highest risk or HIV infection and subsequent transmission to their babies.

To increase the number of pregnant women tested for HIV during prenatal care, HIV was added to the list of routine prenatal tests mandated by California law (California Health and Safety Code Sections 125085, 125090, 125105, and 125107). Under this ordinance, pregnant women must sign a consent form for the HIV test and have the right to refuse the test. However, by making testing a part of routine care, practitioners should be encouraged to ensure all pregnant women are tested. If during labor and delivery there is no documentation of the test in the woman's medical chart, she is to be tested, again with her consent. The OraQuick® rapid test is available for rapid testing during labor and delivery so that treatment to prevent HIV transmission can be initiated if the test is positive. ACDC is seeking ways to inform practitioners of the new prenatal HIV testing law.

Bioterrorism Preparedness

Bioterrorism Preparedness

- In 2003, BT-related surveillance projects were expanded and integrated into public health. These systems were shown to be useful indicators of morbidity and mortality.
- Throughout the year, a critical core of public health personnel was vaccinated against smallpox.

During 2003, ACDC's bioterrorism surveillance and preparedness activities continued to become integrated into public health. Emergency Department syndromic surveillance, detecting major trends from baseline patterns of illness that may potentially identify bioterrorist activity, was continued at several local hospitals. In 2003, Syndromic surveillance has shown the ability to detect patterns of illness and community outbreaks and will be useful in complementing traditional disease surveillance activities. The Unusual Death Surveillance System is also a complementary surveillance system developed to identify deaths possibly related to bioterrorism or emerging infectious diseases and has identified previously undetected cases of reportable public health conditions. In addition to maintaining surveillance activities, the infrastructure to administer the smallpox vaccine was developed and established in LAC and a critical core of public health personnel were vaccinated against smallpox. These activities are described in the 2003 Special Reports.

In 2001, the mandated list of reportable diseases was modified to provide greater emphasis on diseases deemed to be significantly likely agents for bioterrorism activity (anthrax, botulism, brucellosis, plague, smallpox, tularemia and viral hemorrhagic fevers). Education to strengthen awareness and understanding of disease and outbreak reporting continued throughout 2003.

Acute Communicable Disease Control

Annual Morbidity Report

2003

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ACUTE COMMUNICABLE DISEASE CONTROL
ANNUAL MORBIDITY REPORT
2003

TABLE OF CONTENTS

Acute Communicable Disease Control
2003 Annual Morbidity Report

Table of Contents (cont.)

ACUTE COMMUNICABLE DISEASE CONTROL
ANNUAL MORBIDITY REPORT
2003

MAP LIST

ACUTE COMMUNICABLE DISEASE CONTROL
ANNUAL MORBIDITY REPORT
2003

TABLE LIST

Los Angeles County Demographic Data

Tables of Notifiable Diseases

Tables Within Disease Summary Chapters

Table List (cont.)

Tables in Disease Outbreak Summary Chapters

Tables in Special Disease Summary Chapters

OVERVIEW

ACUTE COMMUNICABLE DISEASE CONTROL
ANNUAL MORBIDITY REPORT
2003

PURPOSE

The Acute Communicable Disease Control (ACDC) Annual Morbidity Report of the Los Angeles County Department of Health Services (DHS), Public Health is compiled to:

1. summarize annual morbidity from several acute communicable diseases occurring in Los Angeles County (LAC);
2. assess the effectiveness of established communicable disease control programs;
3. identify patterns of disease as a means of directing future disease prevention efforts;
4. identify limitations of the data used for the above purposes and to identify means of improving that data; and
5. serve as a resource for medical and public health authorities at county, state and national levels.

Note: The 2003 ACDC Annual Morbidity Report does not include information regarding the following diseases: tuberculosis, sexually transmitted diseases, or adult HIV and AIDS. Information regarding these diseases is available from their respective departments (see the LAC Public Health website for more information www.lapublichealth.org.

LAC DEMOGRAPHIC DATA

Population estimates used for this report are created by the Population Estimates and Projections System (PEPS) provided to the LAC DHS, Public Health by Urban Research. There are two distinctive sets of population numbers, estimates and projections. Normally, the demographer starts off of making projections within a 5-year range based mainly on released US Census data. Then, as time elapses and when real relevant numbers become available (e.g., DMV records, Voters' registry, school enrollment and immigration records etc.), estimates are made retrospectively. The most recent PEPS data sets were completed in 2003. As such, it contains estimates up to and including the year of 2003, and projections to 2007. The 2003 LAC population data used in this report are these PEPS estimates.

National and California state counts of reportable diseases were obtained from the Centers for Disease Control and Prevention (CDC) Final 2003 Reports of Notifiable Diseases.1 This report also includes US Census population estimates—these were used to calculate national and California rates of disease. According to that report, the population of the US in 2003 was 287,974,000 and the population of California was 35,002,000.

Long Beach and Pasadena are separate reporting jurisdictions, as recognized by the California Department of Health Services, and as such these two cities maintain their own disease reporting systems. Therefore, disease episodes occurring among residents of Long Beach and Pasadena have been excluded from LAC morbidity data, and their populations subtracted from LAC population data. Exceptions to this rule are noted in the text when they occur.

1 CDC. Final 2003 reports of notifiable diseases. MMWR 2004; 53(30):687. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5330a6.htm

Table A. Los Angles County* population by year, 1998–2003

Year	Population	% change
1998	8,792,921	
1999	8,853,999	0.7%
2000	8,968,327	1.3%
2001	9,122,861	1.7%
2002	9,253,109	1.4%
2003	9,398,128	1.6%

* Does not include cities of Pasadena and Long Beach.

Table B. Los Angles County* population by age group, 2003

Age (in years)	Population	%
<1	136,810	1.5%
1–4	551,049	5.9%
5–14	1,508,416	16.1%
15–34	2,809,150	29.9%
35–44	1,429,538	15.2%
45–54	1,178,397	12.5%
55–64	746,838	7.9%
65+	1,037,930	11.0%
Total	**9,398,128**	**100.0%**

* Does not include cities of Pasadena and Long Beach.

Table C. Los Angles County* population by sex, 2003

Sex	Population	%
Male	4,623,140	49.2%
Female	4,774,988	50.8%
Total	**9,398,128**	**100.0%**

* Does not include cities of Pasadena and Long Beach.

Table D. Los Angles County* population by race, 2003

Race	Population	%
Asian	1,250,578	13.3%
Black	874,531	9.3%
Latino	4,399,752	46.8%
White	2,844,851	30.3%
Other**	28,416	0.3%
Total	**9,398,128**	**100.0%**

* Does not include cities of Pasadena and Long Beach.
** Includes American Indian, Alaskan Native, Eskimo and Aleut.

Table E. Los Angles County* population by health district and SPA, 2003

Health District	Population
SPA1	**334,366**
Antelope valley	334,366
SPA 2	**2,102,020**
East Valley	446,097
Glendale	349,030
San Fernando	433,843
West Valley	873,050
SPA 3	**1,682,887**
Alhambra	354,367
El Monte	460,414
Foothill	308,750
Pomona	559,356
SPA 4	**1,186,851**
Central	342,350
Hollywood Wilshire	523,193
Northeast	321,308
SPA 5	**646,290**
West	646,290
SPA 6	**1,003,993**
Compton	286,150
South	176,079
Southeast	165,847
Southwest	375,917
SPA 7	**1,350,923**
Bellflower	365,970
East Los Angeles	213,984
San Antonio	444,818
Whittier	326,151
SPA 8	**1,090,798**
Inglewood	426,807
Harbor	204,316
Torrance	459,675
Total	**9,398,128**

* Pasadena and Long Beach are separate health jurisdictions and as such are excluded from this table.

DATA SOURCES

Data on occurrence of communicable diseases in LAC were obtained through passive and sometimes active surveillance. Every health-care provider or administrator of a health facility or clinic, and anyone in charge of a public or private school, kindergarten, boarding school, or preschool knowing of a **case or suspected case** of a communicable disease is required to report it to the local health department as specified by the California Code of Regulations (Section 2500). Immediate reporting by telephone is also required for any **outbreak** or **unusual incidence** of infectious disease and any **unusual disease** not listed in Section 2500. Laboratories have separate requirements for reporting certain communicable diseases (Section 2505). Health-care providers must also give detailed instructions to household members in regard to precautionary measures to be taken for preventing the spread of disease (Section 2514).

1. Passive surveillance relies on physicians, laboratories, and other health-care providers to report diseases of their own accord to the DHS using the Confidential Morbidity Report (CMR) form, electronically, by telephone, or by facsimile.

2. Active surveillance entails ACDC staff regularly contacting hospitals, laboratories and physicians in an effort to identify all cases of a given disease.

DATA LIMITATIONS

This report should be interpreted in light of the following notable limitations:

1. Underreporting.
   The proportion of cases that are not reported varies for each disease. Evidence indicates that for some diseases as many as 98% of cases are not reported.

2. Reliability of Rates.
   All vital statistics rates, including morbidity rates, are subject to random variation. This variation is inversely related to the number of events (observations, cases) used to calculate the rate. The smaller the frequency of occurrence of an event, the less stable its occurrence from observation to observation. As a consequence, diseases with only a few cases reported per year can have highly unstable rates. The observation and enumeration of these “rare events” is beset with uncertainty. The observation of zero events is especially hazardous.

   To account for these instabilities, all rates in the ACDC Annual Morbidity Report based on less than 19 events are considered “unreliable.” This translates into a relative standard error of the rate of 23% or more, which is the cut-off for rate reliability used by the National Center for Health Statistics. Therefore, rates based on less than 19 events will not be reported because their standard errors and reliability cannot be determined. Readers may calculate the rates on their own using standard population tables.

   In the Annual Morbidity Report, rates of disease for groups (e.g., Latino versus non-Latino) are said to differ significantly only when two criteria are met: 1) group rates are reliable and 2) the 95% confidence limits for these rates do not overlap. Confidence limits are calculated only those rates which are reliable.

3. Case Fatality Rates.
   Some deaths from communicable diseases may not appear on LAC’s Vital Records computer files. Deaths are filed with only underlying cause of death indicated. Any contributing or otherwise significant conditions, including communicable diseases, are not indicated in the computer record. Also, case-fatality percent is based on deaths that occurred in 2001 regardless of year of disease onset; therefore, fatality data should be interpreted with caution.

Some deaths from communicable diseases may not appear on LAC's Vital Records computer files. Deaths are filed with only underlying cause of death indicated. Any contributing or otherwise significant conditions, including communicable diseases, are not indicated in the computer record. Also, case-fatality percent is based on deaths that occurred in 2001 regardless of year of disease onset; therefore, fatality data should be interpreted with caution.

4. Case Definitions.
To standardize surveillance, CDC case definition for infectious diseases under public surveillance2 is used with some exceptions as noted in the text of the individual diseases. Since verification by a laboratory test is required for the diagnosis of some diseases, cases reported without such verification may not be true cases. Therefore, an association between a communicable disease and a death or an outbreak possibly may not be identified.

5. Onset Date versus Report Date.
Some cases of disease occurring in 2003 were not reported until after this annual report was completed. Slight differences in the number of cases and rates of disease for 2003 may be observed in subsequent annual reports. Any such disparities are likely to be small.

6. Population Estimates.
Estimates of the LAC population are subject to many errors. Furthermore, the population of LAC is in constant flux. Though not accounted for in census data, visitors and other non-residents may have an effect on disease occurrences.

7. Place of Acquisition of Infections.
Some cases of diseases reported in LAC may have been acquired outside of the county. This may be especially true for many of the diseases common in Latino and Asian populations. Therefore, some disease rates more accurately reflect the place of diagnosis than the location where an infection was acquired.

8. Health Districts and Service Planning Areas.
In 1994, the following health district boundaries changed: Central, Compton, Glendale, Inglewood, Northeast, San Fernando, West, and Torrance. San Fernando Health District was split into Antelope Valley and San Fernando Health Districts. In 1999, the 24 individual health districts were grouped into eight Service Planning Areas (SPA): SPA 1, Antelope Valley; SPA 2, San Fernando Valley; SPA 3, San Gabriel; SPA 4, Metro; SPA 5, West; SPA 6, South; SPA 7, East; and SPA 8, South Bay.

9. Race/Ethnicity Categories.
   - **Asian** – person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.
   - **American Indian** – person having origins in any of the original peoples of North America and who maintain cultural identification through tribal affiliation or community recognition.
   - **Black** – person having origins in any of the black racial groups of Africa.
   - **Latino** – person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
   - **White** – person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

STANDARD REPORT FORMAT

1. Crude data.
   - **Number of Cases**: For most diseases, this number reflects new cases of the disease with an onset in 2003. If the onset was unknown, the date of diagnosis was used.

2 CDC. Case Definitions for Infectious Conditions under Public Health Surveillance," MMWR 1997;46(RR-10):1-57. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00047449.htm

- **Annual Incidence Rates in LAC**: Number of new cases in 2003 divided by 2003 LAC census population (minus Long Beach and Pasadena) multiplied by 100,000.
- **Annual Incidence Rates in the US and California**: 2003 incidence rates for the US and California were taken from the previously cited CDC publication, Morbidity and Mortality Weekly Report (MMWR). The MMWR records diseases by date of report rather than date of onset.
- **Mean Age at Onset**: Arithmetic average age of all cases.
- **Median Age at Onset**: The age that represents the midpoint of the sequence of all case ages.
- **Range of Ages at Onset**: Ages of the youngest and oldest cases in 2003. For cases under one year of age, less than one (<1) was used.
- **Case Fatality**: Number of deaths in 2003 due to disease (when data were available) divided by the number of new cases of the disease in 2003, expressed as a percentage. Note that deaths may be due to infections acquired prior to 2003.

2. Etiology.
   This includes the causative agent, mode of spread, common symptoms, potential severe outcomes, susceptible groups, and vaccine-preventability.

3. Disease Abstract.
   This provides a synopsis or the highlights of disease activity in 2003.

4. Stratified Data.
   - **Trends**: Any trends in case characteristics during recent years.
   - **Seasonality**: Number of cases that occurred during each month of 2003.
   - **Age**: Annual rate of disease for individual age groups. Race-adjusted rates are presented for some diseases.
   - **Sex**: Male-to-female rate ratio of cases.
   - **Race/Ethnicity**: Annual rate of disease for the five major racial groups. Cases of unknown race are excluded; thus, race-specific rates may be underestimates. Age-adjusted rates are presented for some diseases.
   - **Location**: Location presented most often is the health district or SPA of residence of cases. Note that "location" rarely refers to the site of disease acquisition. Age-adjusted rates by location are presented for some diseases.

5. Prevention.
   If applicable, includes a description of county programs and other measures that address the disease.

6. Comments.
   Describes miscellaneous information not fitting easily into above categories, as well as elaboration of some findings of interest.

7. Additional Resources.
   Provides agencies, phone numbers, websites, and other resources on the subject.

TABLE F. LIST OF ACRONYMS

The following abbreviations and acronyms may be found throughout this report.

95%CI	95 percent confidence interval	**HD**	Health District
ACDC	Acute Communicable Disease Control	**Hib**	*Haemophilus influenzae*, type b
AIDS	Acquired immunodeficiency syndrome	**HIV**	Human immunodeficiency virus
AR	Attack rate	**IgG**	Immunoglobulin G
CDC	Centers for Disease Control and Prevention	**IgM**	Immunoglobulin M
CDHS	California Dept. of Health Services	**LAC**	Los Angeles County
CMR	Confidential morbidity report	**MMR**	Mumps-Measles-Rubella vaccine
CSF	Cerebral spinal fluid	**MMWR**	Morbidity & Mortality Weekly Report
DHS	Department of Health Services	**N/A**	Not available
DTaP	Diphtheria-tetanus-acellular pertussis	**OR**	Odds ratio
DTP	Diphtheria-tetanus-pertussis vaccine	**PCP**	*Pneumocystis carinii pneumonia*
EHS	Environmental Health Services	**PHBPP**	Perinatal Hepatitis B Prevention Prgm.
GI	gastrointestinal	**RR**	Rate ratio or relative risk
GE	gastroenteritis	**SNF**	Skilled nursing facility
HAV	Hepatitis A virus	**sp. or spp.**	Species
HBIG	Hepatitis B Immunoglobulin	**SPA**	Service Planning Area
HBsAg	Hepatitis B surface antigen	**US**	United States
HBV	Hepatitis B virus	**VCMR**	Visual confidential morbidity report (software)
HCV	Hepatitis C virus		

LOS ANGELES COUNTY HEALTH DISTRICTS:

AH	Alhambra	**FH**	Foothill	**SE**	Southeast
AV	Antelope Valley	**GL**	Glendale	**SF**	San Fernando
BF	Bellflower	**HB**	Harbor	**SO**	South
CE	Central	**HW**	Hollywood/Wilshire	**SW**	Southwest
CN	Compton	**IW**	Inglewood	**TO**	Torrance
EL	East Los Angeles	**NE**	Northeast	**WE**	West
EV	East Valley	**PO**	Pomona	**WV**	West Valley
EM	El Monte	**SA**	San Antonio	**WH**	Whittier

TABLES OF NOTIFIABLE DISEASES

Table G. Reported Cases of Selected Notifiable Diseases by Year of Onset LAC, 1998-2003

Disease	Year of Onset 1998	1999	2000	2001	2002	2003	Previous 5-year Average	5-Yr 95% upper Limit[a]
Amebiasis	157	134	109	139	102	121	128	168
Botulism	1	3	0	2	2	0	2	4
Brucellosis	2	3	4	9	11	7	6	13
Campylobacteriosis	1217	1089	1273	1141	1067	1100	1157	1309
Cholera	3	0	0	0	0	1	1	3
Coccidioidomycosis	53	48	58	68	76	73	61	80
Cryptosporidiosis	93	71	68	77	62	71	74	95
Cysticercosis	24	28	43	37	18	12	30	48
Dengue	5	3	3	5	7	0	5	8
E. *coli* O157:H7	22	12	27	31	31	27	25	39
Encephalitis	48	39	49	41	61	38	48	63
Foodborne outbreaks	34	39	40	48	29	25	32	42
Giardiasis	672	592	509	446	441	401	532	706
Haemophilus influenzae type b	7	0	1	6	3	0	3	9
Hansen's Disease (Leprosy)	13	10	9	2	11	9	8	15
Hepatitis A	940	1120	839	542	438	374	776	1270
Hepatitis B	92	66	65	44	32	73	60	100
Hepatitis C	12	21	10	1	3	0	9	23
Hepatitis unspecified	13	9	11	1	0	1	7	17
Kawasaki syndrome	33	29	35	24	9	14	26	44
Legionellosis	20	16	14	18	25	21	19	26
Listeriosis, nonperinatal	24	21	19	27	14	17	21	30
Listeriosis, perinatal	7	12	8	3	7	3	7	13
Lyme disease	2	8	7	5	8	6	6	10
Malaria	50	62	43	46	38	60	48	64
Measles	3	1	5	8	0	0	3	9
Meningitis, viral[b]	443	226	263	378	466	899	355	543
Meningococcal infections	50	49	53	58	46	32	51	59
Mumps	21	23	29	17	16	10	21	30
Pertussis	77	238	102	103	171	130	138	254
Psittacosis	0	1	0	1	0	0	0	1
Q-fever	1	0	1	1	4	0	1	4
Relapsing fever	0	1	0	0	1	0	0	1
Rheumatic fever, acute	0	1	1	6	0	0	2	6
Rubella	0	0	3	0	0	0	1	3
Salmonellosis	1253	1101	990	1006	956	995	1061	1271
Shigellosis	784	669	849	684	974	669	792	1012
Strongyloidiasis	5	5	1	0	0	0	2	7
Tetanus	2	2	0	2	2	1	2	3
Trichinosis	3	0	0	0	0	0	1	3
Tularemia[b]	0	0	0	0	0	1	0	0
Typhoid fever, case	17	20	21	17	33	16	22	33
Typhoid fever, carrier	12	4	6	1	6	2	6	13
Typhus fever	7	6	17	8	11	12	10	18
Vibrio	30	3	13	15	14	13	15	32

[a] The normal distribution assumption may not apply to some rare diseases.

[b] 2003 data over 95% upper limit.

Table H. Annual Incidence Rates of Selected Notifiable Diseases by Year of Onset LAC, 1998-2003

Disease	Annual Incidence Rate (Cases per 100,000) [b]					
	1998	1999	2000	2001	2002	2003
Amebiasis	1.79	1.51	1.22	1.52	1.10	1.29
Botulism	0.01	0.03	-	0.02	0.02	-
Brucellosis	0.02	0.03	0.04	0.10	0.12	0.07
Campylobacteriosis	13.84	12.30	14.19	12.51	11.53	11.70
Cholera	0.03	-	-	-	-	0.01
Coccidioidomycosis	0.60	0.54	0.65	0.75	0.82	0.78
Cryptosporidiosis	1.06	0.80	0.76	0.84	0.67	0.76
Cysticercosis	0.27	0.32	0.48	0.41	0.19	0.13
Dengue	0.06	0.03	0.03	0.05	0.08	-
E. *coli* O157:H7	0.25	0.14	0.30	0.34	0.34	0.29
Encephalitis	0.55	0.44	0.55	0.45	0.66	0.40
Giardiasis	7.64	6.69	5.68	4.89	4.77	4.27
Haemophilus influenzae type b	0.08	-	0.01	0.07	0.03	-
Hansen's Disease (Leprosy)	0.15	0.11	0.10	0.02	0.09	0.10
Hepatitis A	10.69	12.65	9.36	5.94	4.73	3.98
Hepatitis B	1.05	0.75	0.72	0.48	0.35	0.78
Hepatitis C	0.14	0.24	0.11	0.01	0.03	-
Hepatitis unspecified	0.15	0.10	0.12	0.01	0.00	0.01
Kawasaki syndrome	0.38	0.33	0.39	0.26	0.10	0.15
Legionellosis	0.23	0.18	0.16	0.20	0.27	0.22
Listeriosis, nonperinatal	0.27	0.24	0.21	0.30	0.15	0.18
Listeriosis, perinatal	4.74	8.26	5.46	2.05	4.96	2.12
Lyme disease	0.02	0.09	0.08	0.05	0.09	0.06
Malaria	0.57	0.70	0.48	0.50	0.41	0.64
Measles	0.03	0.01	0.06	0.09	-	-
Meningitis, viral	5.04	2.55	2.93	4.14	5.04	9.57
Meningococcal infections	0.57	0.55	0.59	0.64	0.50	0.34
Mumps	0.24	0.26	0.32	0.19	0.17	0.11
Pertussis	0.88	2.69	1.14	1.13	1.85	1.38
Psittacosis	-	0.01	-	0.01	-	-
Q-fever	0.01	-	0.01	0.01	0.04	-
Relapsing fever	-	0.01	-	-	0.01	-
Rheumatic fever, acute	-	0.01	0.01	0.07	-	-
Rubella	-	-	0.03	-	-	-
Salmonellosis	14.25	12.44	11.04	11.03	10.33	10.6
Shigellosis	8.92	7.56	9.47	7.50	10.53	7.12
Strongyloidiasis	0.06	0.06	0.01	-	-	-
Tetanus	0.02	0.02	-	0.02	0.02	0.01
Trichinosis	0.03	-	-	-	-	-
Tularemia	-	-	-	-	-	0.01
Typhoid fever, case	0.19	0.23	0.23	0.19	0.36	0.17
Typhoid fever, carrier	0.14	0.05	0.07	0.01	0.06	0.02
Typhus fever	0.08	0.07	0.19	0.09	0.12	0.13
Vibrio	0.34	0.03	0.14	0.16	0.15	0.14

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 live births.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table I. Five-Year Average of Notifiable Diseases by Month of Onset
LAC, 1999-2003

Disease	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total[a]
Amebiasis	10.8	8.8	8.2	9.2	9.8	9.0	10.0	10.4	10.2	9.4	6.4	6.6	119.6
Botulism	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.2	1.2
Brucellosis	0.6	0.8	0.8	0.2	0.2	0.0	0.8	0.6	0.4	1.2	0.4	0.2	6.6
Campylobacteriosis	73.0	61.2	72.8	89.0	114.0	117.8	130.2	119.2	107.8	97.8	87.8	62.8	1136.2
Cholera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Coccidioidomycosis	6.2	3.4	3.8	4.6	4.0	3.2	5.8	4.0	4.6	5.2	3.6	3.6	60.8
Cryptosporidiosis	5.4	3.8	2.6	3.0	4.6	3.6	5.8	9.8	7.4	5.8	5.6	5.4	68.8
Cysticercosis	2.6	1.0	2.6	2.6	3.2	0.6	1.0	3.0	1.6	2.2	0.8	1.0	25.0
Dengue	0.6	0.4	0.0	0.2	0.4	0.0	0.6	0.0	0.6	0.0	0.0	0.2	3.4
E. *coli* O157:H7	1.6	1.0	1.6	1.0	1.6	4.2	6.2	3.2	4.0	2.2	1.6	0.2	28.4
Encephalitis	3.4	3.8	2.8	3.6	3.0	3.4	2.8	3.2	3.0	3.4	2.4	3.8	42.6
Giardiasis	34.2	26.8	35.2	38.2	34.8	40.4	47.4	47.2	45.2	35.4	35.4	24.4	474.8
Haemophilus influenzae type b	0.2	0.2	0.4	0.2	0.4	0.2	0.0	0.2	0.2	0.0	0.0	0.0	2.0
Hansen's Disease (Leprosy)[a]	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis A	58.0	50.6	50.2	46.0	51.4	50.2	53.4	65.2	75.6	53.0	39.2	34.0	658.4
Hepatitis B	5.0	6.0	5.4	5.8	4.4	4.2	3.8	3.6	1.2	4.4	4.4	3.4	55.8
Hepatitis C[b]	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.3	0.3	1.3
Hepatitis unspecified	0.6	0.4	0.4	0.2	0.8	0.0	0.0	0.0	0.2	0.0	0.0	0.2	6.2
Kawasaki syndrome	2.2	2.6	3.0	1.4	2.2	2.0	0.8	1.8	1.2	0.8	0.2	1.2	20.8
Legionellosis	1.2	1.6	1.2	1.2	1.8	2.0	1.6	0.8	1.2	1.8	1.8	0.8	18.6
Listeriosis, nonperinatal	0.6	0.8	1.2	0.6	2.8	3.8	1.8	2.0	1.8	1.8	1.2	1.2	19.6
Listeriosis, perinatal	0.2	0.2	0.4	0.6	0.6	1.0	1.0	0.8	1.0	0.6	0.2	0.0	6.6
Lyme disease	0.2	0.0	0.4	0.4	0.2	0.6	0.8	1.0	0.6	0.6	0.0	0.2	4.6
Malaria[a]	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles	0.2	0.4	0.6	0.4	0.6	0.6	0.2	0.2	0.0	0.2	0.0	0.0	3.4
Meningitis, viral	16.2	11.0	15.6	15.2	18.8	29.6	55.0	64.8	57.4	40.0	30.2	16.8	445.6
Meningococcal infections	6.2	6.4	7.2	5.8	3.0	3.6	2.4	1.4	2.2	3.0	1.8	4.6	47.6
Mumps	2.2	2.4	1.8	0.8	2.4	2.0	1.2	1.0	0.8	1.8	0.8	1.2	17.6
Pertussis	7.3	5.4	4.6	6.7	6.6	8.7	9.7	12.4	12.5	10.6	6.6	9.0	148.8
Psittacosis	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.4
Q-fever	0.4	0.2	0.0	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	1.2
Relapsing fever	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.4
Rheumatic fever, acute	0.6	0.2	0.4	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	1.6
Rubella	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.6
Salmonellosis	65.8	47.8	61.8	80.0	89.0	101.2	114.8	115.6	110.4	90.2	73.6	52.8	1008.2
Shigellosis	70.4	35.0	35.2	31.0	40.4	54.8	96.8	119.4	97.8	82.8	56.0	46.2	768.6
Strongyloidiasis	0.2	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Tetanus	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.0	0.2	1.4
Trichinosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tularemia	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Typhoid fever, case	1.2	1.0	2.8	2.2	1.6	2.2	1.8	2.6	3.0	1.0	0.4	1.2	21.0
Typhoid fever, carrier	0.0	0.2	0.6	0.0	0.4	0.2	0.4	0.4	0.2	0.0	0.4	0.2	3.4
Typhus fever	0.6	0.2	0.2	0.8	0.8	1.2	1.0	1.0	1.4	1.2	1.4	0.6	10.6
Vibrio	0.2	0.0	0.2	0.4	1.0	1.0	1.8	1.6	1.4	1.4	0.8	0.2	10.8

[a] Not applicable.

[b] Previous three years average due to definition changed in 2001.

Table J. Number of Cases of Selected Notifiable Diseases by Age Group LAC, 2003

Disease	<1	1-4	5-14	15-34	35-44	45-54	55-64	65+	Total[a]
Amebiasis	1	2	12	39	27	18	16	6	121
Botulism	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	2	3	1	0	0	1	7
Campylobacteriosis	40	146	181	320	144	111	57	99	1100
Cholera	0	0	0	0	1	0	0	0	1
Coccidioidomycosis	0	0	0	9	20	22	10	12	73
Cryptosporidiosis	0	3	1	22	26	15	4	0	71
Cysticercosis	0	0	1	5	5	0	0	1	12
Dengue	0	0	0	0	0	0	0	0	0
E. *coli* O157:H7	0	4	8	6	0	4	2	3	27
Encephalitis	1	4	10	11	4	3	2	3	38
Giardiasis	5	45	92	120	50	55	24	9	401
Haemophilus influenzae type b	0	0	0	0	0	0	0	0	0
Hansen's Disease (Leprosy)	0	0	0	3	0	0	1	5	9
Hepatitis A	3	6	43	104	60	57	23	78	374
Hepatitis B	0	0	0	29	16	13	6	9	73
Hepatitis C	0	0	0	0	0	0	0	0	0
Hepatitis unspecified	0	0	0	0	0	1	0	0	1
Kawasaki syndrome	1	11	2	0	0	0	0	0	14
Legionellosis	0	0	1	3	1	4	4	8	21
Listeriosis, nonperinatal	0	0	0	1	1	2	4	9	17
Listeriosis, perinatal[b]	0	0	0	1	2	0	0	0	3
Lyme disease	0	0	1	1	1	1	2	0	6
Malaria	0	0	4	28	12	7	5	2	60
Measles	0	0	0	0	0	0	0	0	0
Meningitis, viral	85	40	288	302	92	54	18	18	899
Meningococcal infections	2	8	4	8	4	4	0	2	32
Mumps	0	1	8	1	0	0	0	0	10
Pertussis	82	8	18	12	5	3	0	2	130
Psittacosis	0	0	0	0	0	0	0	0	0
Q-fever	0	0	0	0	0	0	0	0	0
Relapsing fever	0	0	0	0	0	0	0	0	0
Rheumatic fever, acute	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0
Salmonellosis	80	177	171	220	104	91	53	98	995
Shigellosis	7	162	217	139	80	41	12	11	669
Strongyloidiasis	0	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	1	0	0	1
Trichinosis	0	0	0	0	0	0	0	0	0
Tularemia	0	0	0	0	0	0	0	1	1
Typhoid fever, case	0	1	8	2	1	3	1	0	16
Typhoid fever, carrier	0	0	0	1	1	0	0	0	2
Typhus fever	0	0	0	3	3	5	1	0	12
Vibrio	0	0	0	4	4	2	2	1	13

[a] Totals include cases with unknown age.

[b] Mother's age.

Table K. Incidence Rates of Selected Notifiable Diseases by Age Group
LAC, 2003

Disease	Age-group Rates (Cases per 100,000) [b]							
	<1	1-4	5-14	15-34	35-44	45-54	55-64	65+
Amebiasis	0.7	0.4	0.8	1.4	1.9	1.5	2.1	0.6
Botulism	-	-	-	-	-	-	-	-
Brucellosis	-	-	0.1	0.1	0.1	-	-	0.1
Campylobacteriosis	29.2	26.5	12.0	11.4	10.1	9.4	7.6	9.5
Cholera	-	-	-	-	0.1	-	-	-
Coccidioidomycosis	-	-	-	0.3	1.4	1.9	1.3	1.2
Cryptosporidiosis	-	0.5	0.1	0.8	1.8	1.3	0.5	-
Cysticercosis	-	-	0.1	0.2	0.3	-	-	0.1
Dengue	-	-	-	-	-	-	-	-
E. *coli* O157:H7	-	0.7	0.5	0.2	-	0.3	0.3	0.3
Encephalitis	0.7	0.7	0.7	0.4	0.3	0.3	0.3	0.3
Giardiasis	3.7	8.2	6.1	4.3	3.5	4.7	3.2	0.9
Haemophilus influenzae type b	-	-	-	-	-	-	-	-
Hansen's Disease (Leprosy)	-	-	-	0.1	-	-	0.1	0.5
Hepatitis A	2.2	1.1	2.9	3.7	4.2	4.8	3.1	7.5
Hepatitis B	-	-	0.0	1.0	1.1	1.1	0.8	0.9
Hepatitis C	-	-	-	-	-	-	-	-
Hepatitis unspecified	-	-	-	-	-	0.1	-	-
Kawasaki syndrome	0.7	2.0	0.1	-	-	-	-	-
Legionellosis	-	-	0.1	0.1	0.1	0.3	0.5	0.8
Listeriosis, nonperinatal	-	-	-	0.0	0.1	0.2	0.5	0.9
Listeriosis, perinatal[a]	-	-	-	0.9	8.2	-	-	-
Lyme disease	-	-	0.1	-	0.1	0.1	0.3	-
Malaria	-	-	0.3	1.0	0.8	0.6	0.7	0.2
Measles	-	-	-	-	-	-	-	-
Meningitis, viral	62.1	7.3	19.1	10.8	6.4	4.6	2.4	1.7
Meningococcal infections	1.5	1.5	0.3	0.3	0.3	0.3	-	0.2
Mumps	-	0.2	0.5	-	-	-	-	-
Pertussis	59.9	1.5	1.2	0.4	0.4	0.3	-	0.2
Psittacosis	-	-	-	-	-	-	-	-
Q-fever	-	-	-	-	-	-	-	-
Relapsing fever	-	-	-	-	-	-	-	-
Rheumatic fever, acute	-	-	-	-	-	-	-	-
Rubella	-	-	-	-	-	-	-	-
Salmonellosis	58.5	32.1	11.3	7.8	7.3	7.7	7.1	9.4
Shigellosis	5.1	29.4	14.4	4.9	5.6	3.5	1.6	1.1
Strongyloidiasis	-	-	-	-	-	-	-	-
Tetanus	-	-	-	-	-	0.1	-	-
Trichinosis	-	-	-	-	-	-	-	-
Tularemia	-	-	-	-	-	-	-	0.1
Typhoid fever, case	-	0.2	0.5	0.1	0.1	0.3	0.1	-
Typhoid fever, carrier	-	-	-	-	0.1	-	-	-
Typhus fever	-	-	-	0.1	0.2	0.4	0.1	-
Vibrio	-	-	-	0.1	0.3	0.2	0.3	0.1

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 live births.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table L. Number of Cases of Selected Notifiable Diseases by Race/Ethnicity LAC, 2003

Disease	Asian	Black	Hispanic	White	Other[a]	Unknown
Amebiasis	8	6	36	57	6	1
Botulism	0	0	0	0	0	0
Brucellosis	0	0	7	0	0	0
Campylobacteriosis	108	38	570	363	7	11
Cholera	0	0	1	0	0	0
Coccidioidomycosis	10	14	18	29	1	1
Cryptosporidiosis	2	9	36	17	2	4
Cysticercosis	1	0	11	0	0	0
Dengue	0	0	0	0	0	0
E. *coli* O157:H7	6	2	2	17	0	0
Encephalitis	2	4	15	14	1	2
Giardiasis	20	27	149	168	15	2
Haemophilus influenzae type b	0	0	0	0	0	0
Hansen's Disease (Leprosy)	1	0	8	0	0	0
Hepatitis A	46	21	111	130	6	54
Hepatitis B	16	4	25	26	0	2
Hepatitis C	0	0	0	0	0	0
Hepatitis unspecified	0	0	0	0	0	1
Kawasaki syndrome	6	0	5	2	0	1
Legionellosis	1	3	3	10	0	0
Listeriosis, nonperinatal	2	0	6	9	0	0
Listeriosis, perinatal[b]	0	0	2	1	0	0
Lyme disease	0	0	0	6	0	0
Malaria	8	22	14	16	0	0
Measles	0	0	0	0	0	0
Meningitis, viral	50	72	419	225	18	25
Meningococcal infections	2	1	19	10	0	0
Mumps	1	0	4	2	1	2
Pertussis	1	15	77	32	1	4
Psittacosis	0	0	0	0	0	0
Q-fever	0	0	0	0	0	0
Relapsing fever	0	0	0	0	0	0
Rheumatic fever, acute	0	0	0	0	0	0
Rubella	0	0	0	0	0	0
Salmonellosis	74	68	549	253	4	15
Shigellosis	14	43	487	115	4	6
Strongyloidiasis	0	0	0	0	0	0
Tetanus	0	0	1	0	0	0
Trichinosis	0	0	0	0	0	0
Tularemia	0	0	0	1	0	0
Typhoid fever, case	5	1	7	1	1	1
Typhoid fever, carrier	0	0	2	0	0	0
Typhus fever	2	1	3	6	0	0
Vibrio	4	0	7	1	0	1

[a] Other includes Native American and any additional racial group that cannot be categorized as Asian, Black, Hispanic, and White.

[b] Mother's race.

Table M. Incidence Rates of Selected Notifiable Diseases by Race/Ethnicity LAC, 2003

Disease	Race/Ethnicity Rates (Cases per 100,000) [b]			
	Asian	Black	Hispanic	White
Amebiasis	0.7	0.7	0.8	2.0
Botulism	-	-	-	-
Brucellosis	-	-	0.2	-
Campylobacteriosis	8.8	4.3	13.0	12.8
Cholera	-	-	-	-
Coccidioidomycosis	0.8	1.6	0.4	1.0
Cryptosporidiosis	0.2	1.0	0.8	0.6
Cysticercosis	0.1	-	0.3	-
Dengue	-	-	-	-
E. *coli* O157:H7	0.5	0.2	-	0.6
Encephalitis	0.2	0.5	0.3	0.5
Giardiasis	1.6	3.1	3.4	5.9
Haemophilus influenzae type b	-	-	-	-
Hansen's Disease (Leprosy)	0.1	-	0.2	-
Hepatitis A	3.7	2.4	2.5	4.6
Hepatitis B	1.3	0.5	0.6	0.9
Hepatitis C	-	-	-	-
Hepatitis unspecified	-	-	-	-
Kawasaki syndrome	0.5	-	0.1	0.1
Legionellosis	0.1	0.3	0.1	0.4
Listeriosis, nonperinatal	0.2	0.0	0.1	0.3
Listeriosis, perinatal[a]	-	-	2.2	3.9
Lyme disease	-	-	-	0.2
Malaria	0.7	2.5	0.3	0.6
Measles	-	-	-	-
Meningitis, viral	4.1	8.2	9.5	7.9
Meningococcal infections	0.2	0.1	0.4	0.4
Mumps	0.1	-	0.1	0.1
Pertussis	0.1	1.7	1.8	1.1
Psittacosis	-	-	-	-
Q-fever	-	-	-	-
Relapsing fever	-	-	-	-
Rheumatic fever, acute	-	-	-	-
Rubella	-	-	-	-
Salmonellosis	6.0	7.8	12.5	8.9
Shigellosis	1.1	4.9	11.1	4.0
Strongyloidiasis	-	-	-	-
Tetanus	-	-	-	-
Trichinosis	-	-	-	-
Tularemia	-	-	-	-
Typhoid fever, case	0.4	0.1	0.2	-
Typhoid fever, carrier	-	-	-	-
Typhus fever	0.2	0.1	0.1	0.2
Vibrio	0.3	-	0.2	-

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 live births.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table N. Number of Cases and Annual Incidence Rate of Selected Notifiable Diseases by Sex LAC, 2003

Disease	Male		Female	
	Cases	Rate (Cases per 100,000) [b]	Cases	Rate (Cases per 100,000) [b]
Amebiasis	68	1.5	53	1.1
Botulism	-	-	-	-
Brucellosis	5	0.1	2	-
Campylobacteriosis	578	12.5	522	10.9
Cholera	-	-	1	0.0
Coccidioidomycosis	63	1.4	10	0.2
Cryptosporidiosis	58	1.3	13	0.3
Cysticercosis	6	0.1	6	0.1
Dengue	-	-	-	-
E. *coli* O157:H7	9	0.2	18	0.4
Encephalitis	24	0.5	14	0.3
Giardiasis	246	5.3	154	3.2
Haemophilus influenzae type b	-	-	-	-
Hansen's Disease (Leprosy)	6	0.1	3	0.1
Hepatitis A	187	4.0	182	3.8
Hepatitis B	52	1.1	21	0.4
Hepatitis C	-	-	-	-
Hepatitis unspecified	1	0.0	0	0.0
Kawasaki syndrome	9	0.2	5	0.1
Legionellosis	12	0.3	9	0.2
Listeriosis, nonperinatal	10	0.2	7	0.1
Listeriosis, perinatal	2	2.8	1	1.4
Lyme disease	3	0.1	3	0.1
Malaria	38	0.8	22	0.5
Measles	-	-	-	-
Meningitis, viral	468	10.1	424	8.9
Meningococcal infections	17	0.4	15	0.3
Mumps	6	0.1	4	0.1
Pertussis	70	1.5	60	1.3
Psittacosis	-	-	-	-
Q-fever	-	-	-	-
Relapsing fever	-	-	-	-
Rheumatic fever, acute	-	-	-	-
Rubella	-	-	-	-
Salmonellosis	474	10.3	519	10.9
Shigellosis	364	7.9	305	6.4
Strongyloidiasis	-	-	-	-
Tetanus	1	0.0	0	-
Trichinosis	-	-	-	-
Tularemia	0	-	1	0.0
Typhoid fever, case	6	0.1	10	0.2
Typhoid fever, carrier	0	-	2	0.0
Typhus fever	7	0.2	5	0.1
Vibrio	9	0.2	4	0.1

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 live births.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-1. Selected Notifiable Diseases
SPA 1. Antelope Valley Area
LAC, 2003

Disease	Frequency	Rate (Cases per 100,000) [b]
	Antelope	Antelope
Amebiasis	1	0.3
Botulism	0	-
Brucellosis	0	-
Campylobacteriosis	30	9.0
Cholera	0	-
Coccidioidomycosis	19	5.7
Cryptosporidiosis	1	0.3
Cysticercosis	1	0.3
Dengue	0	-
E. *coli* O157:H7	0	-
Encephalitis	1	0.3
Giardiasis	7	2.1
Haemophilus influenzae type b	0	-
Hansen's Disease (Leprosy)	0	-
Hepatitis A	8	2.4
Hepatitis B	2	0.6
Hepatitis C	0	-
Hepatitis unspecified	0	-
Kawasaki syndrome	0	-
Legionellosis	1	0.3
Listeriosis, nonperinatal	1	0.3
Listeriosis, perinatal	0	-
Lyme disease	0	-
Malaria	2	0.6
Measles	0	-
Meningitis, viral	45	13.5
Meningococcal infections	1	0.3
Mumps	0	-
Pertussis	2	0.6
Psittacosis	0	-
Q-fever	0	-
Relapsing fever	0	-
Rheumatic fever, acute	0	-
Rubella	0	-
Salmonellosis	17	5.1
Shigellosis	13	3.9
Strongyloidiasis	0	-
Tetanus	0	-
Trichinosis	0	-
Tularemia	0	-
Typhoid fever, case	0	-
Typhoid fever, carrier	0	-
Typhus fever	0	-
Vibrio	0	-

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-2. Selected Notifiable Diseases
SPA 2. San Fernando Area
LAC, 2003

Disease	Frequency					Rate (Cases per 100,000) [b]				
	EV	GL	SF	WV	TOTAL	EV	GL	SF	WV	TOTAL
Amebiasis	3	19	6	12	40	0.7	5.4	1.4	1.4	1.9
Botulism	0	0	0	0	0	-	-	-	-	-
Brucellosis	0	1	1	0	2	-	0.3	0.2	-	0.1
Campylobacteriosis	38	49	59	109	255	8.5	14.0	13.6	12.5	12.1
Cholera	0	0	0	0	0	-	-	-	-	-
Coccidioidomycosis	0	3	6	17	26	-	0.9	1.4	1.9	1.2
Cryptosporidiosis	4	5	0	8	17	0.9	1.4	-	0.9	0.8
Cysticercosis	2	0	0	1	3	0.4	-	-	0.1	0.1
Dengue	0	0	0	0	0	-	-	-	-	-
E. *coli* O157:H7	1	2	1	4	8	0..2	0.6	0.2	0.5	0.4
Encephalitis	2	3	2	5	12	0.4	0.9	0.5	0.6	0.6
Giardiasis	6	35	11	53	105	1.3	10.0	2.5	6.1	5.0
Haemophilus influenzae type b	0	0	0	0	0	-	-	-	-	-
Hansen's Disease (Leprosy)	1	1	0	0	2	0.2	0.3	-	-	0.1
Hepatitis A	17	52	12	32	113	3.8	14.9	2.8	3.7	5.4
Hepatitis B	4	1	6	7	18	0.9	0.3	1.4	0.8	0.9
Hepatitis C	0	0	0	0	0	-	-	-	-	-
Hepatitis unspecified	0	0	1	0	1	-	-	0.2	-	0.0
Kawasaki syndrome	1	0	0	3	4	0.2	-	-	0.3	0.2
Legionellosis	0	3	0	4	7	-	0.9	-	0.5	0.3
Listeriosis, nonperinatal	1	1	2	3	7	0.2	0.3	0.5	0.3	0.3
Listeriosis, perinatal	0	0	0	0	0	-	-	-	-	-
Lyme disease	0	2	0	2	4	-	0.6	-	0.2	0.2
Malaria	1	3	5	9	18	0.2	0.9	1.2	1.0	0.9
Measles	0	0	0	0	0	-	-	-	-	-
Meningitis, viral	12	27	49	68	156	2.7	7.7	11.3	7.8	7.4
Meningococcal infections	1	1	3	3	8	0.2	0.3	0.7	0.3	0.4
Mumps	0	0	0	2	2	-	-	-	0.2	0.1
Pertussis	3	5	9	15	32	0.7	1.4	2.1	1.7	1.5
Psittacosis	0	0	0	0	0	-	-	-	-	-
Q-fever	0	0	0	0	0	-	-	-	-	-
Relapsing fever	0	0	0	0	0	-	-	-	-	-
Rheumatic fever, acute	0	0	0	0	0	-	-	-	-	-
Rubella	0	0	0	0	0	-	-	-	-	-
Salmonellosis	31	45	55	102	233	6.9	12.9	12.7	11.7	11.2
Shigellosis	21	19	25	61	126	4.7	5.4	5.8	7.0	6.0
Strongyloidiasis	0	0	0	0	0	-	-	-	-	-
Tetanus	0	0	0	0	0	-	-	-	-	-
Trichinosis	0	0	0	0	0	-	-	-	-	-
Tularemia	0	0	0	0	0	-	-	-	-	-
Typhoid fever, case	0	1	2	2	5	-	0.3	0.5	0.2	0.2
Typhoid fever, carrier	0	0	0	0	0	-	-	-	-	-
Typhus fever	1	2	0	1	4	0.2	0.6	-	0.1	0.2
VIbrio	0	0	1	1	2	-	-	0.2	0.1	0.1

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-3. Selected Notifiable Diseases
SPA 3. San Gabriel Area
LAC, 2003

Disease	Frequency					Rate (Cases per 100,000) [b]				
	AH	EM	FH	PO	TOTAL	AH	EM	FH	PO	TOTAL
Amebiasis	4	0	0	4	8	1.1	-	-	0.7	0.5
Botulism	0	0	0	0	0	-	-	-	-	-
Brucellosis	0	0	1	1	2	-	-	0.3	0.2	0.1
Campylobacteriosis	39	21	41	56	157	11.0	4.6	13.3	10.0	9.3
Cholera	0	0	0	0	0	-	-	-	-	-
Coccidioidomycosis	0	2	0	3	5	-	0.4	-	0.5	0.3
Cryptosporidiosis	1	1	1	2	5	0.3	0.2	0.3	0.4	0.3
Cysticercosis	0	0	2	3	5	-	-	0.6	0.5	0.3
Dengue	0	0	0	0	0	-	-	-	-	-
E. *coli* O157:H7	1	0	1	2	4	0.3	-	0.3	0.4	0.2
Encephalitis	0	1	1	2	4	-	0.2	0.3	0.4	0.2
Giardiasis	18	3	11	14	46	5.1	0.7	3.6	2.5	2.7
Haemophilus influenzae type b	0	0	0	0	0	-	-	-	-	-
Hansen's Disease (Leprosy)	0	1	1	0	2	-	0.2	0.3	-	0.1
Hepatitis A	15	4	17	12	48	4.2	0.9	5.5	2.1	2.9
Hepatitis B	3	2	0	4	9	0.8	0.4	-	0.7	0.5
Hepatitis C	0	0	0	0	0	-	-	-	-	-
Hepatitis unspecified	0	0	0	0	0	-	-	-	-	-
Kawasaki syndrome	2	0	1	0	3	0.6	-	0.3	-	0.2
Legionellosis	0	0	0	1	1	-	-	-	0.2	0.1
Listeriosis, nonperinatal	0	0	3	0	3	-	-	1.0	-	0.2
Listeriosis, perinatal	0	0	0	1	1	-	-	-	0.8	0.3
Lyme disease	0	0	0	0	0	-	-	-	-	-
Malaria	0	0	3	3	6	-	-	1.0	0.5	0.4
Measles	0	0	0	0	0	-	-	-	-	-
Meningitis, viral	52	21	53	66	192	14.7	4.6	17.2	11.8	11.4
Meningococcal infections	1	1	3	1	6	0.3	0.2	1.0	0.2	0.4
Mumps	1	0	0	2	3	0.3	-	-	0.4	0.2
Pertussis	2	0	3	7	12	0.6	-	1.0	1.3	0.7
Psittacosis	0	0	0	0	0	-	-	-	-	-
Q-fever	0	0	0	0	0	-	-	-	-	-
Relapsing fever	0	0	0	0	0	-	-	-	-	-
Rheumatic fever, acute	0	0	0	0	0	-	-	-	-	-
Rubella	0	0	0	0	0	-	-	-	-	-
Salmonellosis	39	17	40	49	145	11.0	3.7	13.0	8.8	8.6
Shigellosis	11	5	11	14	41	3.1	1.1	3.6	2.5	2.4
Strongyloidiasis	0	0	0	0	0	-	-	-	-	-
Tetanus	0	0	0	1	1	-	-	-	0.2	0.1
Trichinosis	0	0	0	0	0	-	-	-	-	-
Tularemia	0	0	0	0	0	-	-	-	-	-
Typhoid fever, case	0	0	0	0	0	-	-	-	-	-
Typhoid fever, carrier	0	0	0	0	0	-	-	-	-	-
Typhus fever	3	0	5	0	8	0.8	-	1.6	-	0.5
Vibrio	2	0	1	0	3	0.6	-	0.3	-	0.2

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-4. Selected Notifiable Diseases
SPA 4. Metro Area
LAC, 2003

Disease	Frequency				Rate (Cases per 100,000) [b]			
	CE	HW	NE	TOTAL	CE	HW	NE	TOTAL
Amebiasis	4	12	4	20	1.2	2.3	1.2	1.7
Botulism	0	0	0	0	-	-	-	-
Brucellosis	1	0	0	1	0.3	-	-	0.1
Campylobacteriosis	48	49	43	140	14.0	9.4	13.4	11.8
Cholera	1	0	0	1	0.3	-	-	0.1
Coccidioidomycosis	4	2	1	7	1.2	0.4	0.3	0.6
Cryptosporidiosis	8	22	1	31	2.3	4.2	0.3	2.6
Cysticercosis	0	0	0	0	-	-	-	-
Dengue	0	0	0	0	-	-	-	-
E. *coli* O157:H7	0	1	0	1	-	0.2	-	0.1
Encephalitis	3	0	1	4	0.9	-	0.3	0.3
Giardiasis	12	33	13	58	3.5	6.3	4.0	4.9
Haemophilus influenzae type b	0	0	0	0	-	-	-	-
Hansen's Disease (Leprosy)	0	0	1	1	-	-	0.3	0.1
Hepatitis A	25	27	15	67	7.3	5.2	4.7	5.6
Hepatitis B	4	13	1	18	1.2	2.5	0.3	1.5
Hepatitis C	0	0	0	0	-	-	-	-
Hepatitis unspecified	0	0	0	0	-	-	-	-
Kawasaki syndrome	1	2	0	3	0.3	0.4	-	0.3
Legionellosis	0	2	0	2	-	0.4	-	0.2
Listeriosis, nonperinatal	0	2	0	2	-	0.4	-	0.2
Listeriosis, perinatal	0	1	0	1	-	0.8	-	0.4
Lyme disease	0	0	0	0	-	-	-	-
Malaria	0	4	2	6	-	0.8	0.6	0.5
Measles	0	0	0	0	-	-	-	-
Meningitis, viral	9	22	18	49	2.6	4.2	5.6	4.1
Meningococcal infections	1	1	0	2	0.3	0.2	-	0.2
Mumps	0	1	0	1	-	0.2	-	0.1
Pertussis	4	5	5	14	1.2	1.0	1.6	1.2
Psittacosis	0	0	0	0	-	-	-	-
Q-fever	0	0	0	0	-	-	-	-
Relapsing fever	0	0	0	0	-	-	-	-
Rheumatic fever, acute	0	0	0	0	-	-	-	-
Rubella	0	0	0	0	-	-	-	-
Salmonellosis	30	44	46	120	8.8	8.4	14.3	10.1
Shigellosis	51	70	25	146	14.9	13.4	7.8	12.3
Strongyloidiasis	0	0	0	0	-	-	-	-
Tetanus	0	0	0	0	-	-	-	-
Trichinosis	0	0	0	0	-	-	-	-
Tularemia	0	0	0	0	-	-	-	-
Typhoid fever, case	0	0	0	0	-	-	-	-
Typhoid fever, carrier	1	0	0	1	0.3	-	-	0.1
Typhus fever	0	0	0	0	-	-	-	-
Vibrio	0	2	0	2	-	0.4	-	0.2

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-5. Selected Notifiable Diseases
SPA 5. West Area
LAC, 2003

Disease	Frequency	Rate (Cases per 100,000) [b]
	West	West
Amebiasis	14	2.2
Botulism	0	-
Brucellosis	1	0.2
Campylobacteriosis	110	17.0
Cholera	0	-
Coccidioidomycosis	1	0.2
Cryptosporidiosis	7	1.1
Cysticercosis	0	-
Dengue	0	-
E. *coli* O157:H7	4	0.6
Encephalitis	3	0.5
Giardiasis	61	9.4
Haemophilus influenzae type b	0	-
Hansen's Disease (Leprosy)	0	-
Hepatitis A	18	2.8
Hepatitis B	2	0.3
Hepatitis C	0	-
Hepatitis unspecified	0	-
Kawasaki syndrome	0	-
Legionellosis	1	0.2
Listeriosis, nonperinatal	2	0.3
Listeriosis, perinatal	1	0.6
Lyme disease	2	0.3
Malaria	3	0.5
Measles	0	-
Meningitis, viral	42	6.5
Meningococcal infections	4	0.6
Mumps	1	0.2
Pertussis	9	1.4
Psittacosis	0	-
Q-fever	0	-
Relapsing fever	0	-
Rheumatic fever, acute	0	-
Rubella	0	-
Salmonellosis	73	11.3
Shigellosis	44	6.8
Strongyloidiasis	0	-
Tetanus	0	-
Trichinosis	0	-
Tularemia	0	-
Typhoid fever, case	0	-
Typhoid fever, carrier	0	-
Typhus fever	0	-
Vibrio	0	-

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-6. Selected Notifiable Diseases
SPA 6. South Area
LAC, 2003

Disease	Frequency					Rate (Cases per 100,000) [b]				
	CN	SO	SE	SW	TOTAL	CN	SO	SE	SW	TOTAL
Amebiasis	2	2	2	3	9	0.7	1.1	1.2	0.8	0.9
Botulism	0	0	0	0	0	-	-	-	-	-
Brucellosis	0	0	0	0	0	-	-	-	-	-
Campylobacteriosis	24	9	32	39	104	8.4	5.1	19.3	10.4	10.4
Cholera	0	0	0	0	0	-	-	-	-	-
Coccidioidomycosis	2	1	0	2	5	0.7	0.6	-	0.5	0.5
Cryptosporidiosis	1	1	0	3	5	0.3	0.6	-	0.8	0.5
Cysticercosis	0	0	0	0	0	-	-	-	-	-
Dengue	0	0	0	0	0	-	-	-	-	-
E. *coli* O157:H7	0	0	0	2	2	-	-	-	0.5	0.2
Encephalitis	0	1	1	2	4	-	0.6	0.6	0.5	0.4
Giardiasis	7	3	11	15	36	2.4	1.7	6.6	4.0	3.6
Haemophilus influenzae type b	0	0	0	0	0	-	-	-	-	-
Hansen's Disease (Leprosy)	1	0	0	0	1	0.3	-	-	-	0.1
Hepatitis A	12	3	3	13	31	4.2	1.7	1.8	3.5	3.1
Hepatitis B	0	1	2	2	5	0.0	0.6	1.2	0.5	0.5
Hepatitis C	0	0	0	0	0	-	-	-	-	-
Hepatitis unspecified	0	0	0	0	0	-	-	-	-	-
Kawasaki syndrome	0	0	0	0	0	-	-	-	-	-
Legionellosis	2	1	0	0	3	0.7	0.6	-	-	0.3
Listeriosis, nonperinatal	0	0	0	0	0	-	-	-	-	-
Listeriosis, perinatal	0	0	0	0	0	-	-	-	-	-
Lyme disease	0	0	0	0	0	-	-	-	-	-
Malaria	0	0	1	6	7	-	-	0.6	1.6	0.7
Measles	0	0	0	0	0	-	-	-	-	-
Meningitis, viral	52	15	20	24	111	18.2	8.5	12.1	6.4	11.1
Meningococcal infections	0	1	0	1	2	-	0.6	-	0.3	0.2
Mumps	0	0	0	0	0	-	-	-	-	-
Pertussis	8	6	10	10	34	2.8	3.4	6.0	2.7	3.4
Psittacosis	0	0	0	0	0	-	-	-	-	-
Q-fever	0	0	0	0	0	-	-	-	-	-
Relapsing fever	0	0	0	0	0	-	-	-	-	-
Rheumatic fever, acute	0	0	0	0	0	-	-	-	-	-
Rubella	0	0	0	0	0	-	-	-	-	-
Salmonellosis	36	14	19	34	103	12.6	8.0	11.5	9.0	10.3
Shigellosis	33	21	28	47	129	11.5	11.9	16.9	12.5	12.8
Strongyloidiasis	0	0	0	0	0	-	-	-	-	-
Tetanus	0	0	0	0	0	-	-	-	-	-
Trichinosis	0	0	0	0	0	-	-	-	-	-
Tularemia	0	0	0	0	0	-	-	-	-	-
Typhoid fever, case	0	1	0	3	4	-	0.6	-	0.8	0.4
Typhoid fever, carrier	0	0	0	0	0	-	-	-	-	-
Typhus fever	0	0	0	0	0	-	-	-	-	-
Vlbrio	0	0	2	0	2	-	-	1.2	-	0.2

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-7. Selected Notifiable Diseases
SPA 7. East Area
LAC, 2003

Disease	Frequency					Rate (Cases per 100,000) [b]				
	BF	EL	SA	WH	TOTAL	BF	EL	SA	WH	TOTAL
Amebiasis	6	3	2	2	13	1.6	1.4	0.4	0.6	1.0
Botulism	0	0	0	0	0	-	-	-	-	-
Brucellosis	0	1	0	0	1	-	0.5	-	-	0.1
Campylobacteriosis	46	34	53	23	156	12.6	15.9	11.9	7.1	11.5
Cholera	0	0	0	0	0	-	-	-	-	-
Coccidioidomycosis	0	2	0	2	4	-	0.9	0.0	0.6	0.3
Cryptosporidiosis	1	0	3	1	5	0.3	-	0.7	0.3	0.4
Cysticercosis	1	0	0	0	1	0.3	-	-	-	0.1
Dengue	0	0	0	0	0	-	-	-	-	-
E. *coli* O157:H7	1	0	0	0	1	0.3	-	-	-	0.1
Encephalitis	1	0	1	2	4	0.3	-	0.2	0.6	0.3
Giardiasis	5	8	20	5	38	1.4	3.7	4.5	1.5	2.8
Haemophilus influenzae type b	0	0	0	0	0	-	-	-	-	-
Hansen's Disease (Leprosy)	0	0	2	0	2	-	-	0.4	-	0.1
Hepatitis A	10	8	14	13	45	2.7	3.7	3.1	4.0	3.3
Hepatitis B	1	1	3	3	8	0.3	0.5	0.7	0.9	0.6
Hepatitis C	0	0	0	0	0	-	-	-	-	-
Hepatitis unspecified	0	0	0	0	0	-	-	-	-	-
Kawasaki syndrome	0	1	0	1	2	-	0.5	-	0.3	0.1
Legionellosis	0	0	1	0	1	-	-	0.2	-	0.1
Listeriosis, nonperinatal	0	0	0	1	1	-	-	-	0.3	0.1
Listeriosis, perinatal	0	0	0	0	0	-	-	-	-	-
Lyme disease	0	0	0	0	0	-	-	-	-	-
Malaria	0	0	1	2	3	-	-	0.2	0.6	0.2
Measles	0	0	0	0	0	-	-	-	-	-
Meningitis, viral	43	23	65	43	174	11.7	10.7	14.6	13.2	12.9
Meningococcal infections	2	2	2	0	6	0.5	0.9	0.4	-	0.4
Mumps	1	0	1	0	2	0.3	-	0.2	-	0.1
Pertussis	3	0	1	2	6	0.8	-	0.2	0.6	0.4
Psittacosis	0	0	0	0	0	-	-	-	-	-
Q-fever	0	0	0	0	0	-	-	-	-	-
Relapsing fever	0	0	0	0	0	-	-	-	-	-
Rheumatic fever, acute	0	0	0	0	0	-	-	-	-	-
Rubella	0	0	0	0	0	-	-	-	-	-
Salmonellosis	34	47	62	39	182	9.3	22.0	13.9	12.0	13.5
Shigellosis	23	19	37	43	122	6.3	8.9	8.3	13.2	9.0
Strongyloidiasis	0	0	0	0	0	-	-	-	-	-
Tetanus	0	0	0	0	0	-	-	-	-	-
Trichinosis	0	0	0	0	0	-	-	-	-	-
Tularemia	0	0	0	1	1	-	-	-	0.3	0.1
Typhoid fever, case	1	0	3	0	4	0.3	-	0.7	-	0.3
Typhoid fever, carrier	0	0	1	0	1	-	-	0.2	-	0.1
Typhus fever	0	0	0	0	0	-	-	-	-	-
Vlbrio	1	0	0	1	2	0.3	-	-	0.3	0.1

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

Table O-8. Selected Notifiable Diseases
SPA 8. South Bay Area
LAC, 2003

Disease	Frequency				Rate (Cases per 100,000) [b]			
	HB	IW	TO	TOTAL	HB	IW	TO	TOTAL
Amebiasis	8	3	3	14	3.9	0.7	0.7	1.3
Botulism	0	0	0	0	-	-	-	-
Brucellosis	0	0	0	0	-	-	-	-
Campylobacteriosis	23	56	67	146	11.3	13.1	14.6	13.4
Cholera	0	0	0	0	-	-	-	-
Coccidioidomycosis	2	0	4	6	1.0	-	0.9	0.6
Cryptosporidiosis	0	0	0	0	-	-	-	-
Cysticercosis	1	0	0	1	0.5	-	-	0.1
Dengue	0	0	0	0	-	-	-	-
E. *coli* O157:H7	2	0	5	7	1.0	-	1.1	0.6
Encephalitis	2	2	0	4	1.0	0.5	-	0.4
Giardiasis	9	13	19	41	4.4	3.0	4.1	3.8
Haemophilus influenzae type b	0	0	0	0	-	-	-	-
Hansen's Disease (Leprosy)	0	1	0	1	-	0.2	-	0.1
Hepatitis A	5	21	17	43	2.4	4.9	3.7	3.9
Hepatitis B	1	8	2	11	0.5	1.9	0.4	1.0
Hepatitis C	0	0	0	0	-	-	-	-
Hepatitis unspecified	0	0	0	0	-	-	-	-
Kawasaki syndrome	0	0	2	2	-	-	0.4	0.2
Legionellosis	0	0	1	1	-	-	0.2	0.1
Listeriosis, nonperinatal	0	0	1	1	-	-	0.2	0.1
Listeriosis, perinatal	0	0	0	0	-	-	-	-
Lyme disease	0	0	0	0	-	-	-	-
Malaria	2	8	5	15	1.0	1.9	1.1	1.4
Measles	0	0	0	0	-	-	-	-
Meningitis, viral	27	34	51	112	13.2	8.0	11.1	10.3
Meningococcal infections	1	1	1	3	0.5	0.2	0.2	0.3
Mumps	0	1	0	1	-	0.2	-	0.1
Pertussis	4	8	9	21	2.0	1.9	2.0	1.9
Psittacosis	0	0	0	0	-	-	-	-
Q-fever	0	0	0	0	-	-	-	-
Relapsing fever	0	0	0	0	-	-	-	-
Rheumatic fever, acute	0	0	0	0	-	-	-	-
Rubella	0	0	0	0	-	-	-	-
Salmonellosis	27	45	34	106	13.2	10.5	7.4	9.7
Shigellosis	7	29	12	48	3.4	6.8	2.6	4.4
Strongyloidiasis	0	0	0	0	-	-	-	-
Tetanus	0	0	0	0	-	-	-	-
Trichinosis	0	0	0	0	-	-	-	-
Tularemia	0	0	0	0	-	-	-	-
Typhoid fever, case	0	2	1	3	-	0.5	0.2	0.3
Typhoid fever, carrier	0	0	0	0	-	-	-	-
Typhus fever	0	0	0	0	-	-	-	-
Vibrio	0	2	0	2	-	0.5	-	0.2

[a] Rates for perinatal listeriosis were calculated as cases per 100,000 women aged 15 to 44 years.

[b] Rates of disease based on less than 20 cases or events are considered "unreliable." A zero rate made from no events is especially hazardous and are not reported here, except with a dash ("-"). Conclusions drawn from unreliable rates should be made with caution, if they are to be made at all.

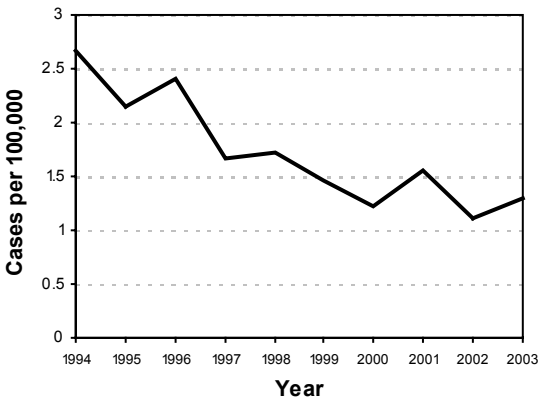
DISEASE SUMMARIES
2003

AMEBIASIS

CRUDE DATA	
Number of Cases	121
Annual Incidence[a]	
LA County	1.29
United States	N/A
Age at Diagnosis	
Mean	36
Median	38
Range	0–78 years
Case Fatality	
LA County	0.8%
United States	N/A

[a] Cases per 100,000 population.

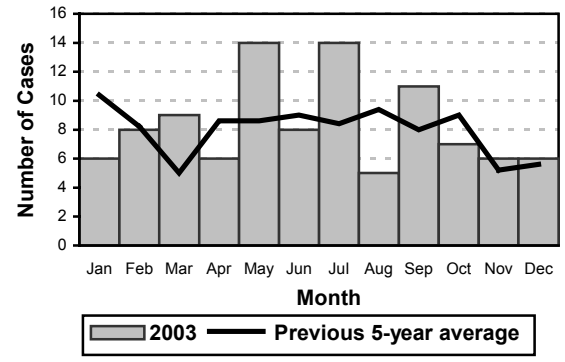
Figure 1
Amebiasis
Incidence Rates by Year
LAC, 1994–2003



DESCRIPTION

Amebiasis is caused by the protozoan parasite *Entamoeba histolytica*. Cysts shed in human feces may contaminate food or drinking water or be transferred sexually, on hands, or fomites. Incubation period is 1-4 weeks. Recreational waters such as lakes and pools may also serve as transmission vehicles, since cysts are relatively chlorine-resistant. While intestinal disease is often asymptomatic, symptoms may range from acute abdominal pain, fever, chills, and bloody diarrhea to mild abdominal discomfort with diarrhea alternating with constipation. Extraintestinal infection occurs when organisms become bloodborne, leading to amebic abscesses in the liver, lungs or brain. Complications include colonic perforation. There is no vaccine. The most commonly ordered parasite test (microscopy of stool for ova and parasites) cannot distinguish *E. histolytica* from *E. dispar*, a non-pathogenic amebic species

Figure 2
Amebiasis
Cases by Month of Onset
LAC, 2003



DISEASE ABSTRACT

- Amebiasis incidence has decreased substantially over the past 10 years—however, in 2003 the rate increased slightly from last year (1.11 to 1.29 per 100,000).
- Decreasing numbers of refugees and immigrants from endemic regions or a reduction in testing may account for the decrease in cases.
- No amebiasis outbreaks were reported during 2003.

STRATIFIED DATA

Trends: In 2003, amebiasis incidence increased slightly after an all time low in 2002 (Figure 1).

Seasonality: Amebiasis incidence usually peaks during the summer months. In 2003, the greatest number of cases occurred in May and July (Figure 2).

Age: While amebiasis is ubiquitous, it is a disease more often contracted among young adults (Figure 3). More than half of the cases occurring in LAC during 2003 were among those aged 15–44 (n=66, 55%). Amebiasis is rare among those below age 5 and especially rare among those below age 2—dysentery in infants is typically due to shigellae.

Sex: Males continue to be more likely to contract amebiasis than females (1.3:1) possibly due to MSM.

Race/Ethnicity: In 2003, Whites had the highest rates, while the rates for Asians, Blacks and Latinos were almost equal (Figure 4). This is different from 2002, which had no Asian or Black cases and Latinos and Whites had similar rates.

Location: Four SPAs had rates greater than the county mean rate: SPA 2 (1.9 per 100,00), SPA 4 (1.7), SPA 5 (2.2) and SPA 8 (1.3).

Figure 3
Amebiasis
Number of Cases by Age Group
LAC, 2003

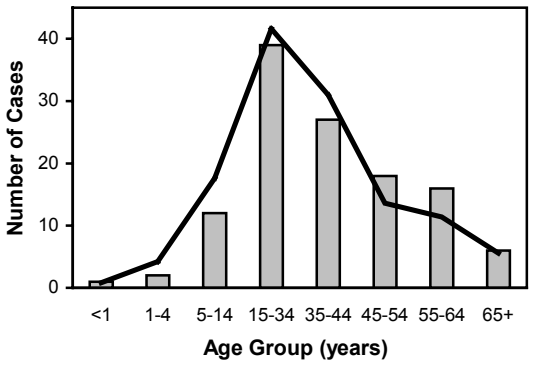
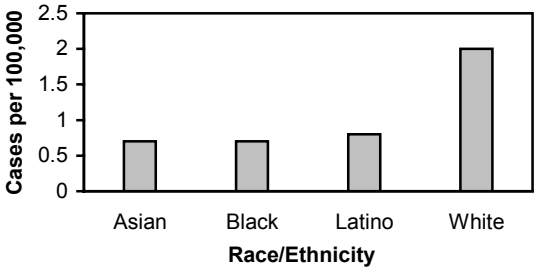


Figure 4
Amebiasis
Incidence Rates by Race/Ethnicity
LAC, 2003



COMMENTS

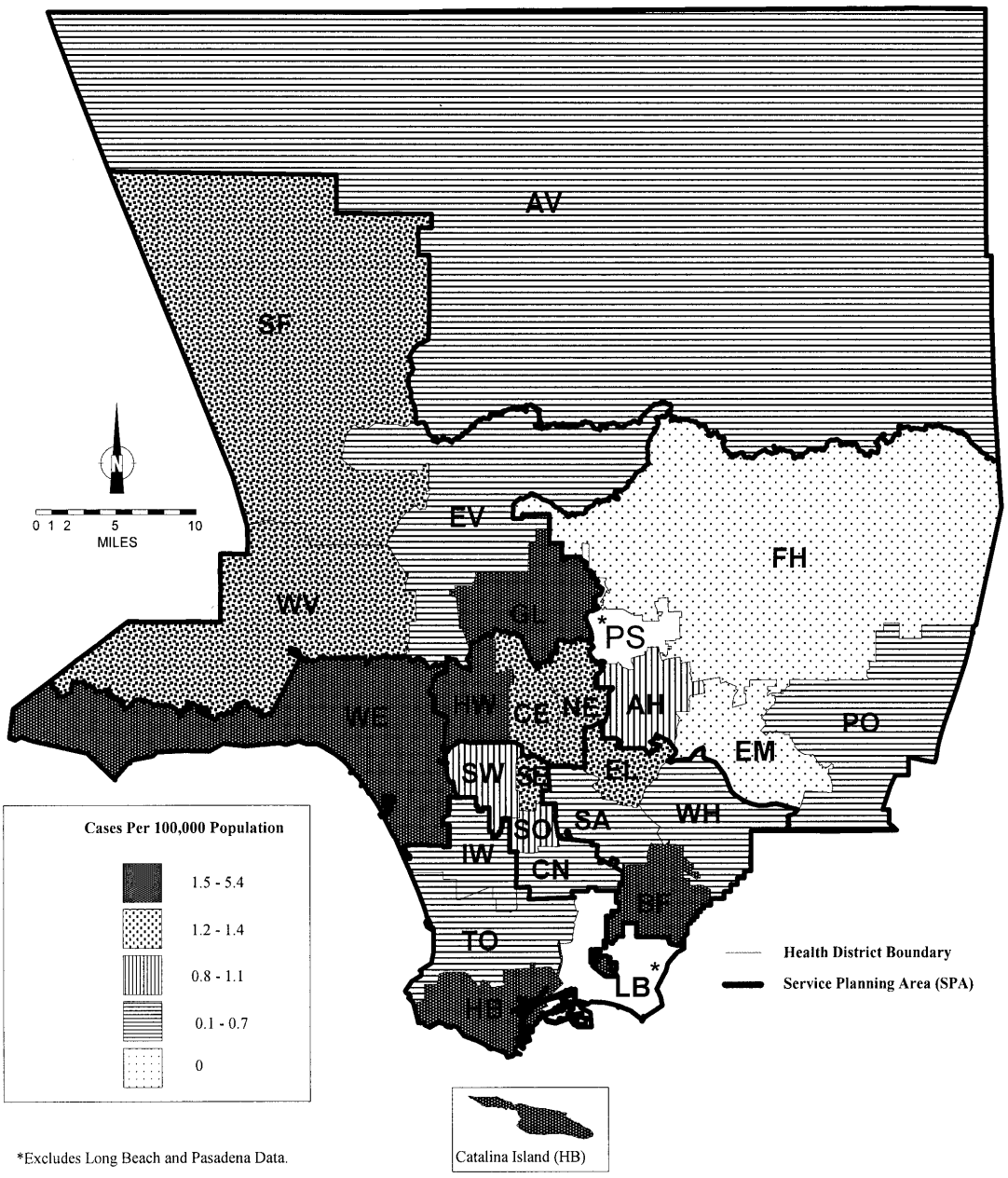
Amebiasis is no longer nationally reportable, so there are no current national rates for comparison. The disease remains reportable in California because a large proportion of the population travels to endemic countries in Asia and Central America. The impact of new tests that distinguish *E. histolytica* from *E. dispar* is unknown since such tests are rarely ordered. It is believed that many reported amebiasis cases are actually not infected with pathogenic *E. histolytica*.

ADDITIONAL RESOURCES

Amebiasis - Health Information for International Travel:
www.cdc.gov/travel/diseases/amebiasis.htm

More CDC Information on Amebiasis:
www.cdc.gov/ncidod/dpd/parasites/amebiasis/default.htm

MAP 1. Amebiasis
Rates by Health District, Los Angeles County, 2003*

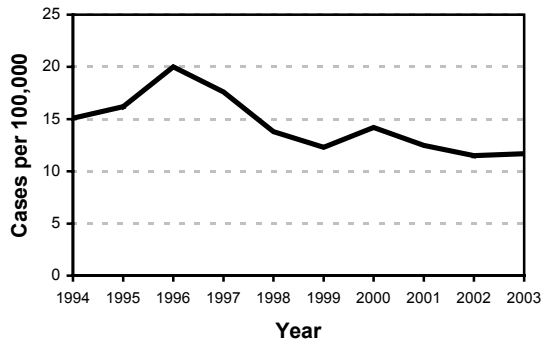


CAMPYLOBACTERIOSIS

CRUDE DATA	
Number of Cases	1,100
Annual Incidence[a]	
LA County	11.70
United States	N/A
Age at Diagnosis	
Mean	29
Median	27
Range	0–94
Case Fatality	
LA County	<1%
United States	

[a] Cases per 100,000 population.

Figure 1
Campylobacteriosis
Incidence Rates by Year of Onset
LAC, 1994–2003



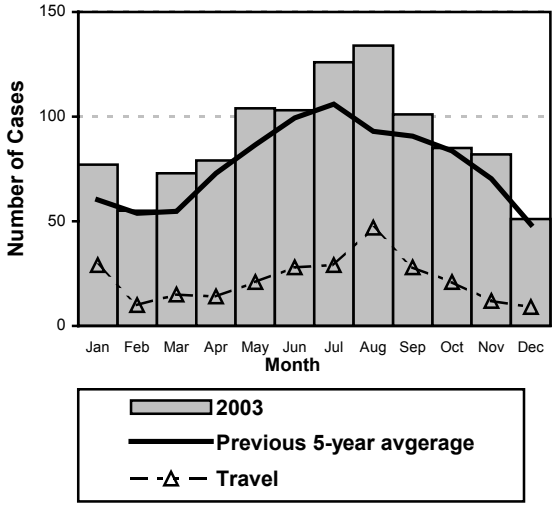
DESCRIPTION

Campylobacteriosis is a bacterial disease caused by gram-negative bacilli transmitted through ingestion of organisms via consumption of undercooked poultry or other meat, contaminated food, water or raw milk, or contact with infected animals. The incubation period is 2-5 days. Common symptoms include watery or bloody diarrhea, fever, abdominal cramps, myalgia, and nausea. Species include *C. jejuni, C. upsaliensis, C. coli* and *C. fetus*. Sequelae include Guillain-Barré syndrome and Reiter syndrome, which occur in a limited number of cases.

DISEASE ABSTRACT

- The campylobacteriosis rate in LAC remained stable after a downward trend.
- In 2003, overall age-adjusted rates were highest for Whites.

Figure 2
Campylobacteriosis
Cases and Travel History by
Month of Onset
LAC, 2003



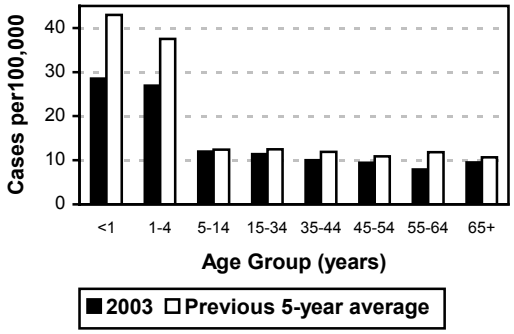
STRATIFIED DATA

Trends: After a downward trend in rates since 1996 (Figure 1), the rate remained relatively stable from 2002 to 2003.

Seasonality: As in previous years, the number of cases increased in the spring and summer. Peaks in the number of cases may be associated with the increase in travel during those months. In 2003, incidence peaked in August (Figure 2).

Age: The highest rates continued to be among infants aged <1 year and children, aged 1-4 years (Figure 3). These age groups had significantly higher rates than any other age group but the rates were lower than the previous five-year average. In developed countries, children younger than five years and young adults have the highest incidence of this disease.

Figure 3
Campylobacteriosis
Incidence Rates by Age Group
LAC, 2003



Sex: The male-to-female ratio was 1.1:1. The preponderance of males is typical and the reason for this is not known [1].

Race/Ethnicity: In 2003, Latinos and Whites again had similar crude rates in spite of there being 58% more reported cases in Latinos. Latino infants continued to have higher age-adjusted rates compared to other race/ethnicities (Figure 4), however, in 2003, rates in Asian infants increased. The highest age-adjusted rate was in Whites (13.4 cases per 100,000 population) followed by Latinos (12.2), Asians (8.9) and Blacks (4.4).

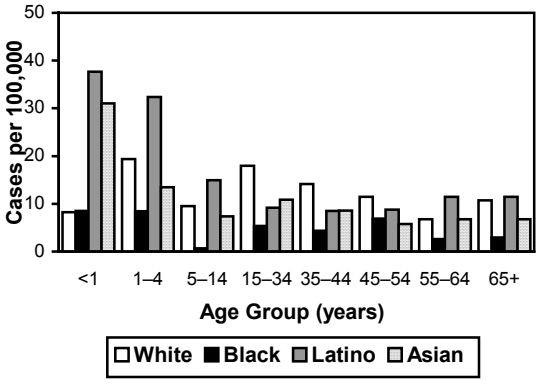
Location: SPA 2 again had the highest number of cases at 255 (12 per 100,000), and SPA 5 had the highest rate with 17 per 100,000 (N= 110). The higher rate in SPA 5 is consistent with previous years and is significantly higher than the county average.

Severity of Illness: Thirteen percent of campylobacteriosis cases (N=143) were hospitalized for at least two days. One campylobacteriosis-associated death occurred in a 78 year-old patient with multiple medical problems. There were two reports of Guillain-Barré syndrome (GBS) subsequent to a campylobacteriosis diagnosis. One case of GBS was in a woman visiting from Mexico. Based on her onset and history, she was most likely infected in Mexico.

PREVENTION

To reduce the likelihood of contracting campylobacteriosis, all food derived from animal sources should be thoroughly cooked, particularly poultry. Cross contamination may be avoided by making sure utensils, counter tops, cutting boards and sponges are cleaned or do not come in contact with raw poultry or meat or their juices. Hands should be thoroughly washed before, during and after food preparation. The fluids from raw poultry or meat should not be allowed to drip on other foods in the refrigerator or in the shopping cart. It is especially important to wash hands and avoid cross contamination of infant foods, bottles and eating utensils. It is recommended to consume only pasteurized milk, milk products or juices. In addition, it is important to wash hands after coming in contact with any animal or its environment.

Figure 4
Campylobacteriosis Incidence Rates by
Age Group and Race/Ethnicity
LAC, 2003 (N=1077)



COMMENTS

In 2003, 266 cases (24%) reported travel during the incubation period. Of these, 36% traveled within the US. Mexico was the most commonly named (52%) travel destination outside the US. Visiting countries where food safety is questionable may increase risk of campylobacteriosis. Travel may also be associated with eating in restaurants more often which can be a risk factor for this disease.

There were no identified campylobacteriosis outbreaks in 2003. Eating at restaurants serving ethnic dishes consisting of intentionally undercooked or raw meat was a risk factor for three sporadic cases. Eating fresh cheese or cheese brought from Mexico was a risk factor for thirteen sporadic cases.

REFERENCES

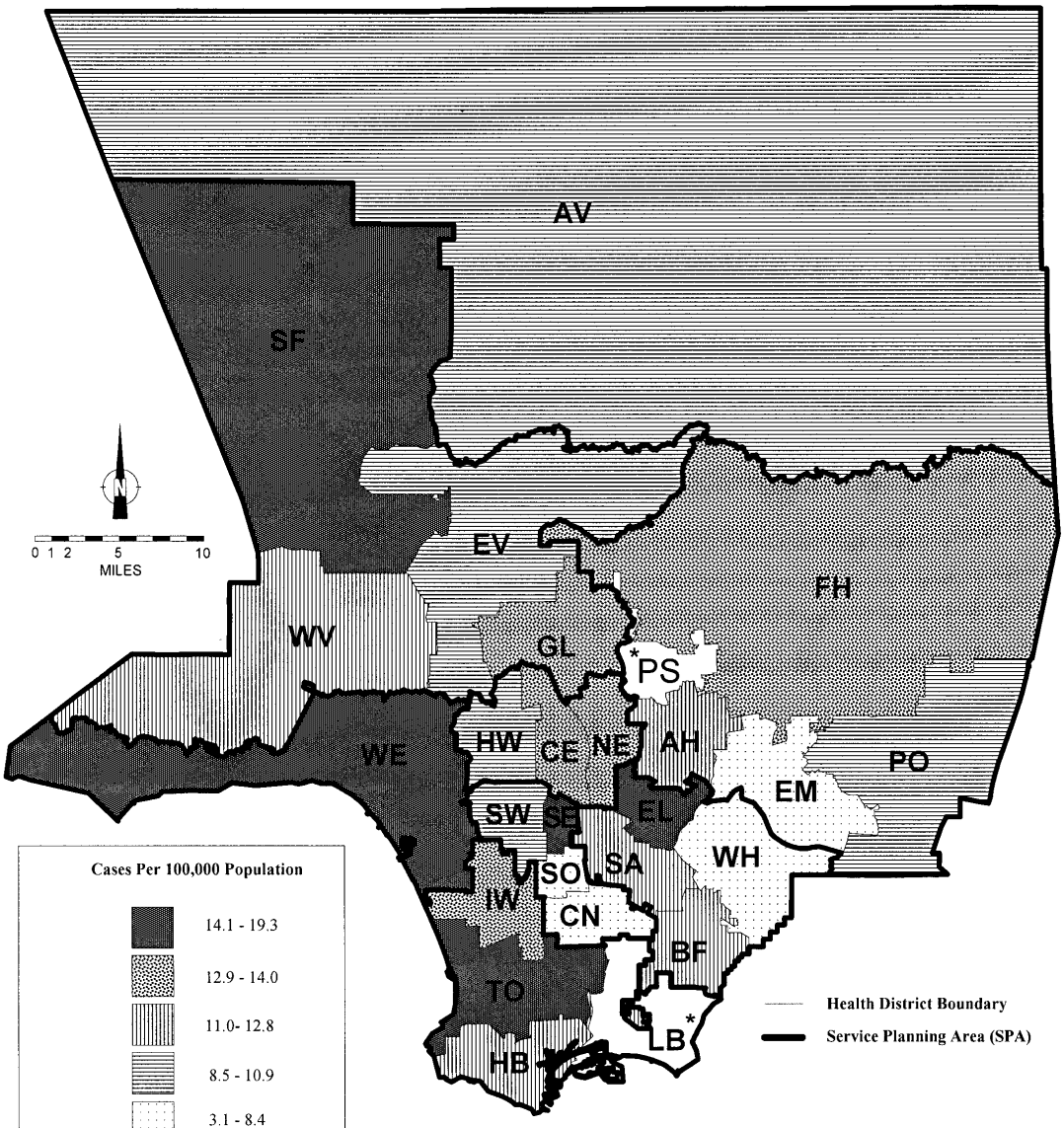
1. Allos, B.M. Campylobacter jejuni infections: update on emerging issues and trends. Clinical Infectious Diseases 2001;32:1201-6.

ADDITIONAL RESOURCES

Disease information is available from the CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/campylobacter_g.htm

General information and reporting information about this and other foodborne diseases in LAC is available at: www.lapublichealth.org/acd/food.htm

MAP 2. Campylobacteriosis
Rates by Health District, Los Angeles County, 2003*



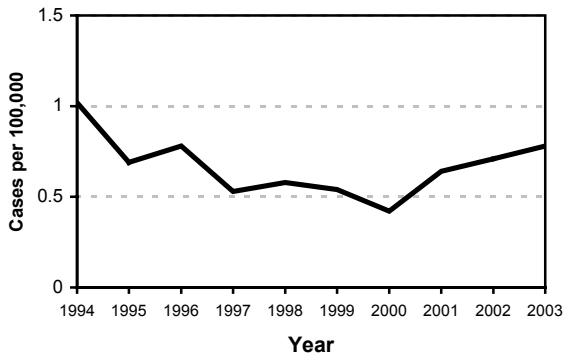
*Excludes Long Beach and Pasadena Data.

COCCIDIOIDOMYCOSIS

CRUDE DATA	
Number of Cases	73
Annual Incidence[a]	
LA County	0.78
California[b]	5.97
United States	1.69
Age at Diagnosis	
Mean	49
Median	47
Range	18–83 years
Case Fatality	
LA County	12%
United States	N/A

[a] Cases per 100,000 population.
[b] California DHS Surveillance and Statistics Section.

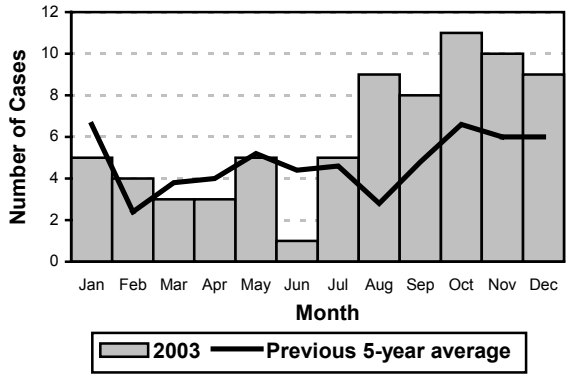
Figure 1
Coccidioidomycosis
Incidence Rates by Year of Onset
LAC, 1994–2003



DESCRIPTION

Coccidioidomycosis, or "Valley Fever," is a common fungal disease transmitted through the inhalation of infective spores from *Coccidiodes immitis* that are carried in dust. Environmental conditions conducive to an increased occurrence of coccidioidomycosis are as follows: arid to semi-arid regions, dust storms, lower altitude, hotter summers, warmer winters, and sandy, alkaline soils. It is endemic in the southwestern US and parts of Mexico and South America. Southern California is a known endemic area.

Figure 2
Coccidioidomycosis
by Month of Onset
LAC, 2003 (N=73)



Most infected individuals exhibit no symptoms or have a mild respiratory illness, but a few individuals develop a severe illness such as pneumonia, meningitis, or dissemination when the fungus spreads to many parts of the body. Because of the wide range of clinical presentations, only the most severe cases are usually reported to the health department. Laboratory diagnosis is made by demonstrating the fungus with microscopic examination or culture or by serologic testing. Blacks, Latinos, Native Americans, Filipinos, males, pregnant women, the very young (<5 years), elderly, and immunocompromised individuals are at high risk for severe disease.

DISEASE ABSTRACT

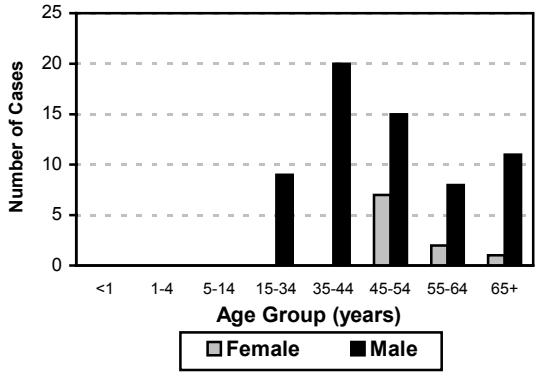
- The incidence rate for coccidioidomycosis has been increasing since 2000, which was at its lowest point in 10 years in LAC.
- Increase of cases in the last 5 months of 2003
- Cost in terms of disease severity and hospitalization was substantial. The case fatality rate was higher and the incidence of coccidioidomycosis was greater than last year. Adults, males, Blacks, and residents of the West Valley and Antelope Valley are at higher risk for disease.

STRATIFIED DATA

Trends: The incidence rate was 0.78 cases per 100,000 population for 2003 which was higher than last year (Figure 1).

Seasonality: The highest number of cases per month was observed in the latter half of the year. The number of cases per month in the last five months of 2003 was well above the previous five-year average (Figure 2). Comparing cases from August to December 2003 to a 5-year previous average of cases for the same time period, LAC observed an increase of 79% in 2003 (47 vs. 26.2 cases). Climate conditions most likely contributed to the increase of cases. Cases commonly occur in the summer after a rainy winter or spring, especially after wind and dust storms.

Figure 3
Coccidioidomycosis
Incidence by Age and Sex
LAC, 2003 (N=73)

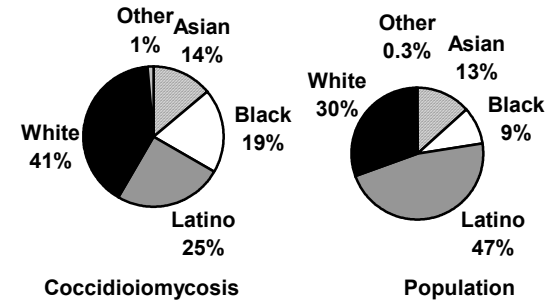


Age: For 2003, males once again have the highest incidence in all age groups. The greatest numbers of cases reported were in persons aged 45-54 years (Figure 3). The youngest case was 18 years of age.

Sex: The male-to-female rate ratio was 6.5:1. The mean age for males was 48 years and for females it was 55 (Figure 3). The gender difference is likely due to occupational and recreational dust exposure of males although this is not clearly evident from the information collected. No female cases reported being pregnant. Of the 56 cases reporting occupation, the most commonly reported occupation was construction (16%).

Race/Ethnicity: The highest incidence rate of 3.52 cases per 100,000 population was in the Other category which includes Native Americans followed by Blacks with a rate of 1.60 although these rates are unstable due to small numbers (1 Native American case and 14 Black cases). Latinos and Whites had the greatest number of cases with 18 and 29, respectively (Figure 4).

Figure 4
Coccidioidomycosis
Percent Cases by Race/Ethnicity
LAC, 2003

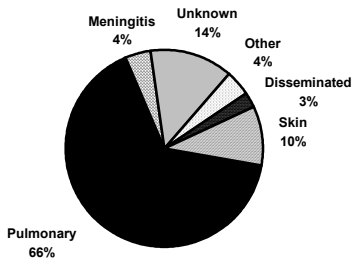


Location: Antelope Valley (n=19) and West Valley (n=17) districts had the highest number of cases reported.

Travel: 21 cases reported travel within four weeks before onset of illness: 12 traveled within California (San Fernando Valley, Central Valley and adjacent counties, Riverside County, Imperial County near San Diego) and 9 traveled outside California to Arizona, Nevada, Mexico, Italy and Vietnam. The fungus is known to be endemic in most of these areas. Four cases were incarcerated in areas of high endemicity.

Underlying Disease: Of 17 cases known to have underlying disease, 8 cases were diabetic, 2 had malignancies (1 also was a bone marrow transplant recipient), 1 had HIV, and 6 had other diagnoses (Graves' disease, renal disease, heart disease, and/or pulmonary disease).

Figure 5
Coccidioidomycosis
by Infection Site
LAC, 2003 (N=73)



Severity of Disease: Sites of infection were reported as primary pulmonary 66% (n=48), disseminated 3% (n=2), meningitis 4% (n=3), skin 10% (n=7), other (chest cavity mass, lymph node, neck node) 4% (n=3), and; in 14% (n=10) of the cases infection site was not stated (Figure 5). More than half of the cases were culture-confirmed (47%, n=34) and 31 cases were diagnosed by serological, histopathological, or molecular evidence. Of the 59 cases where information was available, 86% (n=51) were hospitalized. Nine cases died. The 2003 case fatality rate (12%) was the same as last year and lower than 2000's rate (16%).

COMMENTS

In LAC, the 2003 incidence for coccidioidomycosis was higher than the previous year. Overall, the rate has been increasing since 2000. The increase appears to start in the fall of 2003. Although the number of cases reported is small compared to other diseases, the costs in terms of disease severity, hospitalization, and mortality are great. As in past years, males, Blacks, and residents of the Antelope Valley and the West Valley are at higher risk for severe disease. Unlike previous years, more middle-aged adults were affected instead of the elderly, who are normally at high risk for illness.

In the fall of 2003, surrounding counties noted an increase of coccidioidomycosis cases. In particular, Ventura County noted a nine times than expected increase of cases (70 culture-confirmed). There was a less dramatic increase observed in LAC. Warm temperatures, below normal precipitation, and Santa Ana winds in the fall were ideal conditions for disseminating *Coccidioides immitus* spores. Also, the October 2003 wildfires in southern California may have contributed by destroying vegetation and increasing dust exposure.

PREVENTION

There is no safe and effective vaccine or drug to prevent coccidioidomycosis; prevention lies mainly in dust control such as planting grass in dusty areas, putting oil on roadways, wetting down soil, air conditioning homes, and wearing masks or respirators. Other options may be to warn individuals who are at high risk for severe disease not to travel to endemic areas when conditions are most dangerous for exposure.

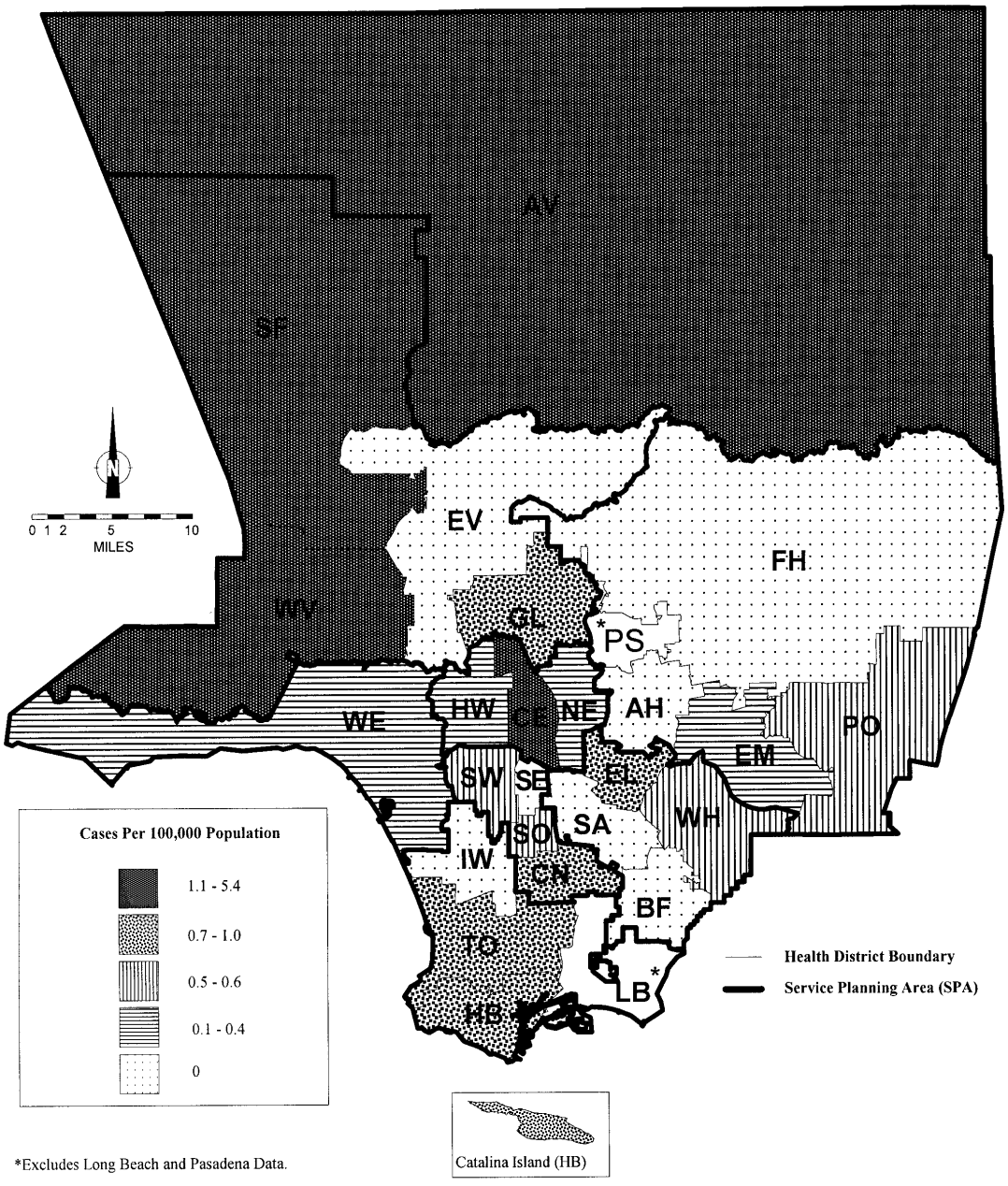
ADDITIONAL RESOURCES

National Fire Weather Report 2003 by Larry Van Bussum, National Weather Service, Boise, ID See report at: http://fire.boi.noaa.gov/FIREWX/AnnualReport/2003NationalReport.pdf

More information about coccidiomycosis is available from the CDC at: www.cdc.gov/ncidod/dbmd/diseaseinfo/coccidioidomycosis_t.htm

Kirkland TN, Fierer J. Coccidioidomycosis: A reemerging infectious disease. Emerg Infect Dis 1996; 2(3): 192–9.

MAP 3. Coccidioidomycosis
Rates by Health District, Los Angeles County, 2003*



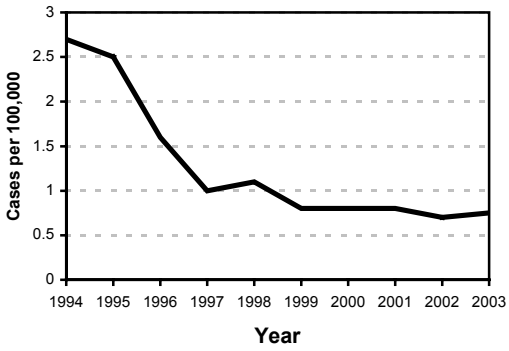
*Excludes Long Beach and Pasadena Data.

CRYPTOSPORIDIOSIS

CRUDE DATA	
Number of Cases	71
Annual Incidence[a]	
LA County	0.75
United States	1.13
Age at Diagnosis	
Mean	36.9
Median	38
Range	1–62
Case Fatality	
LA County	0.03%
United States	N/A

[a] Cases per 100,000 population.

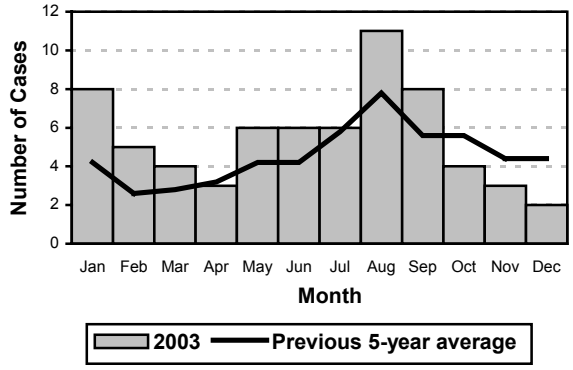
Figure 1
Cryptosporidiosis
Incidence Rates by Year of Onset
LAC, 1994–2003



DESCRIPTION

Cryptosporidiosis is fecal-orally transmitted when cysts of the parasite *Cryptosporidium parvum* are ingested. Common causes include unprotected sexual contact, particularly among men who have sex with men (MSM), and by swallowing contaminated recreational or untreated water. The usual incubation period is 2–10 days with typical symptoms of watery diarrhea, abdominal cramps, and low-grade fever; however, asymptomatic infection is also common. Symptoms last up to 2 weeks in healthy individuals. Those who have a weakened immune system may experience prolonged illness. Immunocompromised individuals (e.g., HIV/AIDS patients, cancer patients, transplant patients), young children and pregnant women are at risk for more severe illness.

Figure 2
Cryptosporidiosis
Cases by Month of Onset
LAC, 2003 (n=66)



DISEASE ABSTRACT

- The incidence rate for this disease increased slightly from 0.70 per 100,000 in 2002 to 0.75 per 100,000 in 2003. This is the first year that the incidence rate has increased since 1998. The last outbreak of this disease occurred during 1998.
- HIV infection and AIDS are the most common identified risk factors for cryptosporidiosis. Cryptosporidiosis has been an AIDS-defining disease since 1983. The number of reported cases has decreased since the advent of highly active antiretroviral therapy.

STRATIFIED DATA

Trends: The rate of cryptosporidiosis (0.75 cases per 100,000) increased slightly in 2003 (Figure 1).

Seasonality: In 2003, there was a peak in August coinciding with the previous 5-year average peak (Figure 2).

Age: The 35-44 age group had the highest incidence rate followed by the 45-54 age group (Figure 3).

Sex: The male-to-female rate ratio was 4.5:1. This is due to the high rate of cryptosporidiosis in MSM.

Race/Ethnicity: Blacks had the highest incidence rate (Figure 4), followed by Latinos and then Whites. Two cases were reported as "Other" (2.8%) and race was unknown for 4 cases (5.6%). The rate for Whites decreased from 1.3 per 100,000 (n=36) in 2002 to 0.6 per 100,000 (n=21) in 2003.

Location: Location information was available for all 62 cases. Hollywood-Wilshire Health District had the highest incidence rate 4.2 per 100,000 (n=22) followed by Central Health District 2.3 per 100,000 (n=8).

Risk Factors: Complete risk factor data was not available for all cases; 8 cases (11%) were either unable to be located or refused to be interviewed (Figure 5). HIV infection and AIDS accounted for 66% of the cases, 3 of these cases were female. Animal contact (37%), outdoor activities (17%, including swimming, camping and hiking) and recent international travel (16%) were the other most common risk factors following HIV status. Many cases had more than one risk factor.

Figure 3
Cryptosporidiosis
Incidence Rates by Age Group
LAC, 2003

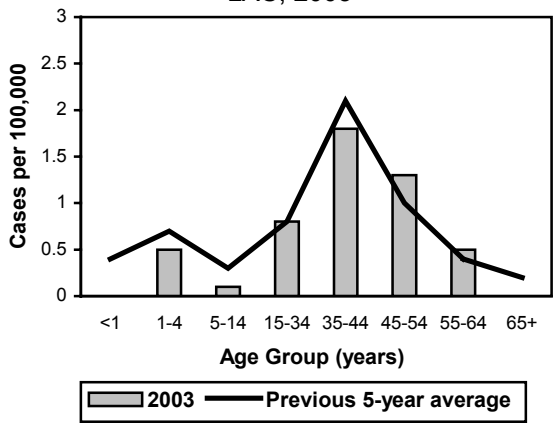


Figure 4
Cryptosporidiosis
Incidence Rate by Race/Ethnicity
LAC, 2003

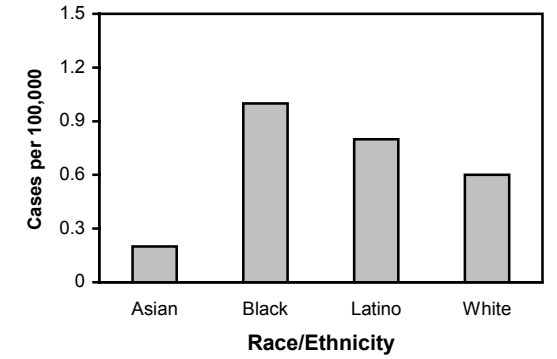
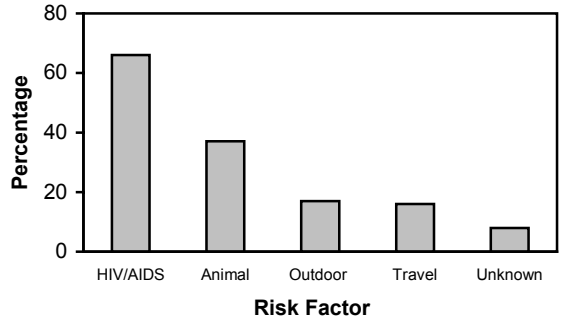


Figure 5
Cryptosporidiosis
by Reported Risk Factor
LAC, 2003



COMMENTS

Risk factors were self reported and were not proven to be the actual source of infection. A large percentage (62%) of the cryptosporidiosis cases were among HIV positive males. The actual percentage could be higher since 9 cases, (13%, all male) had unknown HIV status. In 2003 the majority of HIV male cases were Hispanic (54%), compared to 2002 where the majority of HIV male cases were white (66%). Cryptosporidiosis can become a chronic infection among immunocompromised patients and cases are often reported multiple times; however, within this report, cases are counted only once. There has not been an outbreak of cryptosporidiosis in LAC since 1988, which involved

contaminated swimming pool water [1].

RESOURCES

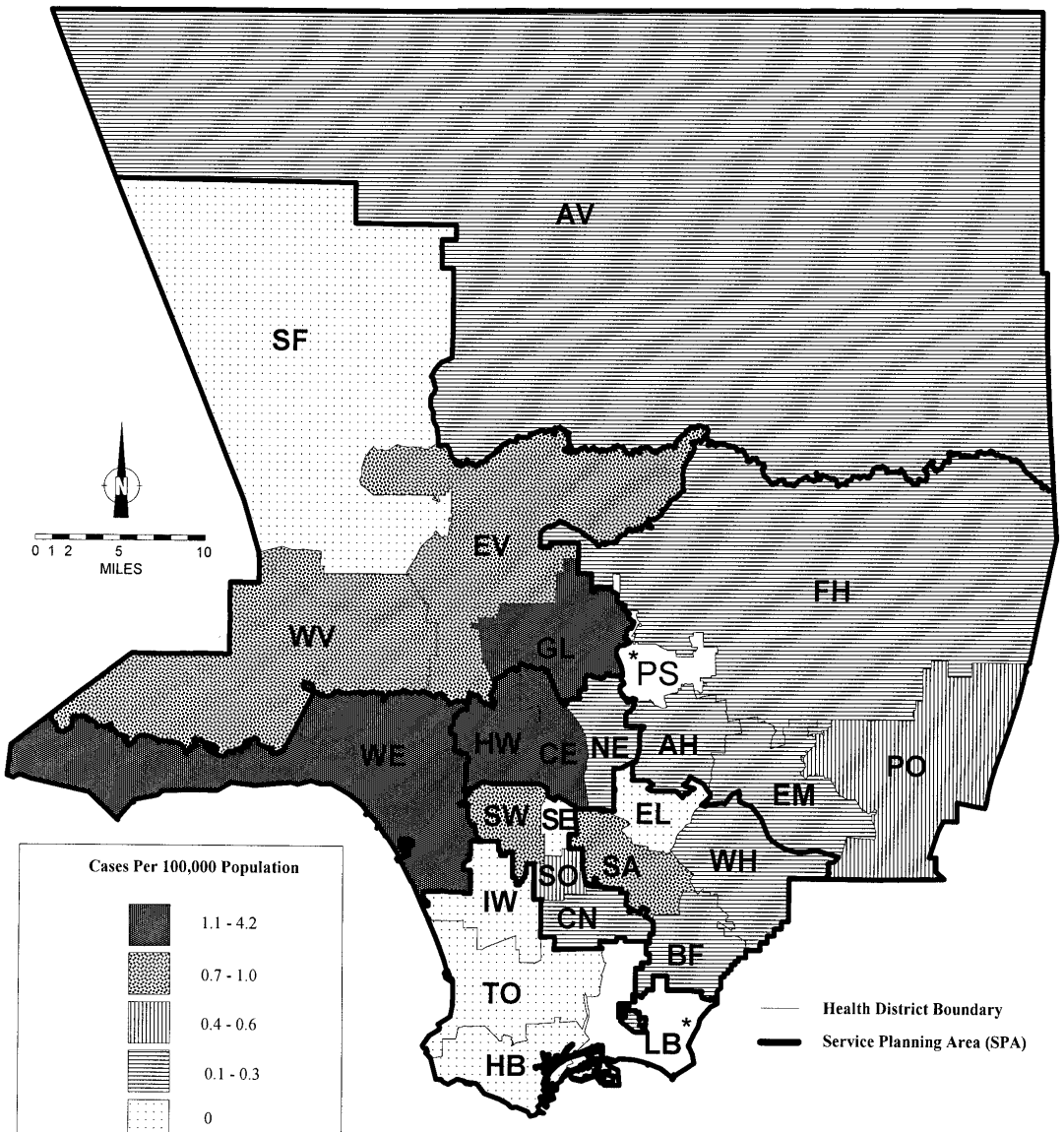
1. Sorvillo FJ, Fujioka K, Nahlen B, Tormey MP, Kebabjian R, Mascola L. Swimming-associated cryptosporidiosis. Am J Public Health 1992; 82(5): 742-4.

ADDITIONAL RESOURCES

General disease information is available from the CDC at:
www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/default.htm

General information and reporting information about this and other foodborne diseases in LAC is available at: www.lapublichealth.org/acd/food.htm

MAP 4. Cryptosporidiosis
Rates by Health District, Los Angeles County, 2003*



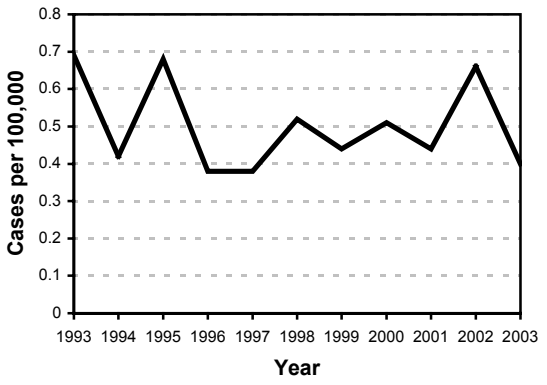
*Excludes Long Beach and Pasadena Data.

ENCEPHALITIS

CRUDE DATA	
Number of Cases	38
Annual Incidence [a,b]	
LA County	0.40
California	N/A
United States	N/A
Age at Diagnosis	
Mean	27
Median	17
Range	0-89 years
Case Fatality	
LA County [b]	13%
United States	N/A

[a] Cases per 100,000 population.
[b] Excludes AIDS encephalopathy cases.

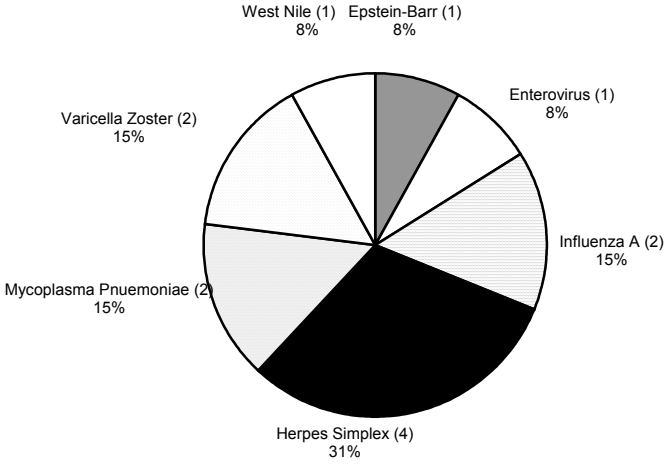
Figure 1
Encephalitis
Incidence Rates by Year of Onset
LAC 1993–2003



DESCRIPTION

Encephalitis, an inflammation of parts of the brain, spinal cord and meninges, causes headache, stiff neck, fever and altered mental status. It can result from infection with a number of different agents including viral, parasitic, fungal, rickettsial, bacterial and chemical. Public health surveillance is limited to cases of suspected or confirmed viral etiology, which includes primary and post-infectious encephalitis—but excludes individuals with underlying Human Immunodeficiency Virus (HIV) infection. Of special concern is arboviral (mosquito-borne) encephalitis, which can be prevented by personal protection and mosquito control.

Figure 2.
Encephalitis by Etiology
LAC, 2003 (N=13)



DISEASE ABSTRACT

- The incidence of viral encephalitis in 2003 was 0.40 cases per 100,000 population (Figure 1).
- In 2003, the case fatality, 13%, was lower than prior years, 16% and 38%, 2002 and 1997 respectively. The 2003, the LAC case fatality rate is comparable to that seen in the California Encephalitis Project in 2003, reported as 16% statewide.

- The majority of encephalitis cases were under age 44 years of age: 15 (40%) were in children less than 15 years of age and 15 (40%) were in those from 15 to 44. The remainder were 3 (7.5%) cases between 45 to 54 years, and 5 (12.5%) occurred in those more than 55 years.
- There were 23 (61%) male cases and 15 (39%) female cases.
- Hispanics had the greatest number of reported encephalitis cases, 15 (39%), followed by Whites, 14 (38%), Black, 4 (10%), Asian, 2 (5%), and 3 (8%) with race unknown.
- Cases of encephalitis occurred throughout LAC; SPA 2 had 12 cases, followed by SPA 3, 4, 6, 7, 8 with 4 cases each, and SPA 1 and SPA 5 with 3 cases each.
- The underlying etiologies of encephalitis were identified in only 13 (34%) of reported cases. The etiologies were identified included: 4 (31%) herpes simplex virus (HSV), 2 (15%) influenza A, 2 (15%) varicella zoster virus (VZV), 2 (15%) *Mycoplasma pneumoniae*, and 1 (8%) case each caused by Epstein-Barr, 1 (8%) West Nile virus, and 1 (8%) enterovirus (Figure 2).
- One case of encephalitis was due to WNV infection that was acquired in the state of Louisiana.

The reported annual incidence of acute encephalitis has varied from 3.5-7.4 cases per 100,000 person-years. In 2003, the overall viral encephalitis rate of 0.4 per 100,000 person-years is far lower that rates quoted in the surveillance literature. Reasons to explain our lower rate could be the exclusion of other infectious etiologies of encephalitis, inclusion of seriously ill patients by medical facilities and misclassification of aseptic meningitis as encephalitis cases in earlier surveillance reports from the 1950-1990's, and under reporting of hospitalized encephalitis cases, since all reporting is passive. The mortality ratio in LAC from encephalitis has ranged from a high of 38 % in 1997 to a low of 12.5% in 2003. LAC mortality data is consistent with data from the California Encephalitis Project with an overall reported mortality ratio of 16 % in 2003. In both LAC and the California Encephalitis Project, reporting may be biased to the more severely ill individuals.

The underlying etiologies of encephalitis are diverse in both infectious etiologies as well as non-infectious etiologies. Encephalitis surveillance at ACDC is dedicated to acute viral etiologies excluding underlying HIV infection. Even with exhaustive testing, the underlying etiology of encephalitis is difficult to determine. Reviewing their 291 encephalitis cases from 1998-2000, the California Encephalitis Project found confirmed or probable infectious etiologies in only 15% of their encephalitis characterized as due to infectious etiology despite exhaustive viral, bacterial, fungal and parasitic testing. In 2003, 18 (45%) encephalitis cases reported to ACDC were enrolled in the California (CA) Encephalitis Project. The etiology was identified in 7 cases (39%) enrolled in the CA Encephalitis Project. Of the 38 total cases reported to ACDC in 2003, the etiology was identified for 13 (32.5%) cases (Figure 2). Determining the etiology of encephalitis allows public health to follow disease trends, to notify the community of increased disease risk, and to implement prevention efforts.

Of particular public health concern in LAC are the arthropod-borne (arboviral) encephalitides, St. Louis encephalitis (SLE), western equine encephalitis (WEE) and West Nile (WNV) viruses, which are endemic to California. Since 1985, sporadic cases of SLE have been reported, following an outbreak of 16 cases in 1984. The last confirmed SLE case in LAC was in 1997. The potential for another SLE outbreak exists, as sporadic cases in previous years and identification of SLE in sentinel chicken populations indicate that the virus is now endemic in LAC. Beginning in 2001, arboviral disease surveillance has included WNV, in addition to SLE and WEE. Beginning in 2001, the LAC PHL has served as a reference laboratory and provided human testing for (WNV). In 2003, one reported encephalitis case was determined due to WNV. This California (CA) resident had traveled to a WNV endemic state, Louisiana, and became ill upon return in CA. In October 2003 one locally acquired case of WNV fever was identified in LAC (see special report section). It is expected that the encephalitis due to WNV will be a major cause of encephalitis within LAC and CA as WNV becomes established in the mosquito and bird populations of CA.

Prevention measures for arboviral infections consist of personal protection, screened windows, avoiding mosquito-infested areas especially at dusk when most mosquitoes are active, wearing protective clothing and use of insect repellants containing DEET. Elimination of standing water and proper maintenance of

ponds and swimming pools decrease the available sites for hatching and maturation of mosquito larvae. Five local mosquito abatement districts monitor and control populations of these insects, especially in areas used by the public.

Future Directions: Surveillance for WNV infection in humans, mosquitoes, sentinel chickens, and dead birds will continue throughout the state of CA and LAC. Research is underway to develop a WNV vaccine and treatment for humans. No human vaccine is available for SLE, WEE, and WNV. A human vaccine exists for Japanese equine encephalitis.

Licensed equine (horse) vaccines are available for WEE, EEE, and WN viruses.

ADDITIONAL RESOURCES

Glaser CA, Gilliam S, Schnurr D, Bagher F, Honarmand S, et al. In search of encephalitis etiologies: Diagnostic challenges in the California Encephalitis Project, 1998–2000. CID 2003; 36: 731-42.

Khetsuriani H, Holman RC, Anderson LJ. Burden of encephalitis-associated hospitalizations in the United States, 1988–1997. CID 2002; 25: 175-82.

Johnston RT. Acute Encephalitis. CID 1996; 23: 219-26.

Nicolosi A, Hauser WA, Beghi E, Kurland LT. Epidemiology of central nervous system infections in Olmsted County, Minnesota, 1950–1981. J Inf Ds 1986; 154: 399-498.

Trevejo RT. Acute Encephalitis Hospitalizations, California, 1990-1999: Unrecognized arboviral Encephalitis? Emerging Inf Dis 2004; 10(8): 1442-1449.

For information on mosquito-borne encephalitis: www.cdc.gov/ncidod/dvbid/arbor/index.htm

For information for consumers: www.nlm.nih.gov/medlineplus/encephalitis.html

For more detailed information such as causal information and effective management strategies: www.postgradmed.com/issues/1998/03_98/guti.htm

Information about case investigation of encephalitis in LAC is available at: www.lapublichealth.org/acd/procs/b73/b73index.htm

CDC website—Q & A about West Nile Virus: www.cdc.gov/ncidod/dvbid/westnile/q&a.htm

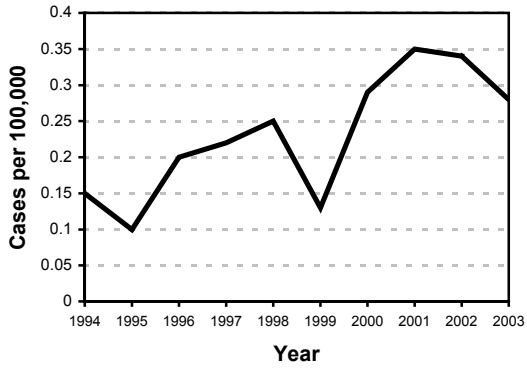
Mosquito and Vector Control Association of California: www.mvcac.org

ESCHERICHIA COLI O157:H7 / HEMOLYTIC UREMIC SYNDROME

CRUDE DATA	
Number of Cases	27
Annual Incidence[a]	
LA County	0.28
California	0.72
United States	0.88
Age at Diagnosis	
Mean	23.6
Median	14
Range	1–80 years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.

Figure 1
Escherichia coli O157:H7
Incidence by Year of Onset
LAC, 1994–2003



DESCRIPTION

Escherichia coli O157:H7, a gram-negative bacillus, is a specific serotype of the Shiga-toxin producing class of *E. coli* (STEC). Incubation period is 2-8 days. Shiga-toxins cause abdominal cramps and watery diarrhea often developing into bloody diarrhea; fever is uncommon. Likely modes of transmission include foodborne (e.g., undercooked ground beef, fresh produce, unpasteurized juice, raw milk) and person-to-person (e.g., day-care settings). There also have been outbreaks associated with recreational water exposure and exposure to animals and their environments.

Children younger than five years of age are at highest risk for hemolytic uremic syndrome (HUS), a clinical complication consisting of hemolytic anemia, thrombocytopenia, and kidney failure. Adults may acquire thrombotic thrombocytopenic purpura (TTP) after infection.

DISEASE ABSTRACT

- There was a 10 % decrease in the number of confirmed cases in 2003.
- Two outbreaks were identified in LAC during 2003.

STRATIFIED DATA

Trends: The rate decreased again in 2003 (Figure 1). There had been a 3-year trend of increasing incidence from 1999 to 2001.

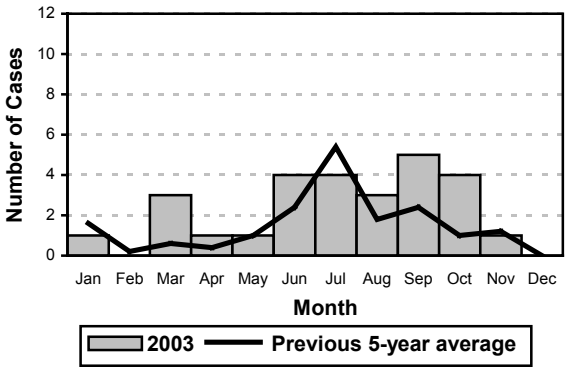
Seasonality: In 2003, 59% of cases occurred during the late spring and summer months with a peak in September (Figure 2). This was consistent with the 5-year average, although the peak was later in the summer months.

Age: In 2003, more laboratory confirmed cases were in adults (56%). Eighty percent of the adult cases were sporadic and not linked to an outbreak.

Sex: The male to female ratio was 1:1.4.

Race/Ethnicity: The highest percentage of cases was again among Whites (63%). Asians had a higher representation with 22% and Latinos had a lower representation (7%) when compared to 2002 and to the five-year average. Blacks had 7% no change.

Figure 2
Esherichia coli O157:H7
Cases by Month of Onset
LAC, 2003



Location: SPA 2 had 30 % of all confirmed cases followed by SPA 8 (22%). SPAs 3 and 5 each had 15% of confirmed cases. A multi jurisdictional outbreak involved three individuals living in SPA 3; another outbreak (four cases) occurred in SPAs 5 and 8. Although most cases in SPA 2 were reported sporadically, two cases did have a similar if not indistinguishable PFGE pattern. These two cases could not be linked epidemiologically.

Severity of Illness: Of confirmed cases with available information, 96% reported diarrhea, 92% reported abdominal cramps, 81% had bloody diarrhea, 38% had nausea or vomiting, and 42% reported having fever (mean temperature was 100.9^0F). One confirmed case had only mild cramping and was not seen by a physician; testing of this case was conducted as part of an outbreak investigation. Eleven confirmed cases (42%) required hospitalization. There were no reported deaths.

HUS: In 2003, there was one LAC case with confirmed *E. coli* O157:H7 with HUS and six reported cases of HUS without lab confirmation of *E. coli* O157:H7. Of these seven cases of diagnosed HUS, 6 (86%) were one to three years of age. Two cases required dialysis. There were no deaths among the HUS cases.

Risk Factors: In the week prior to onset, confirmed cases with available information reported eating ground beef (54%), lettuce (81%), fast food (62%) or food from other types of restaurants (54%). There were no reports of travel.

COMMENTS

There were two outbreaks of confirmed *E. coli* O157:H7 investigated in LAC during 2003, one was associated with ground meats and the other was a multi jurisdictional outbreak associated with romaine lettuce.

Collaborative efforts among physicians, laboratories and the health department are important for enhancement of surveillance activities. Physicians should request testing for *E. coli* O157:H7 on all bloody stools. Physicians should consider *E. coli* O157:H7 in their diagnoses by asking about consumption of high-risk foods, attendance at day-care centers or farms and exposure to other individuals with diarrhea. All cases of HUS should be reported immediately and physicians should request testing for *E.coli* O157:H7 for these patients.

Lab analysis through PFGE has been helpful in detecting clusters of *E. coli* O157:H7. PulseNet is a nationwide network of laboratories that performs PFGE, or “DNA fingerprinting” of foodborne bacteria.

This network permits rapid comparison of the fingerprint patterns to identify clusters and enhance outbreak investigation.

PREVENTION

Increased public education to prevent *E. coli* infection is needed. Information should focus on safe food handling practices, proper hygiene and identifying high-risk foods and activities. To avoid infection, beef products should be cooked thoroughly. In addition, one should drink only treated water and avoid swallowing water during swimming or wading. Careful handwashing is essential, especially before eating and after handling raw beef products or coming in contact with or being around animals. The collection of detailed food histories is important to understand underlying sources of infection. The strengthening of national food processing regulations to decrease contamination is also important to reduce infection.

ADDITIONAL RESOURCES

General information about this disease can be found at:
www.cdc.gov/ncidod/diseases/submenus/sub_ecoli.htm

Foodborne disease active surveillance is available from FoodNet (CDC) at: www.cdc.gov/foodnet

Information from the Gateway to Government Food Safety is available at:
www.foodsafety.gov

Information about outbreaks (nationwide) is available from the Outbreak Response and Surveillance Unit of the CDC at: www.cdc.gov/foodborneoutbreaks/index.htm

General information and reporting information about this and other foodborne diseases in LAC is available at: www.lapublichealth.org/acd/food.htm

GIARDIASIS

CRUDE DATA	
Number of Cases	401
Annual Incidence[a]	
LA County	4.27
United States	6.33
Age at Diagnosis	
Mean	26.7
Median	25
Range	<1–88 years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.

Figure 1
Giardiasis
Incidence Rates by Year of Onset
LAC, 1994–2003

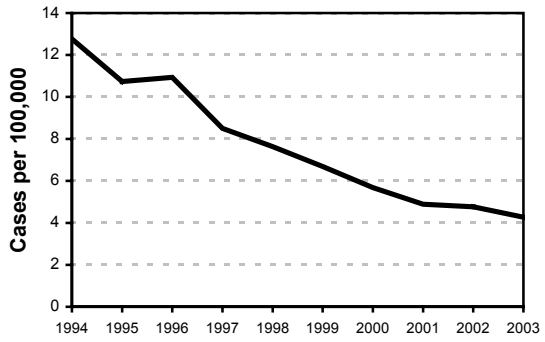
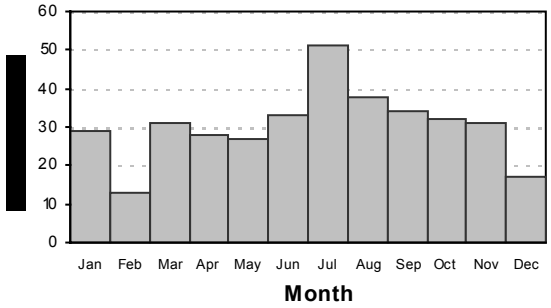


Figure 2
Giardiasis
Cases by Month of Onset
LAC, 2003 (N=364)



DESCRIPTION

Giardiasis is an intestinal infection caused by the zoonotic protozoan parasite *Giardia intestinalis* (previously *G. lamblia*). *Giardia* cysts shed in animal or human feces may contaminate food or drinking water or be transferred on hands or fomites; recreational waters such as lakes and pools may also serve as vehicles of transmission. Incubation can range from 3-25 days or longer, but the median incubation time is 7-10 days. While usually asymptomatic, symptoms can include sulfurous burps, chronic diarrhea, frequent loose and pale greasy stools, bloating, cramps, fatigue, and weight loss. Complications are rare, but may include malabsorption of fats and fat-soluble vitamins. Children in day care represent a reservoir of disease in developed countries. There is no vaccine.

DISEASE ABSTRACT

- The incidence of *Giardia* in LAC has dropped annually over the past 10 years, and has reached an all-time low in 2003.
- Incidence tends to increase during summer months when high-risk activities such as recreational water exposure also increase.

STRATIFIED DATA

Trends: Giardiasis incidence in LAC has dropped annually in the last 10 years, and has reached an all-time low during 2003; the number of cases reported decreased more than 67% over the past 10 years (1,104 cases reported in 1994, Figure 1).

Seasonality: The number of cases typically increases during summer months when recreational exposure (i.e., swimming in infected pools, lakes, etc.) is more likely (Figure 2).

Age: As in previous years, the highest age-specific incidence rate occurred among children aged 1–4 years (8.2 cases per 100,000), followed by children aged 5-14 (6.1 cases per 100,000).

Sex: Males continue to be more likely to contract *Giardia* than females (1.5:1).

Race/Ethnicity: Whites continue to have higher race/ethnicity specific incidence rates than other races. Compared to previous years, the incidence for Hispanics has decreased while the incidence for Blacks has increased (Figure 3); Hispanics have a slightly higher race/ethnicity specific incidence than Blacks, and Asians have the lowest race/ethnicity specific incidence.

Location: Of the eight SPAs across LAC, three had rates that were higher than the overall county mean rate for this disease: SPA 2, San Fernando area (5.0 per 100,000), SPA 4 Metro area (4.9 per 100,000), and SPA 5 West (9.4 per 100,000). The rate in SPA 8 South Bay dropped substantially from 5.3 to 3.8 cases per 100,000 population.

Figure 3
Giardiasis
Incidence Rates by Age Group
LAC, 2003

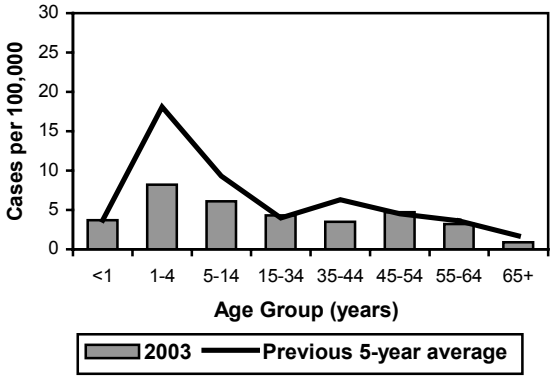
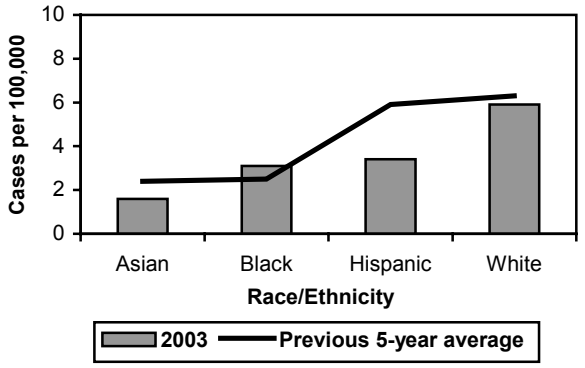


Figure 4
Giardiasis
Incidence Rates by Race/Ethnicity
LAC, 2003



COMMENTS

There has been a considerable decline in incidence of *Giardia* over the past decade. While the specific reasons for this decrease are unknown, several factors may have contributed including advances in food and water safety as well as improved education about safety regarding recreational water (i.e., avoiding drinking lake and pool water, keeping babies in diapers and individuals with diarrhea from swimming in public facilities).

There were no outbreaks reported in 2003.

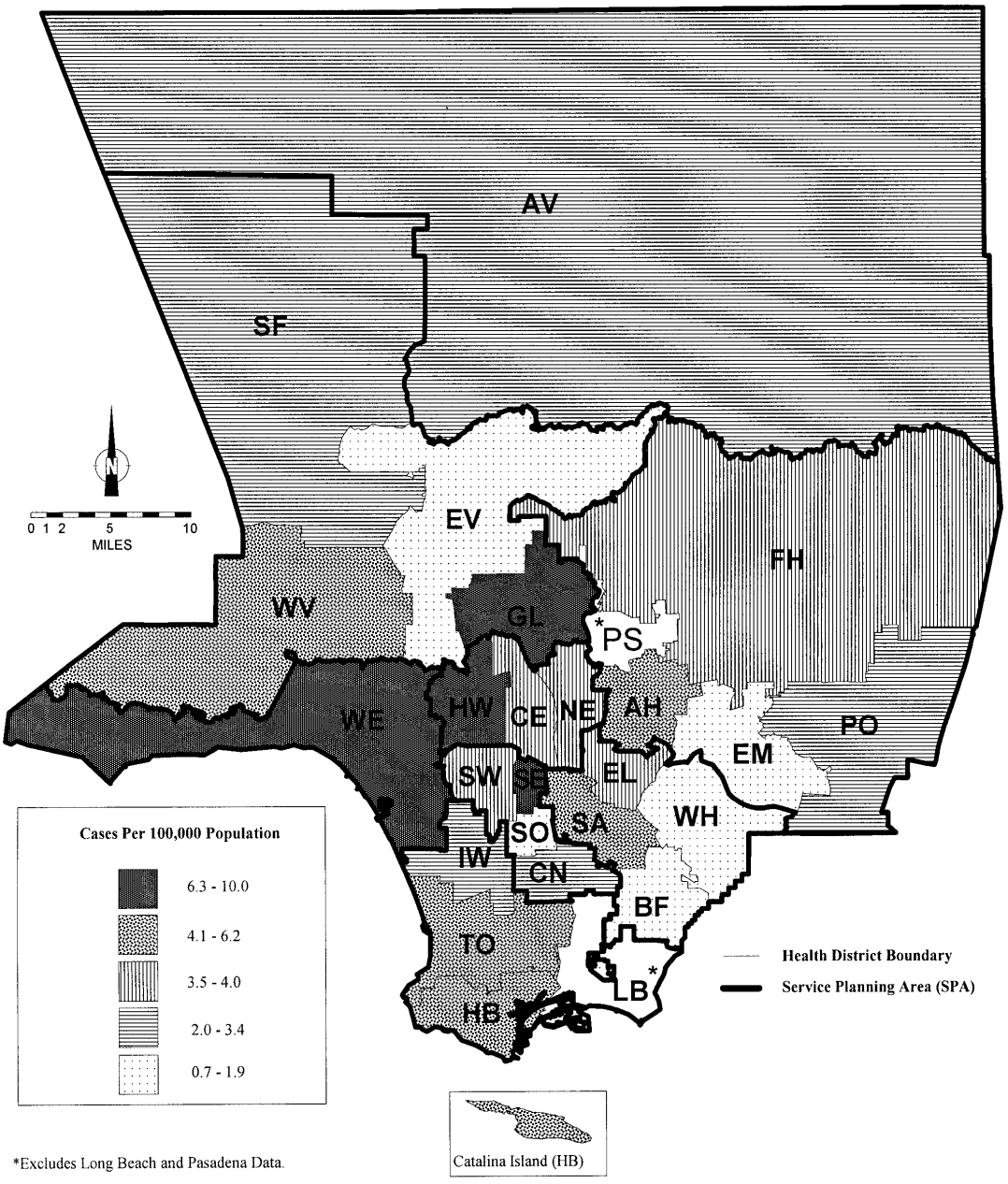
ADDITIONAL RESOURCES

CDC. Giardiasis Surveillance—United States, 1992–1997. MMWR 2000; 49(SS07): 1–13. Available at: www.cdc.gov/epo/mwr/preview/mmwrhtml/ss4907a1.htm

CDC. Parasitic Disease Information Fact Sheet—Giardiasis. Available at: www.cdc.gov/ncidod/dpd/parasities/giardiasis/factsht_giardia.htm

CDC. Surveillance for Waterborne Disease Outbreaks—United States, 1997–1998. MMWR 2000; 49(SS04): 1–35. Available at: www.cdc.gov/epo/mmwr/review/mmwrhtml/ss4904a1.htm

MAP 5. Giardiasis
Rates by Health District, Los Angeles County, 2003*



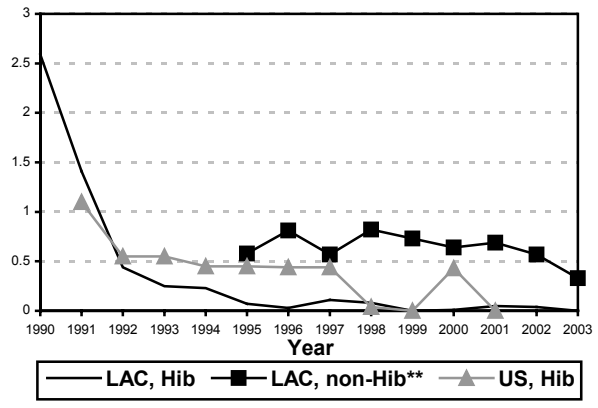
*Excludes Long Beach and Pasadena Data.

HAEMOPHILUS INFLUENZAE INVASIVE DISEASE

CRUDE DATA	
Number of Cases	56
Annual Incidence[a]	
LA County	0.60
California[b]	0.17
United States	0.70
Age at Diagnosis	
Mean	49.8
Median	59.0
Range	<1–101.0
Case Fatality	
LA County	0%
United States	N/A

[a] Cases per 100,000 population.
[b] Cases per 100,000 persons, aged less than 30 years. In California, *H. influenzae* among persons > 29 years of age is not reportable.

Figure 1
H. influenzae Invasive Disease
Incidence Rates by Year
LAC and US,* 1990–2003

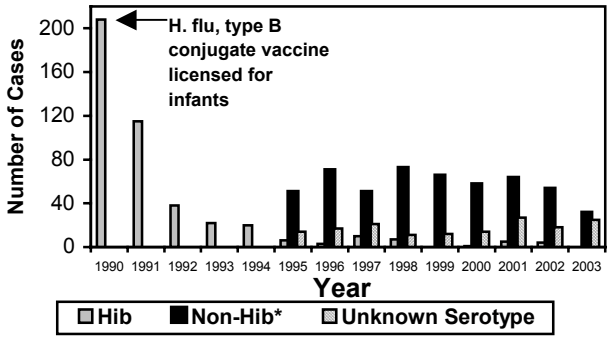


* Hib not nationally notifiable until 1991; no national data for non-b types
** Surveillance became mandated in 1995. Excludes unknown serotypes

DESCRIPTION

Haemophilus influenzae is a gram-negative coccobacillus that can cause both invasive and non-invasive disease. *H. influenzae* invasive disease includes meningitis, sepsis, pneumonia, cellulitis, and septic arthritis. The disease primarily affects infants and the elderly, as well as immunocompromised individuals and those who have abnormal splenic function. *H. influenzae* can be transmitted by respiratory secretions of individuals colonized with the organism. There are six encapsulated, typable strains (a–f) and unencapsulated, nontypable strains of *H. influenzae*. Prior to the introduction of the H. *influenzae* type b (Hib) conjugate vaccine in 1990, most cases of invasive disease in children were caused by type b. *H. influenzae* type b is the only serotype that is vaccine-preventable.

Figure 2
H. influenzae Invasive Disease
Cases by Year of Onset
LAC, 1990–2003



* Surveillance became mandated in 1995. Excludes unknown serotypes

DISEASE ABSTRACT

- The widespread use of the Hib vaccine since 1990 has dramatically decreased the incidence of *H. influenzae* type b disease in LAC (Figure 1, 2).
- No Hib cases were identified in 2003, marking only the second time this has occurred in 13 years.
- The epidemiology of H. *influenzae* invasive disease is now being shaped by non-b and unknown
- serotypes (Figure 3, Table 1).

Table 1. *H. influenzae* Crude Data by Serotype, 2003

	B		Non-b		Unknown type	
	2003	Previous 5-Year Average	2003	Previous 5-Year Average	2003	Previous 5-Year Average
Number of Cases	0	3.4	31	61.8	25	16.8
Age at Onset						
Mean	-	43.0	39.5	45.5	63.2	61.9
Median	-	37.9	40.0	48.2	72.0	68.2
Range	-	19.3-76.5	Birth-86.0	Birth-95.0	Birth-101.0	7.4-91.8
LAC Case Fatality	-	5.9%	0%	6.1%	0%	8.3%

IMMUNIZATION RECOMMENDATIONS

- All infants, including those born prematurely, can receive a primary series of conjugate Hib vaccine beginning at 2 months of age. The number of doses in the series depends on the brand of vaccine used. A booster is recommended at 12-15 months regardless of which brand of vaccine is used for the primary series.
- Individuals older than 59 months of age do not need Hib vaccination unless they have a health condition that puts them at increased risk for invasive Hib disease.

STRATIFIED DATA

Seasonality: A temporal pattern has been evidenced in LAC, with a peak in non-Hib cases that begins in September and declines after April. However, non-Hib cases in 2003 seemed to follow an unusual pattern in comparison to previous years, with the onset of cases distributed fairly uniformly throughout the year. March and May accounted for 38.7% (n=12) of cases (Figure 4).

Sex: The male-to-female ratio of non-Hib and unknown serotype cases was 1:0.9 and 1:0.6, respectively.

Age: The number of cases by age in 2003 follows the trend of previous years—the 65+ age group remaining the most affected by non-Hib invasive disease over the last six years (Figure 5). However, 45.2% (n=14) of non-Hib cases in 2003 were individuals younger than 25 years. Of the 25 cases with unknown serotype, 21 (84%) were over the age of 30 and were not actively investigated for serotype as detailed in LAC's priority investigation criteria. In addition, 72% (n=18) of these individuals were over the age of 54 years.

Figure 3
H. influenzae Invasive Disease
Percent Cases by Serotype
LAC, 2003 (N=56)

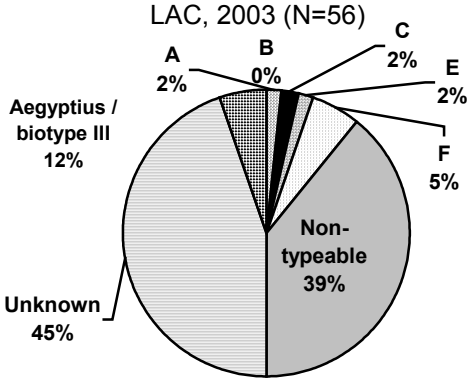
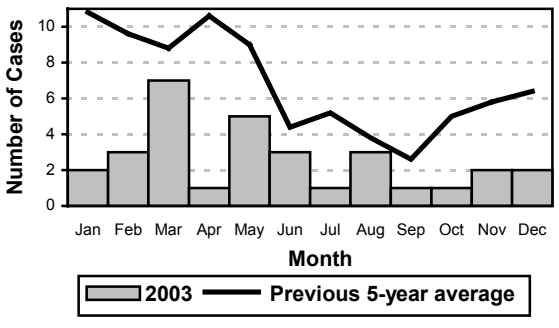


Figure 4
H. influenzae Invasive Disease
Cases Due to Non-b Serotype
by Month of Onset
LAC, 2003 (N=31)



Race/Ethnicity: In cases where the race/ethnicity was known, Latinos accounted for 38.5% (n=10) of the non-Hib cases, followed by Whites (n=9; 34.6%). Among the unknown serotype cases of whom race/ethnicity was identified, 41.2% were among Whites (n=7), followed by Latinos (n=5; 29.4%) (Figure 6.)

Location: Eleven (35.5%) of the non- Hib cases resided in two SPAs: San Fernando Valley (SPA 2) and South (SPA 6), however, an additional 35.5% of non-Hib cases had no identified SPA. The vast majority (96%) of the unknown serotype cases did not have a residence indicated as well.

COMMENTS

The only cases of *H. influenzae* investigated in LAC are those in persons less than 30 years of age. Contacts of these cases are investigated and chemoprophylaxis is given when appropriate.

ADDITIONAL RESOURCES

Information about immunization is available through the National Immunization Program at: www.cdc.gov/nip and the Immunization Action Coalition at: www.immunize.org

Information specific to LAC is available from:
- LAC DHS Immunization Program at: www.lapublichealth.org/ip
- ACDC: www.lapublichealth.org/acd/procs/b73/b73index.htm

Figure 5
H. influenzae Invasive Disease
Serotype Non-b Cases by Age Group
LAC, 2003 (N=31)

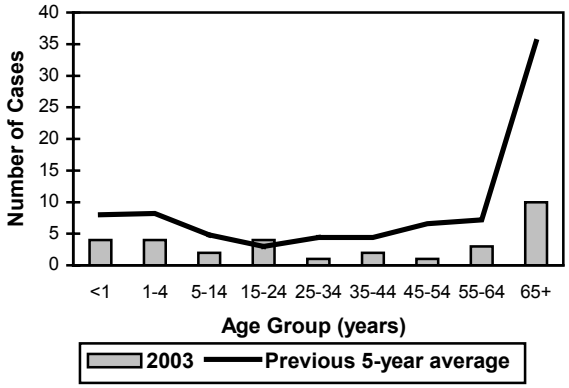
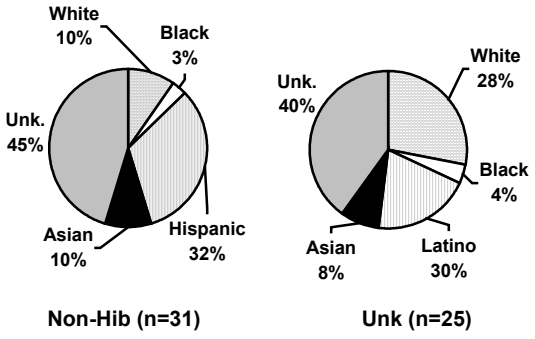


Figure 6
H. influenzae Invasive Disease
Percent Cases by Race/Ethnicity
LAC, 2003

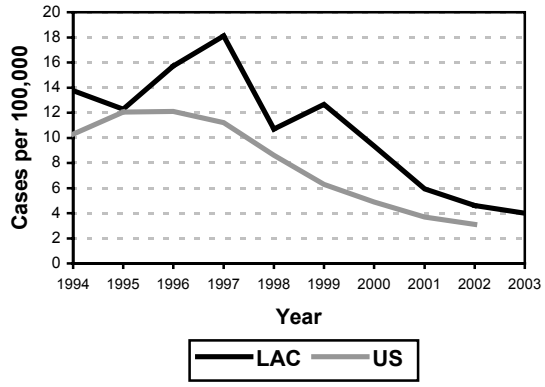


HEPATITIS A

CRUDE DATA	
Number of Cases	374
Annual Incidence[a]	
LA County	3.98
California	3.28
United States	2.66
Age at Diagnosis	
Mean	41
Median	40
Range	<1–88 years
Case Fatality	
LA County	0.8%
United States	N/A

[a] Cases per 100,000 population.

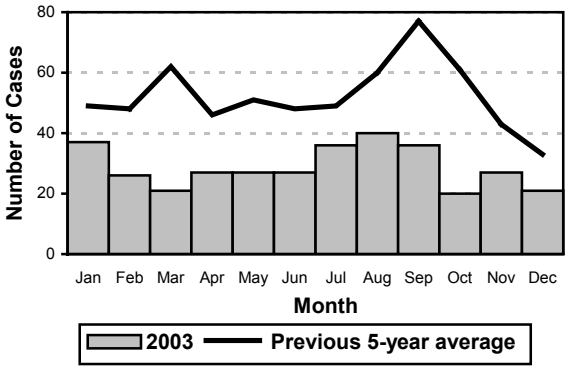
Figure 1
Hepatitis A
Incidence Rates by Year
LAC and US, 1994–2003



DESCRIPTION

Hepatitis A virus (HAV), a RNA-virus of the Picornaviridae family, is a vaccine-preventable disease transmitted fecal-orally, person-to-person, or through vehicles such as food. Signs and symptoms of acute hepatitis A include fever, malaise, dark urine, anorexia, nausea, and abdominal discomfort, followed by jaundice. Many cases, especially in children, are mild or asymptomatic. Sexual and household contacts of HAV-infected persons are at increased risk for getting the disease. The average incubation period is 28 days (range 15–50 days). Recovery usually occurs within one month. Infection confers life-long immunity. For surveillance purposes in LAC, a case of acute hepatitis A is defined as having a positive laboratory test for the IgM antibody to HAV, which can indicate recent infection. A case meets the clinical definition if it occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., a household or sexual contact of an infected person during the 15–50 days before the onset of symptoms).

Figure 2
Hepatitis A
Cases by Month of Onset
LAC, 2003



DISEASE ABSTRACT

- The annual incidence rate of hepatitis A cases reported in LAC showed a steady decrease in 2003.
- Hepatitis A incidence rates in all ages less than 65 have been decreasing; however, incidence rates in persons aged 65+ are still high.
- The demographic characteristics of 2003 cases were similar to the last five years.
- There was a peak of cases in the summer.

- Hospitalization rates were highest among young adults.

STRATIFIED DATA

Trends: There has been a steady decrease of hepatitis A cases in LAC since 1995. From 1994-1998, the rate ranged between 11-18 cases per 100,000 (Figure 1). From 1999 to 2003, the rate decreased from 13 to 4 per 100,000. In 2003, 374 cases were reported, a rate of 4 cases per 100,000.

Seasonality: There was a slight peak of hepatitis A cases in the summer of 2003 (Figure 2). This peak occurred one month earlier than had been seen in the previous 5 years.

Age: During 2003, the overall mean age for hepatitis A cases in LAC was 41 years. The mean age differed significantly by race and ethnic groups. The mean age for Latinos was 28 years while, White, Asian and Black cases had mean ages of 47, 53, and 39 years, respectively. These mean ages among the various racial/ethnic groups were similar to the previous year. Historically, the age specific rate has been highest in children aged 5–14 years. However, in 2003, the rate was highest among those 65 and older (7.5 per 100,000, Figure 3).

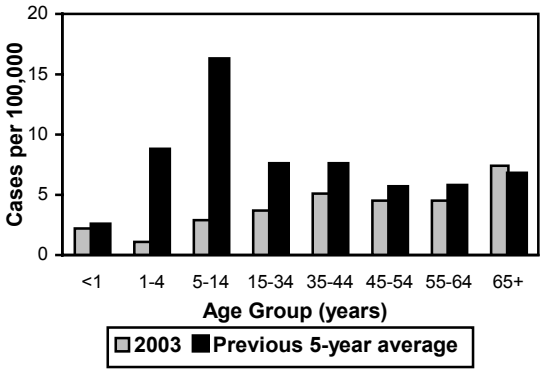
Sex: The overall HAV male-to-female rate ratio was 1:1.03. The male-to-female ratio for those aged greater than 18 years was 1:1.1. Among Latino cases, the male-to-female rate ratio was 1:1.45, while among White, Asian, and Black cases, incidence rates ratios were higher among males, at 1.11:1, 1.15:1, and 1.73:1, respectively.

Race/Ethnicity: The overall hepatitis A crude rate decreased for all ethnic groups in 2003 (4.0 per 100,000). As shown in Figure 4, the highest rate in 2003 was among Whites (4.6 per 100,000), followed by Asians (3.7), Latinos (2.5), and Blacks (2.4).

Location: Figure 5 shows district-specific HAV rates for 2003. The highest rate occurred in SPA 4 (5.6 per 100,000) closely followed by SPA 2 (5.4), SPA 8 (3.9), SPA 7 (3.3), SPA 6 (3.1), SPA 3 (2.9), SPA 5 (2.8), and SPA 1 (2.3).

Severity of Illness: Among all HAV cases in 2003, there were three reported fatalities (case-fatality rate=0.8%) aged 46, 53 and 83 years. 8% were hospitalized for their illness. Hospitalization was most prevalent among young adults.

Figure 3
Hepatitis A Incidence Rates
by Age Group LAC, 2003 (N=374)*



* Rates based on fewer than 20 cases are unreliable.

Figure 4
Hepatitis A Incidence Rates
by Race/Ethnicity
LAC, 2003

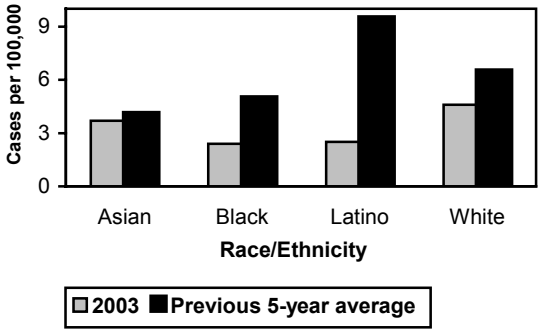
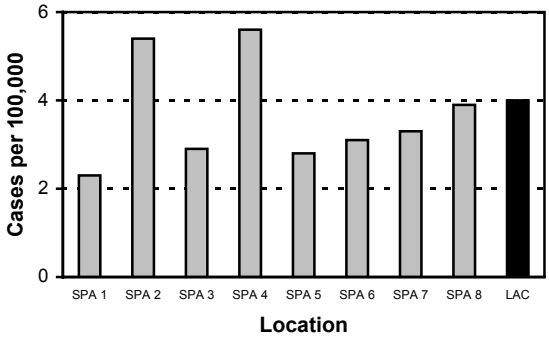


Figure 5
Hepatitis A Rates
by Location
LAC, 2003

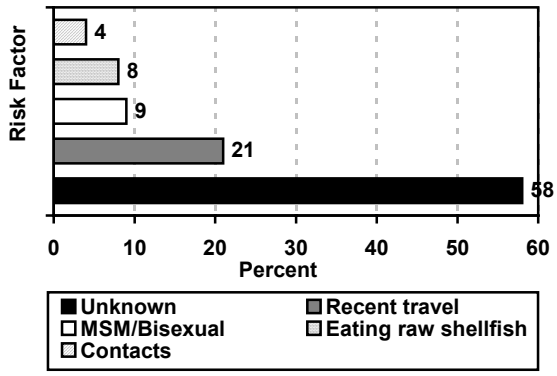


Risk Factors: Out of 374 hepatitis A cases, there were 110 cases did not have completed hepatitis A investigation forms. Of the 264 cases with information on hepatitis A investigation forms, recent travel outside of the US (n=55, 21%) was the most common risk factor reported (Figure 6). Other risk factors include MSM (9%), eating raw shellfish (8%), and being in contact with another case (4%). For many cases (58%) risk factors were unknown or not reported. Among travelers, South and Central American destinations (62%) were most frequently cited.

PREVENTION

Hepatitis A vaccine has been licensed in the US since 1995. In 1999, the Advisory Council on Immunization Practices (ACIP) recommended universal childhood vaccination in states (including California) and communities with rates equal to or greater than twice the national average (20 cases per 100,000) during 1987- 1997. LAC began providing the vaccine to children aged 2-18 since 1999. The number of hepatitis A cases in LAC decreased markedly with the distribution of vaccine to children.

Figure 6
Hepatitis A Reported Risk Factors
LAC, 2003



*Includes cases identifying multiple risks.

When cases of acute hepatitis A are reported to LAC DHS, Public Health Nurses educate clients about the importance of hand hygiene on reducing HAV infections. Close contacts, such as household contacts, sexual partners, and intimate contacts are offered post-exposure prophylaxis with immune globulin. Since HAV vaccinations have become available and in more routine use, it has been recommended by the Advisory Council on Immunization Practices (ACIP) that outbreaks of HAV could be effectively controlled through vaccine use (CDC, 1999).

COMMENTS

There has been a significant decrease in the number of cases of hepatitis A reported in LAC since 1997—though, this decrease may be due to the cyclical nature of hepatitis A. Other potential reasons for the decrease may be the ACIP recommendation (CDC, 1999) to provide hepatitis A vaccines for children, greater public awareness, or improved hygiene and food sanitation. Underreporting and underdiagnosis by physicians cannot be excluded as a reason for the decrease.

Hepatitis A is a mandated laboratory reportable disease in California. The 374 hepatitis A cases reported in 2003 were confirmed by IgM antibody to HAV, which may indicate recent infection.

Studies have shown that many children who acquired HAV are asymptomatic and not tested for HAV-IgM. Even when these children's laboratory results are confirmed IgM positive, many private health care providers and laboratories may not report HAV cases to county health officials. Therefore, support and encouragement for physician reporting and compliance with the ACIP recommendations should continue.

In LAC, most infections occur among international travelers, followed by MSM, those who eat raw shellfish, and those who report contact with a household member or sexual partner who has HAV. Therefore, it is important to educate travelers and MSM about hepatitis A vaccinations.

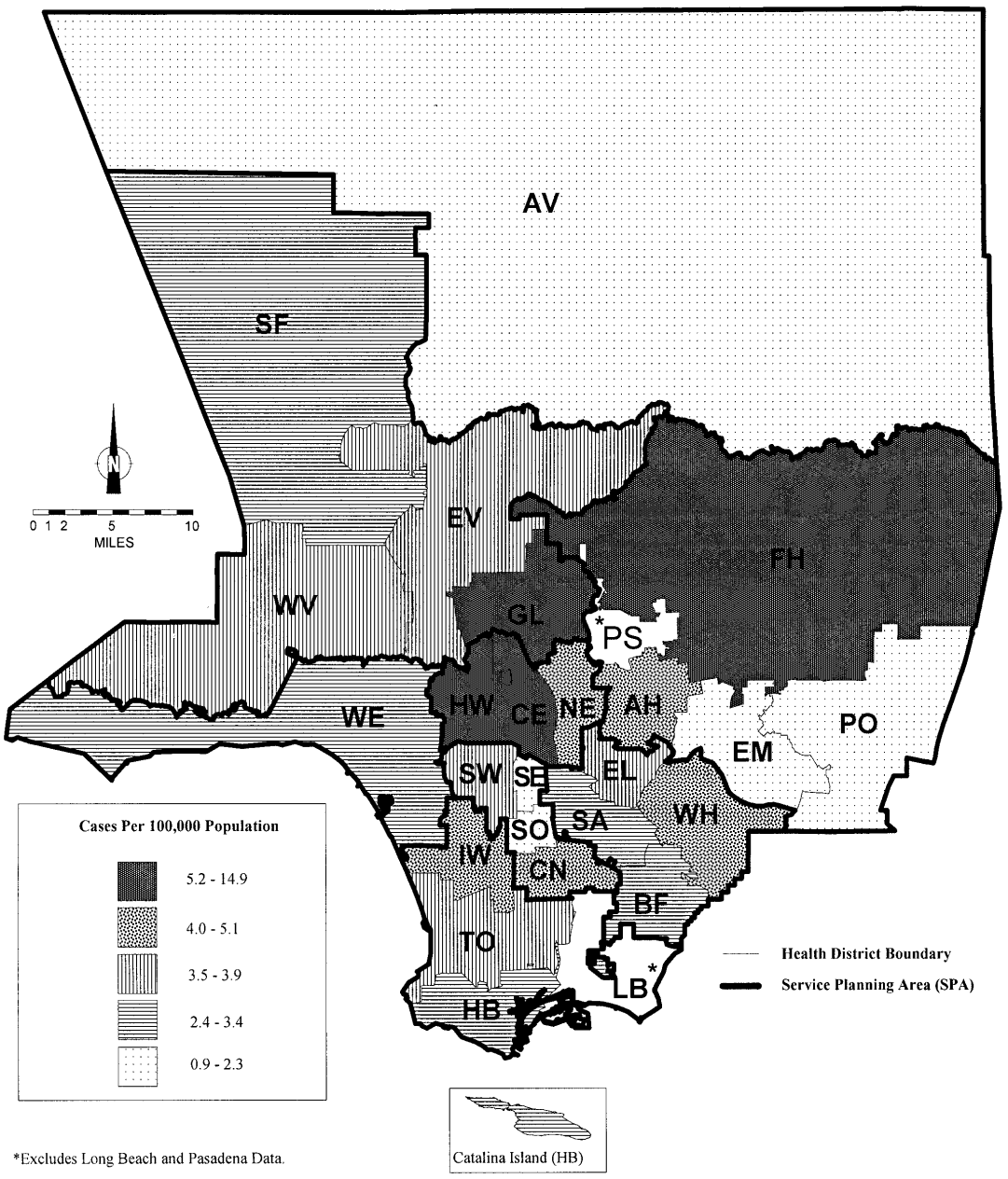
Increased awareness of the public about the mode of hepatitis transmission and the importance of good personal hygiene and proper sanitation may also lead to a significant reduction in disease incidence. There were no outbreaks of hepatitis A reported in 2003.

ADDITIONAL RESOURCES

General information about hepatitis is available from the CDC at:

- www.cdc.gov/ncidod/diseases/hepatitis/slideset/bibliography.htm
- www.cdc.gov/ncidod/diseases/hepatitis/a/index.htm

MAP 6. Hepatitis A
Rates by Health District, Los Angeles County, 2003*



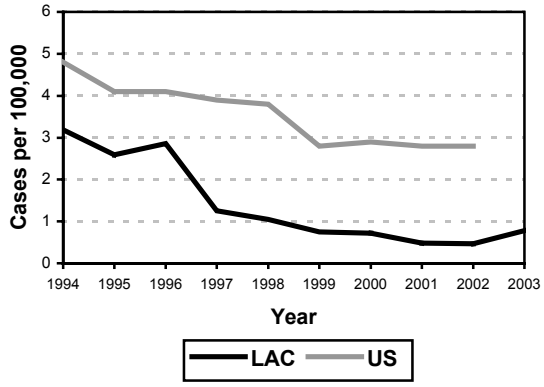
*Excludes Long Beach and Pasadena Data.

HEPATITIS B, ACUTE (NON-PERINATAL)

CRUDE DATA	
Number of Cases	73
Annual Incidence[a]	
Los Angeles	0.78
California	N/A
United States	N/A
Age at Diagnosis	
Mean	42
Median	41
Range	19–81years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.

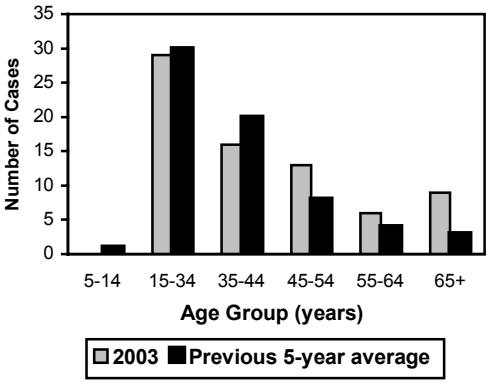
Figure 1
Hepatitis B
Incidence Rates by Year
LAC and US, 1994–2003



DESCRIPTION

Hepatitis B is more prevalent and infectious than AIDS. Hepatitis B is a vaccine-preventable disease transmitted through parenteral or mucous membrane exposure to the blood and other bodily fluids of individuals infected with the hepatitis B virus (HBV), a DNA-virus of the Hepadnaviridae family. It is also spread from mother to child at birth or soon after birth. Symptoms, which occur in less than half of those acutely infected, may be very mild and flu-like: anorexia, nausea, fatigue, abdominal pain, muscle or joint aches, jaundice and mild fever. Approximately 2–10% of adults infected with HBV are unable to clear the virus within six months and become chronic carriers. Death from cirrhosis or liver cancer is estimated to occur in 15–25% of those with chronic infection.

Figure 3
Acute Hepatitis B
Incidence Rates by Age Group
LAC, 2003

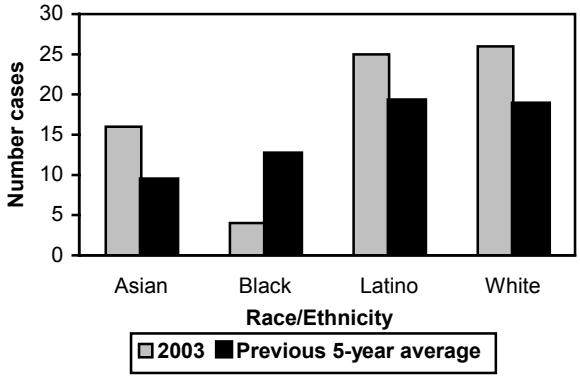


For the purpose of surveillance, LAC uses the CDC/CSTE criteria for acute hepatitis B which include: 1) discrete onset of symptoms and 2) jaundice *or* elevated aminotransferase levels, and 3) appropriate laboratory tests to confirm acute hepatitis B diagnosis (i.e., HBsAg positive or anti-HBc IgM positive, if done, *and* anti-HAV IgM negative, if done).

DISEASE ABSTRACT

- The number of acute hepatitis B cases in LAC in 2003 was 73 in comparison to the 32 acute cases for 2002 (Figure 1). The most significant increase was in persons aged >45 years.
- All acute cases were among adults aged 19 years or older and the majority of cases were young, adult males.
- Multiple partners, predominately in MSM (men who have sex with men), remains the most frequently identified risk (Figure 1).

Figure 4
Acute Hepatitis B
Number cases by Race/Ethnicity*
LAC, 2003



* Excludes 7 perinatal cases.

STRATIFIED DATA

Seasonality: None.

Age: Cases ranged in age from 19 to 81 years (the median age was 41) with 62% occurring in those aged under 45 years (Figure 3).

Sex: The male-to-female rate ratio was 1.2:1. The number of cases in males exceeded those in females in all ethnic groups.

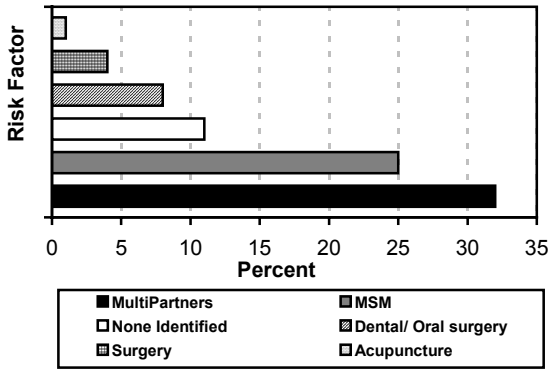
Race/Ethnicity: The highest number of cases were seen in Whites followed by Latinos, Asians and Blacks respectively (Figure 4).

Location: SPA 2 (n=18) and SPA 4 (n=18) had the most cases, respectively, followed by SPA 8 (n=11), SPA 3 (n=9), SPA 7 (n=8), SPA 6 (n=2), SPA 1 (n=2), and SPA 5 (n=1).

Severity of Illness: Among all acute HBV cases in 2003, there were no fatalities reported.

Risk Factors: Risk factors were reported for 75% of the cases (including some cases with multiple risk factors). Having multiple sexual partners (23 cases, 32%) was the most common risk factor reported in 2003, followed by MSM (18 cases, 25%), and recent dental or oral surgical procedures (6 cases, 8%) (Figure 2).

Figure 2
Hepatitis B Reported Risk Factors
LAC, 2003



*Includes cases identifying multiple risks.

PREVENTION

Decreasing rates of acute hepatitis B in children under age 19 is evidence of succeeding immunization strategy to eliminate HBV transmission in LAC. The immunization strategy includes: preventing perinatal HBV transmission by screening all pregnant women for HBsAg and providing immunoprophylaxis to infants of HBV-infected women, routine immunization of all infants, and catch-up vaccination of all previously unvaccinated children aged < 19 years.

New strategies are needed to reduce high-risk behaviors and provide resources for low-cost hepatitis B immunization for all, particularly for adults with the highest rates of transmission. Development and implementation of such strategies is possible through collaboration between public health, community-based organizations, and other agencies that serve target populations. Additionally, promoting hepatitis health education aims at eliminating, reducing, or mitigating high-risk behaviors in sexually active adults and increasing awareness and knowledge in the community.

COMMENTS

Notably, there was one nosocomial hepatitis B outbreak in 2003; three cases of acute hepatitis B patients 72, 74, and 75 years old were diagnosed in December, 2003. They were all residents of a single retirement home. Subsequent investigation by ACDC in 2004 revealed a total of 8 people with newly diagnosed exposure to hepatitis B. All patients were diabetic and the most likely cause of this outbreak was contaminated, shared diabetic equipment.

The number of acute hepatitis B cases in LAC in 2003 was 73 compared to 32 acute cases in 2002. Most of the cases occurred in young, sexually active males. It remains to be explained why there was a doubling of hepatitis B cases in 2003. All cases of acute hepatitis B are investigated and educated by public health nurses. Based on crude frequencies of reported risk factors by both men and women, MSM and people with multiple sexual partners continue to be at greatest risk for hepatitis B; thus, preventive efforts including education and vaccination should continue to focus on these high risk populations.

Surveillance for hepatitis B is passive and dependent solely upon reports from providers and laboratories. Ongoing improvements in reporting, data collection, and analysis should provide a more accurate description of this infection in the future.

ADDITIONAL RESOURCES

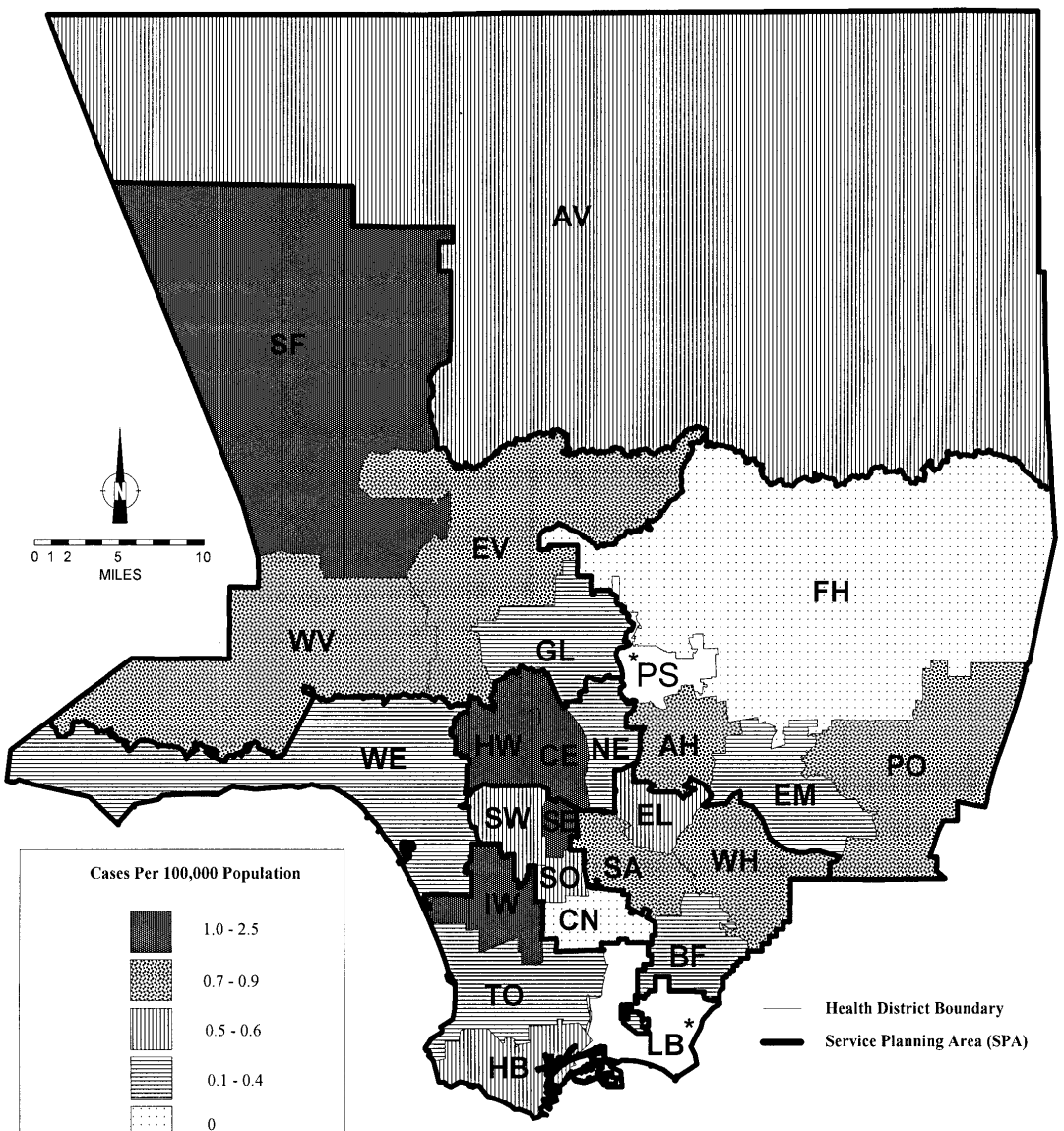
Epidemiology and Prevention of Viral Hepatitis slide set available at:
www.cdc.gov/ncidod/diseases/hepatitis/slideset/hep_b/slide1.htm

CDC Publications regarding viral hepatitis at: www.cdc.gov/ncidod/diseases/hepatitis/resource/pubs.htm

General information available at: www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm and www.hepb.org

Immunization information available at: www.immunize.org

MAP 7. Hepatitis B
Rates by Health District, Los Angeles County, 2003*



*Excludes Long Beach and Pasadena Data.

Perinatal hepatitis B has moved to the Special Disease Summaries section (page 163)

HEPATITIS C, ACUTE

CRUDE DATE	
Number of Cases	0
Annual Incidence	
LA County	--- [a]
California	N/A
United States	N/A
Case Fatality	
LA County	N/A
United States	N/A

[a] Rates based on fewer than 20 cases are unreliable.

DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus of the flavivirus family is predominantly transmitted through contact with contaminated blood and blood products. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercings. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. Hepatitis C completely resolves in only 15% of infections and progresses to a chronic illness in 60–70%. Medical complications occur decades after initial infection B including cirrhosis, liver failure, and hepatic cancer.

For the purpose of surveillance, LAC uses the CDC/CSTE criteria for acute hepatitis C which include discrete onset of symptoms and

1. A positive HCV test (antibody test EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8; and
2. Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal; and
3. No evidence of either acute hepatitis A or B disease.

DISEASE ABSTRACT

- There were 17 reported acute hepatitis C cases reported in 2003, but upon further investigation no case was confirmed that met the case definition for 2003. Of 9 that had ALT > 7x normal, only one had a confirmatory test (PCR or RIBA).

PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases.

COMMENTS

Surveillance for acute hepatitis C aims to monitor ongoing transmission of HCV and conduct investigations of these cases to determine their characteristics and risk factors. This provides the best information for monitoring trends in transmission patterns. The collection of risk factor information is useful for characterizing groups at risk of infection and targeting prevention activities. Monitoring changes in acute disease incidence and in the risk factors for infection can be used to assess the effectiveness of hepatitis C prevention and control programs.

No cases of acute hepatitis C were confirmed in 2003. The decrease in acute hepatitis cases may be attributable to the adherence by LAC DHS to the stringent CDC/CSTE for acute hepatitis C. Many of the cases lacked a laboratory test (RIBA or PCR) that is necessary to confirm a case of hepatitis C. Therefore, increasing health care providers or laboratories about the importance of using the extra laboratory tests awareness may help to improve surveillance for acute hepatitis C.

ADDITIONAL RESOURCES

Further information about hepatitis is available from:

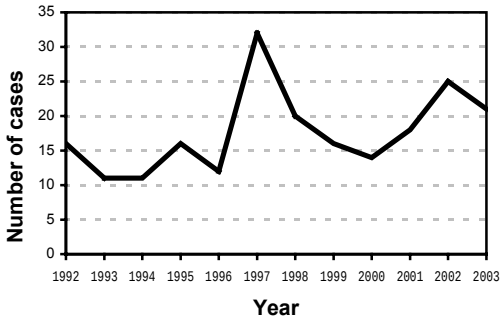
- American Liver Foundation – www.liverfoundation.org
- International Liver Foundation – www.hepfi.org/infomenu.htm
- CDC – www.cdc.gov/ncidod/disases/hepatitis/

LEGIONELLOSIS

CRUDE DATA	
Number of Cases	21
Annual Incidence[a]	
LA County*	N/A
United States	N/A
Age at Diagnosis	
Mean	56
Median	59
Range	13-89 years
Case Fatality	
LA County	29%
United States	N/A

[a] Cases per 100,000 population.

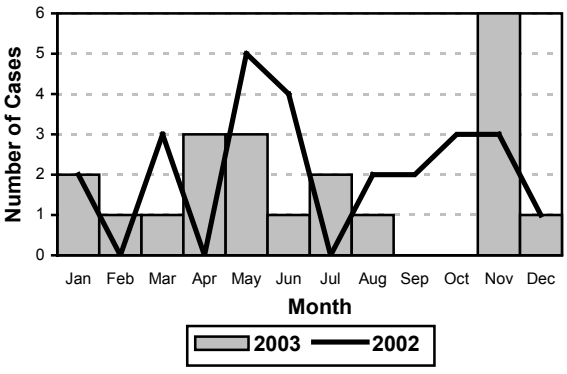
Figure 1
Legionellosis
Cases by Year of Onset
LAC, 1992–2003



DESCRIPTION

Legionellosis is a bacterial infection with two distinct clinical forms: 1) Legionnaires' disease (LD), the more severe form characterized by pneumonia, and 2) Pontiac fever, an acute-onset, self-limited flu-like illness without pneumonia. *Legionella* bacteria are common inhabitants of aquatic systems and thrive in warm environments. Ninety percent of cases of LD are caused by *Legionella pneumophila,* although at least 11 other species and a number of serogroups are known to cause disease in humans. Transmission occurs through inhalation of aerosols containing the bacteria or by aspiration of contaminated water. Person-to-person transmission does not occur. The case fatality rate for LD ranges from 5%–15%, but can be higher in outbreaks occurring in a hospital setting. People of any age may get LD, but the disease most often affects middle-aged and older persons, particularly those who are heavy smokers, have chronic lung disease, or whose immune system is suppressed by illness or medication.

Figure 2
Legionellosis
Cases by Month of Onset
LAC, 2002–2003



DISEASE ABSTRACT

- As in previous years, the incidence of Legionellosis in LAC was below national levels.
- One definite nosocomial case was reported in 2003.
- There were no cases of Pontiac fever.
- The case fatality increased from 12% in 2002 to 29% in 2003.

STRATIFIED DATA

Trends: Twenty-one reported cases met the CDC surveillance case definition for LD in 2003. This is noticeably lower than the peak incidence of 32 cases reported in 1997 (Figure 1).

Seasonality: Ten cases 48% occurred during the summer and autumn months (June through November) whereas eleven (52%) occurred during the winter and spring Figure 2.

Age: Consistent with the expected higher frequency among older persons, the mean age of reported cases was 56 years, the median age 59 years, and the range was 13–89 years.

Fatality: the 2003 case fatality of 29% is higher than in 2002, 16%. The mean age of expired cases was 72 the median age 74, and the range was 57-89 years.

Gender: There were twelve (57%) male cases and nine (43%) female cases. Disproportionately higher rates of Legionellosis occurred among males, a consistent finding for LAC and national surveillance data. Both cigarette smoking and older age are recognized risk factors for LD. An explanation often offered to explain the gender disparity for LD is the higher prevalence of cigarette smoking among males in the older age groups. The gender disparity in prevalence of smoking in the older age groups is expected to narrow or disappear in the near future, as it has among younger age groups.

Race: The majority of cases (n=14, 67%) occurred in Whites. The next most frequently reported racial group was Black (n= 5, 24%), followed by Asian (n=1, 5%),

Ethnicity: Not Hispanic (n=12, 57%), Hispanic (n=5, 24%), Unknown (n=4, 19%)

COMMENTS

In 2003, one case (5%) was confirmed by direct fluorescent sputum staining and 20 (95%) by urine antigen testing alone. Legionella pneumophilla serogroup 1 was implicated in all but one of the case, possibly reflecting increased use of urine antigen testing, which is specific for Lp1. The proportion of cases of *Legionella* diagnosed by urinary antigen increased from 20 (80%) cases in 2002 to 20 (95%) cases in 2003. It is possible that this relatively easy diagnostic test may contribute to increased diagnosis of Legionellosis in the future since clinicians are using this test more frequently.

There were no Legionellosis outbreaks reported in 2003. One definite and one probable nosocomial cases occurred at two separate medical facilities that were not outbreak associated and were not investigated.

The number of cases of Legionellosis in LAC remains lower than expected based on national surveillance data and other epidemiologic studies. Empiric treatment for community-acquired pneumonia without specific testing for *Legionella pneumophia*, inappropriate laboratory testing (use of a single serologic antibody titer testing without convalescent titers), and underreporting by physicians are possible explanations.

ADDITIONAL RESOURCES

Guidelines:

- CDC. Guidelines for prevention of nosocomial pneumonia. MMWR 1997; (RR-1):1–79. www.cdc.gov/ncidod/diseases/hip/pneumonia/pneu_mmw.htm

- Allegheny County Health Department. Approaches to prevention and control of Legionella infection in Allegheny County health care facilities. 2nd ed. Pittsburgh, PA: Allegheny County Health Department. 1997:1–15. www.legionella.org

- State of Maryland, Department of Health and Mental Hygiene. Report of the Maryland Scientific working Group to Study *Legionella* in Water Systems in Healthcare Institutions. June 14, 2000, Baltimore, Maryland. www.dhmh.state.md.us/html/legionella.htm

- ASHRAE. Guideline 12-2000. Minimizing the risk of legionellosis associated with building water systems. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta, GA., 1999. www.ASHRAE.org or www.baltimoreaircoil.com/index1.html

- LAC DHS. Legionellosis: Taking the Mystery out of Laboratory Diagnosis. The Public's Health. 2001;1(3):4. Available at: www.lapublichealth.org/wwwfiles/ph/ph/ph/TPH_October_2001.pdf

Reviews:

- Stout JE, Yu VL; Legionellosis. N Engl J Med 1997; 337:682–687.

- Breiman RF, Butler JC: Legionnaires' disease: clinical, epidemiological, and public health perspectives. Semin Respir Infect 1998; 13:84–89.

Selected Articles:

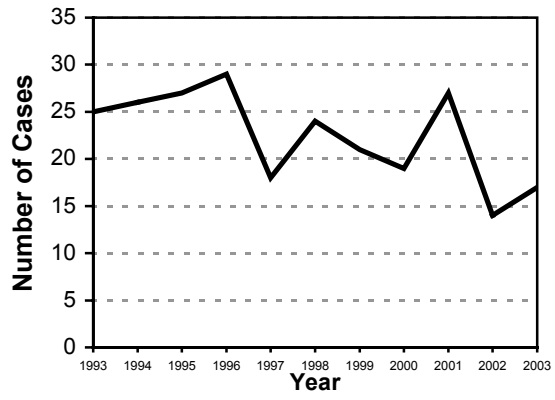
- Lin YS, Stout JE, Yu VL, Vidic RD. Disinfection of water distribution systems for *Legionella*. Semin Respir Infect 1998; 13:147–59.

- Yu VL. Resolving the controversy on environmental cultures for *Legionella:* A modest proposal. Infect Control Hosp Epidemiol 1998; 19:893 -7.

LISTERIOSIS, NONPERINATAL

CRUDE DATA	
Number of Cases	17
Annual Incidence [a]	
LA County	---[b]
United States	N/A
Age at Diagnosis	
Mean	65
Median	65
Range	18–96 years
Case Fatality	
LA County	24%
United States	N/A

Figure 1
Nonperinatal Listeriosis
Cases by Year of Onset
LAC, 1993–2003



[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.

DESCRIPTION

Listeriosis is a disease transmitted primarily through consumption of food contaminated with *Listeria monocytogenes,* a gram-positive bacterium. *L. monocytogenes* is found in soil and water, and can contaminate raw foods (e.g., uncooked meats and vegetables), as well as processed foods that become contaminated after processing (e.g., soft cheeses and cold cuts). Unpasteurized (raw) milk and foods made from unpasteurized milk may also contain the bacterium. Common symptoms of listeriosis include fever, muscle aches, headache, nausea, diarrhea, and neck stiffness. A case of nonperinatal listeriosis is one that occurs in persons other than pregnant women and/or their fetuses, neonates, or infants up to 42 days after birth. Historically, nonperinatal listeriosis presents as meningoencephalitis and/or septicemia, primarily affecting elderly and immunocompromised persons, such as those with cancer or HIV, and those on immunosuppressive therapy.

DISEASE ABSTRACT

- In 2003, 17 nonperinatal listeriosis cases were reported, a 21% increase from the previous year (N=14) but the second lowest incidence in 10 years (Figure 1).
- There were four case fatalities due to listeriosis in 2003. Three of the four were the oldest of all 17 nonperinatal listeriosis cases (>86 years of age). Two case fatalities occurred during the previous year and the 2003 case fatality rate increased substantially, from 14% to 24%.
- Listeriosis cases typically follow a seasonal trend with cases increasing during the summer months. During the previous five years, the highest incidence of cases occurred during June. Except for having no cases in June, 2003 followed the typical seasonal trend (Figure 2).
- There were no foodborne listeriosis outbreaks during 2003.

STRATIFIED DATA

Trends: Although there was a slight increase in cases from 2002 to 2003, the incidence of nonperinatal listeriosis was the second lowest in 10 years. However, case fatality has been increasing from 7% (2/27) in 2001, to 14% (2/14) in 2002, to 24% (4/17) in 2003.

Seasonality: In the previous five years, the average number of reported cases was greatest in June. However, in 2003, there were no cases in June and similar to 2002 the majority of cases occurred during the second half of the year (Figure 2).

Age: Advanced age is considered a risk factor for nonperinatal listeriosis. In 2003, a greater percentage of cases (53%, n=9) were 65-years of age or older—an increase compared to 2002 (43%) and 2001 (33%). In 2003, 24% (n=4) of cases were 55 to 64 years of age (Figure 3).

Sex: Like in 2002, more males contracted nonperinatal listeriosis; the male-to-female incidence ratio was 10:7.

Race/Ethnicity: In 2003, Whites had the highest number of incident cases of nonperinatal listeriosis (n=9). Latinos had the second highest number of new cases (n=6) followed by Asians (n=2). There were no Black cases reported in 2003 (Figure 4). This pattern of incidence by race is almost identical to that of 2002.

Location: During 2003, there was no significant clustering of cases by location. However, a geographic map with nonperinatal and perinatal cases showed that about one-third of these cases occurred in the San Fernando Valley.

Predisposing Conditions and Medical Risk Factors: As mentioned, many of the nonperinatal cases occurring in 2003 (n=9, 53%) were older than 65 years of age. In addition, nearly half of the cases (n=8, 47%) were diagnosed with cancer, many of which were on chemotherapy (n=7) or steroid medication (n=5). Three of the four cases with kidney disease also had diabetes. Only one case in 2003 did not have a known-risk factor for listeriosis (Table 1).

High-risk Foods: Cases reported eating Mexican-style cheese (n=4, 24%), soft cheese (n=4, 24%), other types of cheese (n=3, 18%), unpasteurized

Figure 3
Nonperinatal Listeriosis Incidence
by Age Group
LAC, 2003

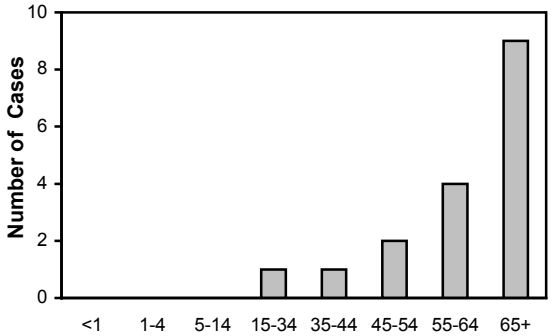


Figure 2
Nonperinatal Listeriosis
Cases by Month of Onset
LAC, 2003

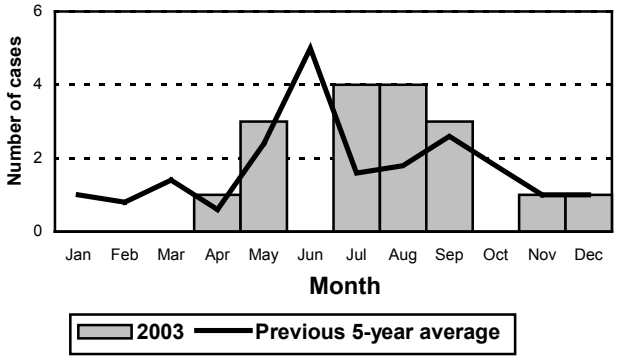
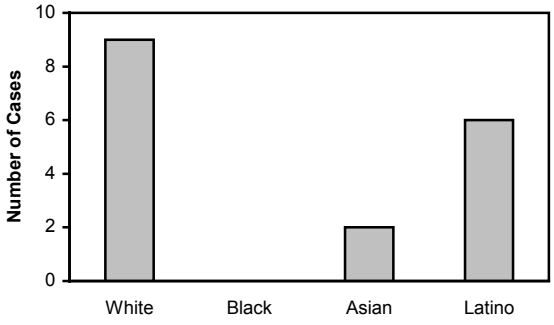


Figure 4
Nonperinatal Listeriosis
Incidence by Race/Ethnicity
LAC, 2003



milk products (n=1, 6%), raw beef (n=2, 12%), cold cuts (n=2, 12%), raw fruits (n=4, 24%), raw vegetables (n=5, 29%), and yeast (n=1, 6%).

Outcome: Four (24%) of the 17 cases in 2003 died.

Culture Sites: *L. monocytogenes* was isolated from blood and CSF in two (12%) cases, blood only in 13 (76%) cases, CSF only in one case (6%), and pleural fluid in one case (6%).

PREVENTION

In general, listeriosis may be prevented by thoroughly cooking raw food from animal sources, such as beef, pork, or poultry; washing raw vegetables thoroughly before eating; and keeping uncooked meats separate from vegetables, cooked foods, and ready-to-eat foods. Avoiding unpasteurized milk or foods made from unpasteurized milk, and washing hands, knives, and cutting boards after handling uncooked foods also may prevent listeriosis.

Persons at high risk for listeriosis include the elderly, those with cancer, HIV, diabetes, weakened immune systems, and those on immunosuppressive therapy. These individuals should follow additional recommendations: avoid soft cheeses such as feta, brie, camembert, blue-veined, and Mexican-style cheese. Hard cheeses, processed cheeses, cream cheese, cottage cheese, or yogurt need not be avoided. Leftover foods or ready-to-eat foods, such as hot dogs, should be cooked until steaming hot before eating. Finally, although the risk of listeriosis associated with foods from deli counters is relatively low, immunosuppressed persons may choose to avoid these foods or thoroughly reheat cold cuts before eating.

Table 1. Predisposing Factors in Cases of Nonperinatal Listeriosis—LAC, 2003

Medical Conditions	Number	Percent
Age >65 years	9	53
Cancer	8	47
Chemotherapy	7	41
Steroid Use	6	35
Diabetes	4	24
Kidney Disease	4	24
Chronic Alcoholism	3	18
Radiation Therapy	3	18
Autoimmune Disease	2	12
Liver Disease	2	12
Lung Disease	2	12
Prior Antibiotic Use	2	12
Antacid Use	1	6
Asthma	1	6
Gastrointestinal Disease	1	6
HIV+/AIDS	1	6
Other Immunosuppressive Therapy	1	6
Organ Transplant	1	6
No Identified Risk Factors	1	6

COMMENTS

2003 had the second lowest incidence rate for listeriosis in at least 10 years. This decline may be attributable to better food safety handling and/or packaging, improved education and knowledge from experience with *L. monocytogenes*. Similar to last year, there were no foodborne *L. monocytogenes* outbreaks. Another contributing factor may be variations in reporting and hospital laboratory testing practices. Foodborne illnesses both locally and nationwide have decreased substantially in recent years. Whether this represents a real decrease in disease, a reduction in laboratory testing and/or reporting, or both remains to be determined.

L. monocytogenes still appears to be an opportunistic disease targeting people who are very ill and/or weaker in fighting off infections. The four case fatalities included the three oldest cases (≥87 years) and one person who was a heavy smoker that had not seen a doctor in many years and was discovered to have metastatic adenocarcinoma upon hospitalization. All nonperinatal cases in 2003 except one had at least one predisposing health condition that might lead to a weaker immune system. Thirteen cases (76%) had more than one medical risk factor identified.

All *L. monocytogenes* isolates are now analyzed by pulsed field gel electrophoresis (PFGE). There were no LAC outbreaks or LAC cases associated with a multi-jurisdictional outbreak identified in this manner in 2003.

ADDITIONAL RESOURCES

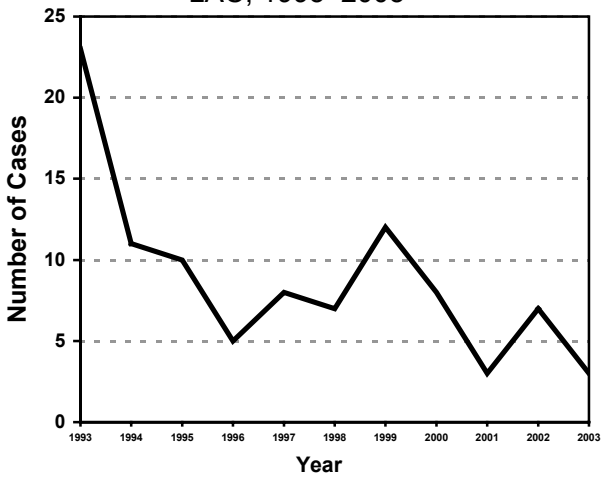
General disease information is available from the CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/listeriosis_g.htm

General information and reporting information about this and other foodborne diseases in LAC is available at: www.lapublichealth.org/acd/food.htm

LISTERIOSIS, PERINATAL

CRUDE DATA	
Number of Cases [a]	3
Annual Incidence [b] LA County United States	 ---[c] N/A
Age at Onset Maternal: Mean Median Range Infant Gestational: Mean Median Range	 33 years 36 years 24-40 years 34 weeks 37 weeks 27-38 weeks
Case Fatality LA County United States	 33%[d] N/A

Figure 1
Perinatal Listeriosis
Cases by Year of Onset
LAC, 1993–2003



[a] Cases are mother-infant pairs.
[b] Cases per 100,000 population.
[c] Rates based on less than 20 observations are unreliable.
[d] Among fetal/neonate cases only, no maternal deaths included.

DESCRIPTION

Perinatal listeriosis is a disease transmitted transplacentally from infected pregnant women; these women may experience only mild flu-like symptoms or may be asymptomatic. A perinatal listeriosis case is defined as a mother-infant pair in which one or both persons has a positive *Listeria monocytogenes* culture from a normally sterile site. Neonatal/infant listeriosis is divided into early onset (0–6 days after birth) and late onset (7–42 days after birth). Infection during pregnancy may lead to premature birth, stillbirth, or septicemia and/or meningitis in the neonate—even if the mother is asymptomatic. There is no vaccine to prevent listeriosis.

DISEASE ABSTRACT

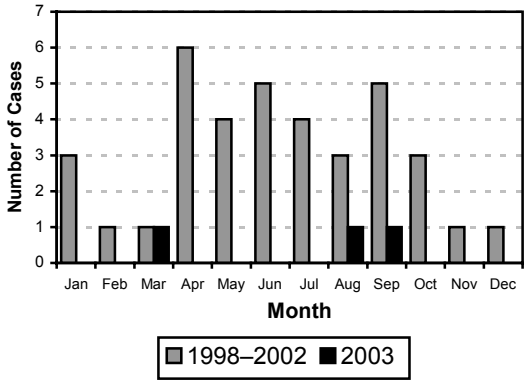
- Perinatal listeriosis decreased from 23 cases to 11 cases in 1994 and has generally continued to decrease (Figure 1).
- Of the affected infants, one died after birth at 27 weeks of gestation, and two were born alive and asymptomatic at 37 and 38 weeks of gestation. The infants born in weeks 27 and 37 had positive blood cultures for *L monocytogenes*.

STRATIFIED DATA

Trends: Perinatal listeriosis increased from three cases in 2001 to seven cases in 2002; however, the number of cases decreased to three in 2003 (Figure 1).

Seasonality: From 1998 to 2002, incidence peaked in January, April, June, and September. Higher levels of incidence occurred between April and October (Figure 2). In 2003, cases occurred in early spring and late summer.

Figure 2
Number of perinatal listeriosis cases
by month of onset
LAC, 1998–2003



Age: During 2003, the average maternal and gestational ages of perinatal cases (33 years and 34 weeks, respectively) were slightly higher compared to those in 2002 (28 years and 32 weeks). The one fatality in 2003 was born to a 24-year-old woman after 27 weeks of gestation.

Sex: In 2003, infant cases were two males (67%) and one female. The male that died and the female had positive blood cultures for *L monocytogenes*. In 2002, of six newborns, two (33%) were male; of the two positive isolates from newborns, one male had a blood culture and one female had a lung fluid culture.

Race/Ethnicity: The male that died and the female were Hispanic (67%); the remaining infant was White. Of the seven 2002 perinatal cases, five (71%) were Hispanic and one (14%) was White.

Location: The two perinatal cases that survived were from West Los Angeles: the Hollywood-Wilshire health district (SPA 4) and the West / Burke health district (SPA 5). The other case was from the Pomona health district (SPA 3).

Type of Delivery: The male infants were delivered by caesarian section, and the female was delivered vaginally.

Outcome: All mothers survived; one (33%) infant died.

Culture Sites: Of the three births, two infants (67%) had blood taken only and the surviving male infant (33%) had CSF taken in addition to blood (see Table 1 for results). The mothers of the male children had blood tested for *L. monocytogenes* and only the mother with the surviving infant tested positive. In 2002, of seven perinatal cases, three (43%) newborns/fetuses had blood and CSF cultures, one had only blood culture, one had heart fluid and lung fluid cultured, and two had no cultures done. Four (57%) mothers had positive blood cultures, another mother had positive nasopharyngeal and umbilical cord cultures, and two mothers (29%) were missing culture information.

Onset: In 2003, all cases were classified as early-onset (0–6 days after birth).

High-risk Foods: When high-risk foods were assessed as possible causes for infection, all mothers reported consumption of Mexican cheese or soft cheese, and one also reported consumption of raw fruits and vegetables.

Risk factors: Other than pregnancy, the mother of the non-surviving infant had no other known risk factors. The mother of the female infant reported excavation around home and the mother of the surviving male infant reported chronic alcoholism.

Table 1. Reported results* for *Listeria monocytogenes* isolates from Mothers and Infants—LAC, 2003

	Positive cultures			
	Mother (n=3)		Infant (n=3)	
Culture Site	Number	Percent	Number	Percent
Blood	1	33	2	67
CSF	0	0	0	0

* Percentages may exceed 100% as cultures were obtained from more than one site in some cases.

PREVENTION

L monocytogenes is found in soil and water. Animals can carry *Listeria* without appearing ill, which can result in contaminated foods of animal origin, such as meats and dairy products. In particular, studies have implicated unpasteurized milk or milk products ; soft cheeses (Mexican-style, Brie, Feta, blue-veined, Camembert); undercooked meat, such as beef, pork, poultry, and paté; and cold cuts from deli counters. Pregnant women should avoid these foods. In particular, cheese sold by street vendors, or obtained from relatives/friends in other countries where food processing quality assurance is unknown should be avoided by pregnant women.

In addition, fruits and vegetables should be thoroughly washed. Uncooked meats should be stored separately from vegetables, cooked foods, and ready-to-eat foods. Hands, utensils, and cutting boards should be washed after handling uncooked foods. Leftover foods or ready-to-eat foods, such as hot dogs, should be cooked until steaming hot before eating. Finally, although the risk of listeriosis associated with foods from deli counters is relatively low, pregnant women may choose to avoid these foods or thoroughly reheat cold cuts before eating.

Given the seasonality of perinatal listeriosis, prevention strategies should take effect before April. Possible preventive methods include education during pregnancy checkups, outreach in Hispanic/Latino communities, and food safety notices at food and deli markets.

COMMENTS

Incidence of perinatal listeriosis in LAC is less than ten cases per year for the fourth consecutive year. Although only three cases occurred in 2003, Hispanic women still seem to be a good target for prevention, particularly because Hispanics are the fastest growing segment of the LAC population. There were no perinatal cases associated with outbreaks in 2003.

All isolates of *L. monocytogenes* are typed by pulsed-field gel electrophoresis (PFGE), a technique to detect matching strains of various pathogenic agents. When matches between isolates from patients or foods are detected, an investigation may be initiated. In addition, a solitary case occurring locally can be linked by PFGE results to an outbreak occurring on a wider geographical scale. In 2003, there were no cases of *L. monocytogenes* in LAC associated with a multi-jurisdictional outbreak identified in this manner.

ADDITIONAL RESOURCES

General disease information is available from the CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/listeriosis_g.htm

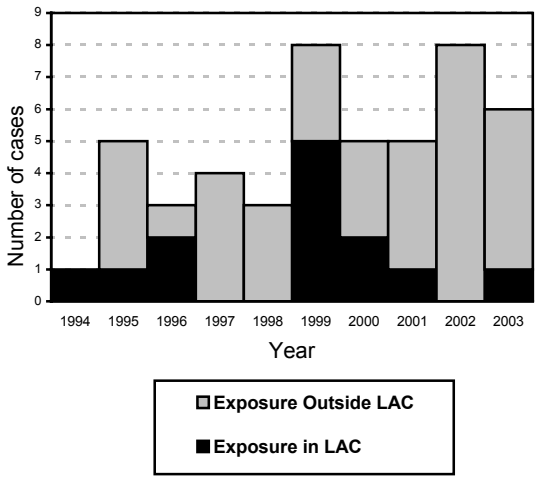
General information and reporting information about this and other foodborne diseases in LAC is available at: www.lapublichealth.org/acd/food.htm

LYME DISEASE

CRUDE DATA	
Number of Cases	6
Annual Incidence[a]	
LA County	---[b]
California	0.25
United States	7.39
Age at Diagnosis	
Mean	37
Median	31
Range	6–55 years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.
[b] Rates based on fewer than 20 cases are unreliable.

Figure 1
Lyme Disease
Exposure Site by Year 1994–2003



DESCRIPTION

Lyme disease is caused by a bacterium, *Borrelia burgdorferi*, transmitted to humans by the bite of the western blacklegged tick (*Ixodes pacificus*). This disease is not common in LAC. The reservoir is in small rodents, with deer as a secondary reservoir. Ticks that feed from infected rodents or deer may then transmit the disease to humans, who are accidental hosts. The classic rash is called erythema migrans, an expanding "bull's eye" rash, which is the first sign in about 60–90% of patients (usually at the site of the tick bite.). The incubation period is from 3–32 days. However, early symptoms (e.g., fever, body aches, headaches and fatigue) are often unrecognized and patients may present with later manifestations. These include aseptic meningitis, cranial neuritis, cardiac arrhythmias and arthritis of the large joints. Early disease is treated with a short course of oral antibiotics, while later manifestations may require longer treatment with oral or intravenous (IV) antibiotics. Currently, there is no vaccine.

The diagnosis of Lyme disease may be difficult because other diseases can cause early symptoms of fever, body aches, headaches, and fatigue. Laboratory tests are available, but they are often not sensitive, specific or consistent.

Lyme disease may be cured by early diagnosis and treatment with antibiotics. Untreated disease causing long-term illness and complications may occur, requiring longer treatment with oral or IV antibiotics.

DISEASE ABSTRACT

- In 2003, 6 reported cases met CDC surveillance criteria. Four were male and two were female.
- All cases except 1 reported exposure outside LAC. The reported one LAC Lyme case noted tick exposure in Malibu.

COMMENTS

Lyme disease is now the most frequently reported vectorborne disease in the US; however, it is reported infrequently in LAC. Since Lyme disease became reportable in 1989, 48 reported cases have met the CDC surveillance criteria. Sixteen cases (28%) were exposed to ticks inside LAC. Although transmission of Lyme disease does occur in LAC, it is believed to be rare because the western blacklegged tick is not the most common tick in LAC, and only 1–2% of western blacklegged ticks in California are infected with the bacterium that causes Lyme disease. The tick must be attached for a minimum of 48 hours for transmission to occur. Although DHS has been testing ticks and reservoir animals for the past eleven years, 1999 was the first year for which ticks were confirmed to carry *B. burgdorferi* by culture.

When a case of Lyme disease is reported to the DHS, an investigation is initiated by ACDC, which includes collection of information from the physician and the patient. Vector Management staff determine the probable site of tick exposure and initiate field studies. Field studies include collection of ticks and samples from animals to test for Lyme disease.

Although Lyme disease occurs rarely in LAC, personal protective measures are recommended to prevent tick bites. These include: using insect repellents containing DEET, wearing long pants and long-sleeved clothing, wearing light-colored clothing (so that ticks can be spotted more easily) and walking in the center of a trail to avoid overhanging grass or brush.

Future Directions

The vaccine made by SmithKline Beecham (LYMErix) was taken off the market in 2001 due to poor sales and possible side effects and complications. Efforts are being made to develop a new vaccine.

ADDITIONAL RESOURCES

More information about Lyme disease is available from the CDC at:
www.cdc.gov/ncidod/dvbid/lyme/index.htm

A brochure regarding Lyme disease is from the California DHS is avilable at:
www.dhs.ca.gov/ps/dcdc/disb/pdf/Lyme%20Disease%20brochure%20final.pdf

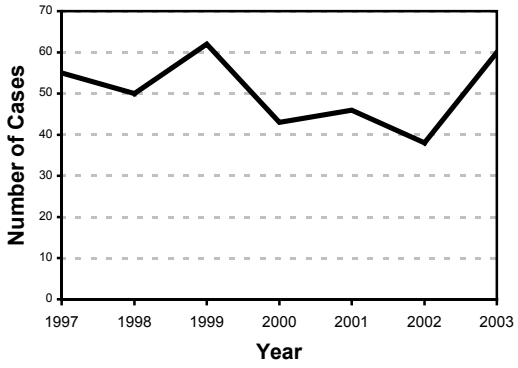
Publications:

- Nadelman RB and Wormser GP. Lyme borreliosis. Lancet. 1998; 352: 557–65.
- Barbour AG. Lyme Disease: The Cause, the Cure, the Controversy. 1996. The Johns Hopkins University Press, Baltimore, MD.
- Steere AC. Lyme disease. N Engl J Med. 2001; 345(2): 115–125.
- Sood SK. Lyme disease. Pediatr Infect Dis J. 1999; 18: 913–25.

MALARIA

CRUDE DATA	
Number of Cases	60
Age at Onset Mean Median Age Range	 34 32 8–74 years
Case Fatality LA County United States	 0.0% N/A

Figure 1
Malaria
Cases by Year
Los Angeles County, 1997–2003



DESCRIPTION

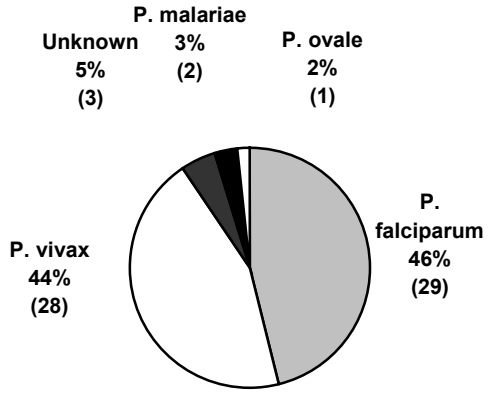
Malaria is a disease acquired outside the continental US through travel and immigration and is rarely transmitted within the US. The last autochthonous cases occurred in San Diego, California in 1988-1989 among migrant workers. A total of thirty workers became infected with *Plasmodium vivax (P.vivax)*.

Human malaria is an illness caused by one or more plasmodia that infect humans: *P. vivax*, *P. falciparum, P. malariae*, and *P. ovale*. *P. falciparum* is found primarily in tropical regions and poses the greatest risk of death because it invades red blood cells of all stages and is often drug-resistant. Malaria is acquired from the bite of an infective female *Anopheles* mosquito. Malaria is not transmitted locally in LAC, although a particular mosquito, *Anopheles hermsi*, exists here and is capable of transmitting the parasite.

DISEASE ABSTRACT

- The number of malaria cases in LAC increased from 38 cases in 2002 to 60 in 2003 (Figure 1).
- The percent of malaria cases who were US residents decreased slightly from 58% (22/38) in 2002 to 56% (33/59) in 2003.
- The percent of malaria cases who were recent immigrants, visitors to the US, or whose residency status was unknown increased slightly from 42% (16/38) in 2002 to 45% (27/60) in 2003.
- Of the 41 US resident cases, only 21, or approximately 50%, had taken some form of prophylaxis during travel to a malaria-endemic region (Table 2).

Figure 2
Malaria Cases by Species
LAC, 2003



STRATIFIED DATA

Species Frequency: The infecting malarial species was identified for 57 cases (95%, Figure 2); 29 cases were infected with *P. falciparum*, 28 with *P. vivax*, 2 with *P. malariae* and 1 *P. ovale.* Three cases were unspecified (Figure 2).

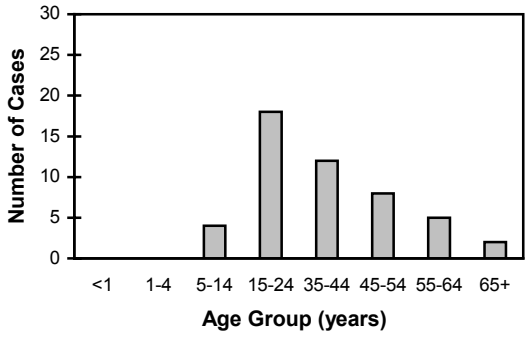
Seasonality: Seasonality for malaria was not determined, as malaria is a disease that is acquired abroad and is independent of LAC weather or seasonal patterns.

Age: Most cases occurred in individuals aged 15-24, (18 cases or 30%) followed by those between 35 to 44 years (12 cases or 20%). Mean age of infection was 33.6 years, median age was 32, and the age range was 8-74 years old.

Sex: The rate ratio of male-to-female cases was nearly two to one (1.9:1).

Race/Ethnicity: Whites or Caucasians comprised the most number of cases, 29/58 or 50%, followed by African Americans/Blacks (including African Nationals) (21/58 or 36%), and Asian/Pacific Islanders with 8 cases out of 58, or 14%. The race of two cases was unknown. The non-Hispanic/nonLatino ethnic group had the highest number of cases, 43/60 or 72%.

Figure 3
Malaria
Cases by Age Group
LAC, 2003



Fatalities: There were no deaths due to malaria in 2003.

COMMENTS

In LAC, malaria is a disease related to travel and immigration. More than half of all malaria cases among LAC residents were acquired in Africa. There is no recent documentation of malaria being transmitted locally, but a mosquito does exist in LAC that is capable of transmitting the parasite. Local transmission has not occurred here due to an inadequate number of people infected with the malaria parasite to sustain disease transmission. Additionally, the mosquito capable of transmitting malaria is very rare.

The majority of malaria cases (n=34, 57%) were LAC residents who traveled abroad either for work or vacation. Sixteen cases (42%) were recent immigrants, individuals visiting the US, or those whose residency status was unknown. Residency was defined as those who lived in the US for twelve months or longer. The reason for the overall increase in malaria cases is most likely due to an increase in travel and immigration. The number of malaria cases overall is still far below the number of cases seen throughout the late 1970s through 1986 (an average of 133 malaria cases reported annually from 1979-1986).

Among US travelers who returned with malaria infection, Africa remains the most common region visited. Thirty-three (55%) of all reported malaria cases were from individuals who were US residents and non-residents traveling to or coming from African countries (Table 1). Since the early 1990s, Blacks, including African nationals and African Americans, have been the ethnic group with the highest incidence of malaria in LAC. In 2003, however, Caucasians outnumbered Blacks in malaria cases.

Prior to the 1990s, immigrants/refugees from Central America and Southeast Asia made up the majority of all malaria cases seen in LAC. Of the reported cases in 2003 from non-US residents, the majority of cases were Caucasian with Hispanic ethnicity (10/19). All were either visiting the US or immigrating. Seven cases of the nineteen were African American or Black.

Anti-malarial prophylaxis use was available for all of the 41 US residents, which includes 40 civilians and one military personnel. Twenty individuals took prophylaxis (49%), compared to only 7 of 22 from the previous year (Table 2). However, eleven cases (55%) reported not completing their medication. While four (20%) cases did finish their medication, 2 cases were unsure what type of medication they were prescribed, one case was given inappropriate prophylaxis, and one case had a previous history of plasmodia infection. Out of those cases who did take prophylaxis, three malaria cases had a previous malaria history within twelve months prior to onset of current infection. One case acquired malaria in

India, one in Afghanistan or Iraq (case traveled to both countries), and one in India. There was one case attributed to Malaria relapse (malaria and history of travel to Cambodia and Thailand) No cases were acquired through blood transfusion.

Table 1. Malaria Cases by Country of Acquisition and Plasmodium Species—LAC, 2003

Country of Acquisition	*P. falciparum*	*P. vivax*	*P. malariae*	*P. ovale*	Unknown	Total
Africa						
- Cameroon	1	0	0	0	0	1
- Ethiopia	0	1	0	0	0	1
- Gambia	1	0	0	0	0	1
- Ghana	5	2	0	0	1	8
- Kenya	3[a]	0	0	0	1	4
- Nigeria	12	1	0	0	1	14
- Sierra Leone	1	0	0	0	0	1
- South Africa	1[b]	0	0	0	0	1
- Uganda	0	1	0	1	0	2
Total	**24**	**5**	**0**	**1**	**3**	**33**
Latin America						
- El Salvador	1	1	0	0	0	1
- Guatemala	1	2[c]	0	0	0	3
- Honduras	1	2	0	0	0	3
- Mexico	0	2	0	0	0	2
- Nicaragua	0	0	1	0	0	1
Total	**3**	**7**	**1**	**0**	**0**	**11**
Asia/Oceania						
- India	4	1	1	0	0	6
- Indonesia	0	1	0	0	0	1
- Papua New Guinea	0	1	0	0	0	1
- Pakistan	1	1	0	0	0	2
- Philippines	0	0	0	0	1[e]	1
- Solomon Island	0	1	0	0	0	1
- Thailand	0	1	0	0	0	1
- Vietnam	0	1	0	0	0	1
Total	**5**	**7**	**1**	**0**	**1**	**14**
Middle East						
- Iraq	0	2	0	0	0	2
Total	**0**	**2**	**0**	**0**	**0**	**2**
Overall Total	**40**	**19**	**2**	**1**	**4**	59

[a] One case also traveled to Uganda.
[b] Case also traveled to Mauritius and Zambia.
[c] Two cases also traveled to Mexico.

Table 2. Malaria Prophylaxis Use Among US Residents, 2003			
Reason for Travel	Malaria Cases (N)	Cases That Used Prophylaxis (N)	Prophylaxis Use (%)
Pleasure	27	10	37%
Work	11	8	72%
Other/Unknown	3	2	67%
Total	**41**	**20**	**49%**

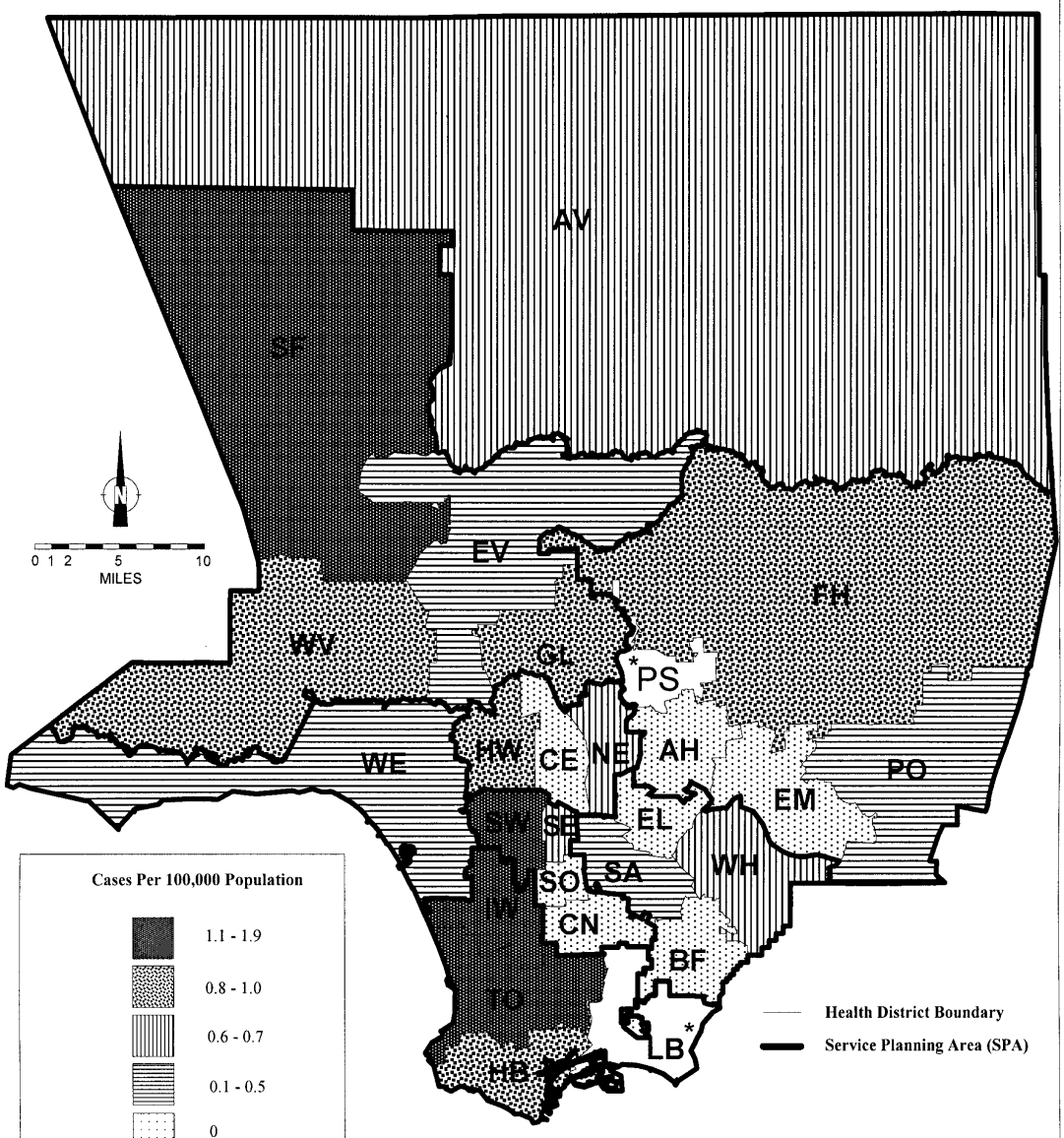
ADDITIONAL RESOURCES

Additional information about malaria is available from the CDC at:
CDC website: www.cdc.gov/ncidod/dpd/parasites/malaria/default.htm

CDC. Malaria Surveillance—United States, 2002. MMWR 2004. SS-1: 21-33. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/ss5301a2.htm

CDC. Transmission of Plasmodium vivax Malaria—San Diego County, California, 1988 and 1989. MMWR 1990. 39: 91-94. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00001559.htm.

MAP 9. Malaria
Rates by Health District, Los Angeles County, 2003*



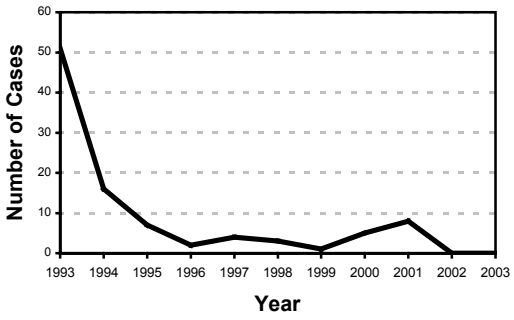
*Excludes Long Beach and Pasadena Data.

MEASLES

CRUDE DATA	
Number of Cases	0
Annual Incidence	
LA County	0
California	N/A
United States	0.01
Case Fatality	
LA County	0.0%

[a] Rates based on less than 19 observations are unreliable.

Figure 1
Measles
Reported Cases by Year of Onset
LAC, 1993–2003



DESCRIPTION

Measles is a vaccine-preventable disease caused by a paramyxovirus and is transmitted by contact with respiratory droplets or by airborne spread. Common signs and symptoms of measles include fever, cough, conjunctivitis, runny nose, photophobia, Koplik spots, and a generalized maculopapular rash. Severe complications are rare, but can include acute encephalitis and death from respiratory or neurologic complications. Immunocompromised individuals are more likely to develop complications. All persons who have not had the disease or who have not been successfully immunized are susceptible. The minimum clinical criteria for measles are fever of at least 101°F, a generalized rash lasting at least three days, and either cough, coryza, conjunctivitis, or photophobia. A case is confirmed by positive IgM titers or a four-fold increase in acute and convalescent IgG titers.

DISEASE ABSTRACT

- From 133 measles reports received at the LAC Immunization Program and one work site that had a possibility of 24 exposed individuals, there were no confirmed measles cases identified in LAC during 2003.
- No confirmed cases of measles have been identified in LAC in both 2002 and 2003.
- During 2003, there were 0 reported cases in the US, of which, 5 cases were reported in California. This serves as a reminder that vigilance against measles is necessary and should continue in order to prevent the occurrence of new cases.

IMMUNIZATION RECOMMENDATIONS

- Measles disease can be effectively prevented by Measles-Mumps-Rubella (MMR) vaccine, given in accordance with recommendations from the CDC's Advisory Committee on Immunization Practices (ACIP).
- Usually, two doses of measles-containing vaccine are given via (MMR) vaccine. The first dose is recommended at 12 months of age. The second dose can be given as early as four weeks after the first dose, but is usually given at ages 4 to 6 years.
- Vaccination is recommended for those born in 1957 or later who have no prior MMR vaccination or history of disease. Proof of immunization with two MMR doses is recommended for health care workers and person attending post secondary educational institutions as well as others who work or live in high risk settings.
- Over 95% of those who receive the current live attenuated measles vaccine develop immunity.
- Women should not become pregnant within 4 weeks of vaccination.

- Individuals who are severely immunocompromised for any reason should not be given MMR vaccine.

STRATIFIED DATA

Over the past several years the incidence of measles has significantly decreased in LAC since a record high occurring in 1993 (Figure 1). With the exception of this year and 2002, the number of measles cases has been increasing since 1999.

COMMENTS

Because LAC is in many ways a “door-way” to the US for travelers and other persons coming from parts of the world where measles continues to circulate, it is important that an effective measles surveillance system be maintained in this local health jurisdiction. With the high measles vaccine coverage levels (exceeds 90% for children 19-35 months of age), indigenous measles cases are expected to be almost non-existent. The importation of measles, however, can result in sporadic measles activity as was noted in 2001 when at least 3 of the 8 cases that year were proven to have a foreign travel or foreign born connection.

The strength of LAC’s measles surveillance system is exemplified by the fact that 133 suspect measles cases were reported in 2003. Upon investigation of these suspects, none were found to actually be measles cases.

It is the policy of the LAC Immunization Program to immediately follow-up on all suspect measles cases that are reported in order to verify diagnosis, medical history information, immunization status, and past travel history. Physicians and suspect cases are contacted directly by phone to verify the diagnosis and determine if the minimum criteria for measles classification has been met. If any measles report(s) involve a school or a sensitive setting like a health care facility, a school nurse or a medical administrator is contacted to assist in investigative efforts and to immediately implement isolation procedures necessary for preventing the spread of the disease. Susceptible contacts are identified and offered MMR vaccination to prevent natural measles occurrence. If vaccine is contraindicated, immune globulin (IG) is given instead. IG is recommended for infants less than 6-months of age, pregnant women, and immunocompromised individuals.

Both clinical and laboratory tests are important in the diagnostic confirmation of the disease. Blood specimen collections are arranged for serological analysis if the physicians have not ordered them. The testing laboratory is contacted to obtain measles IgM and IgG antibody levels. Detection of both types of antibodies is important in disease testing. Measles IgM antibodies are detectable from 2-28 days after rash onset. The presence of IgG antibodies in the serum indicates prior exposure to measles, either by natural means or by immunization. However, if a four-fold rise in measles IgG titer level is evidenced from sera drawn two weeks apart, a recent measles infection is indicated.

In summary, the decline in the number of measles cases in LAC is attributable to both the effectiveness of the MMR vaccine, diligent surveillance activities, and the success of the various outreach and educational programs implemented by the LAC Immunization Program to improve vaccination coverage rates in the county.

ADDITIONAL RESOURCES

Additional information about measles is available at:

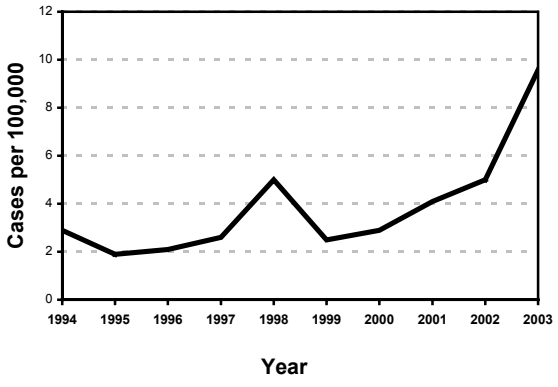
- National Immunization Program – www.cdc.gov/nip
- Immunization Action Coalition – www.immunize.org
- LAC, Immunization Program – www.lapublichealth.org/ip

MENINGITIS, VIRAL

CRUDE DATA	
Number of Cases	899
Annual Incidence	
LA County	9.57
United States	N/A
Age at Diagnosis	
Mean	21
Median	17
Range	<0–87 years
Case Fatality	
LA County	1.3%
United States	N/A

[a] Cases per 100,000 population.

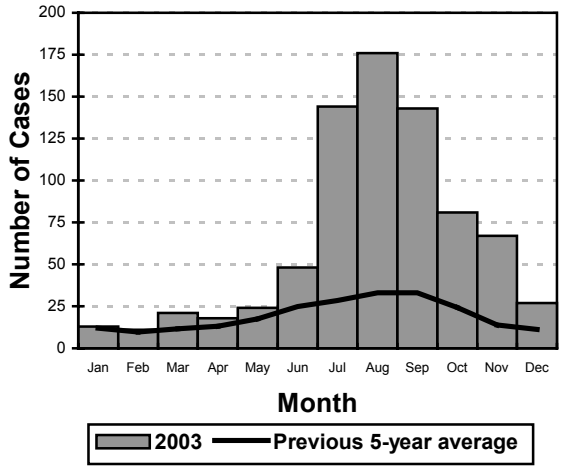
Figure 1
Viral Meningitis
Incidence Rates by Year of Onset
LAC, 1993–2003



DESCRIPTION

Viral meningitis, also referred to as aseptic meningitis, is a clinical syndrome in which no etiologic agent is identified on bacterial culture or examination of cerebrospinal fluid. Viral meningitis can occur at any age but is most common among the very young. Symptoms, which usually last from 7 to 10 days, are characterized by sudden onset of fever, severe headache, stiff neck, photophobia, drowsiness or confusion, nausea and vomiting. Treatment is usually supportive although antiviral agents may be helpful; recovery is usually complete. Enteroviruses, the etiologic agents commonly associated with viral meningitis, are not vaccine-preventable (except for polioviruses). Transmission of enteroviruses may be fecal-oral, respiratory or by another route specific to the etiologic agent.

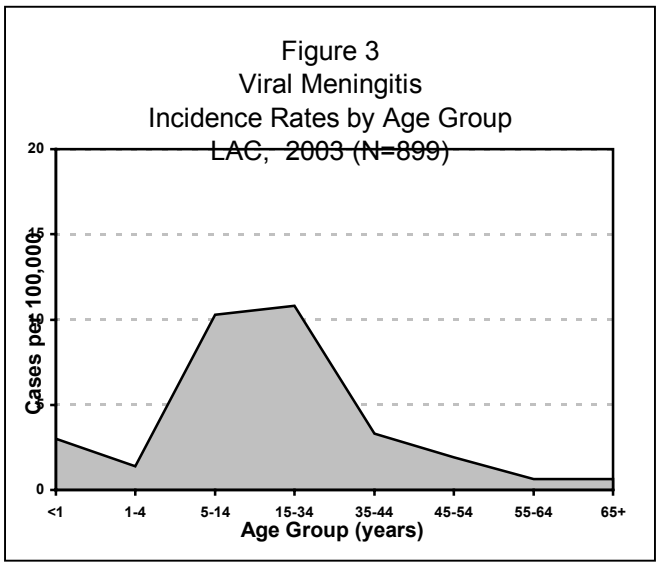
Figure 2
Viral Meningitis
Cases by Month of Onset,
LAC, 2003



DISEASE ABSTRACT

- In 2003, there were 899 cases of viral meningitis compared to 466 (93% increase) in 2002.
- The annual incidence was 9.6 per 100,000 compared to 5.0 per 100,000 in 2002 (Figure 1).
- The summer seasonal increase continued later into the year compared with the previous 5-year average (Figure 2).
- Arboviral infections such as West Nile virus, can present as aseptic meningitis.
- No unusual viral etiologies, associated cases, or clusters were reported in 2003.
- The highest age-group specific rate (10.8 per 100,000) was for those between the ages of 15-34 (Figure 3), as opposed to the previous year where infants under one year old were primarily affected (incident rate 34.4 per 100,000).

COMMENTS



Surveillance for viral meningitis is passive and only outbreaks, not individual cases, are investigated. The number of cases reported annually is considered to be significantly lower than the actual burden of disease. During the period of January 1, 2003 and August 7, the state of California's rate for aseptic meningitis was 8.0 per 100,000 population, reflecting a slight increase compared to previous years where the annual rate ranged from 4.5-7.3 (1999-2003). LAC saw an even larger increase in 2003. Ninety-three percent more cases of aseptic meningitis were reported resulting in 9.6 cases per 100,000 compared to 5 cases per 100,000 in 2002. The large increase could be explained by the re-emergence of two Enterovirus serotypes, E9 and E30, which had not been predominant since 1995 and 1998, respectively. It is probable that a large cohort had not been exposed to these serotypes and was susceptible to infection. Nationally, outbreaks of aseptic meningitis in 2003 have been associated with E9 and E30, E9 being predominant in the eastern US and E30 being predominant in the West. Reporting bias may also be partially responsible for the increase in cases. Increased surveillance for West Nile Virus was encouraged among health care providers and hospitals in 2003, which could account for an increase in reporting and diagnosis of aseptic meningitis.

Information about the causative agents of viral meningitis is rarely included with case reports because viral cultures and nucleic acid tests are not routinely performed at most medical facilities. When an etiology is determined, an enterovirus, most of which are transmitted through the fecal-oral route, is the most frequently identified agent. Improvements in molecular testing capabilities should lead to faster diagnoses and changes in the management of viral meningitis such as less use of inappropriate antibiotics.

Supportive measures, and to a lesser extent antiviral agents, are the usual treatments for viral meningitis. Good personal hygiene, especially handwashing and avoiding contact with oral secretions of others, is the most practical and effective preventive measure.

ADDITIONAL RESOURCES

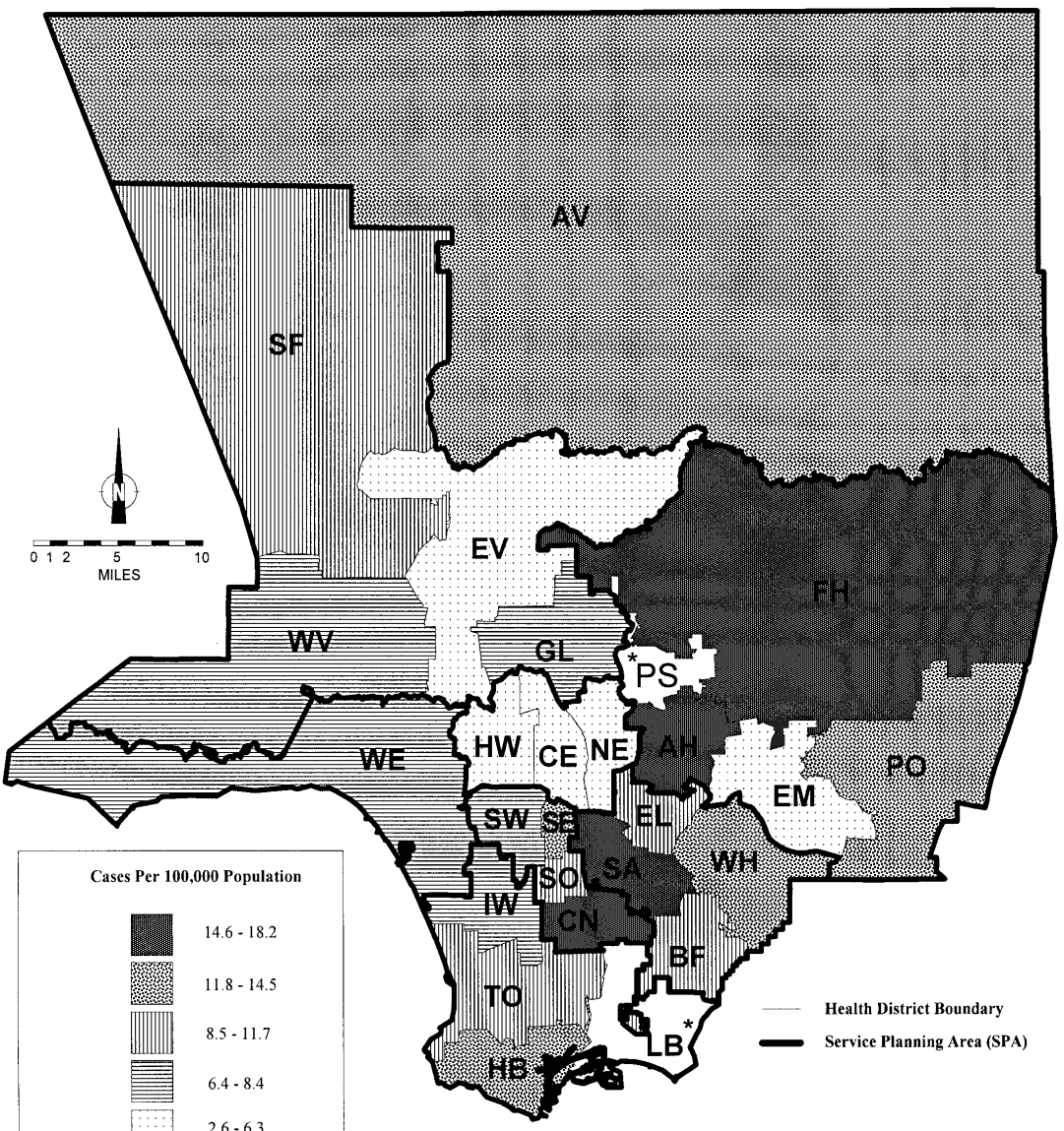
CDC. Respiratory and Enteric Viruses Branch, Viral (Aseptic) Meningitis at:
www.cdc.gov/ncidod/dvrd/virlmen.htm

CDC. Respiratory and Enteric Viruses Branch, Non-polio Enterovirus Infections at:
www.cdc.gov/ncidod/dvrd/entrvirs.htm

Association of State and Territorial Directors of Health Promotion and Public Health Education, Infectious Facts, Viral Meningitis at: www.astdhpphe.org/infect/vmenin.html

CDC. Outbreaks of Aseptic Meningitis Associated with Echoviruses 9 and 30 and Preliminary Reports on Enterovirus Activity—United States, 2003. MMWR 2003; 32: 761-763. Available at:
www.cdc.gov/mmwr/preview/mmwrhtml/mm5232a1.htm

MAP 8. Meningitis, Viral
Rates by Health District, Los Angeles County, 2003*



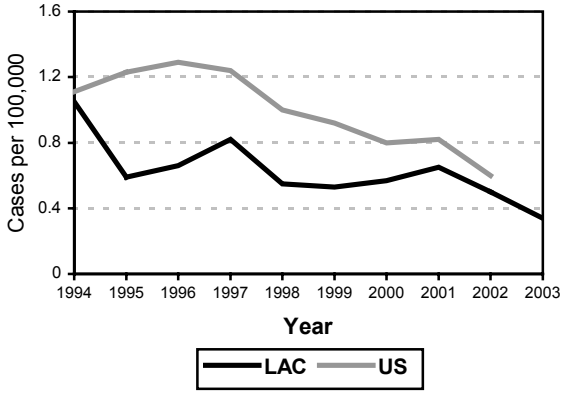
*Excludes Long Beach and Pasadena Data.

MENINGOCOCCAL DISEASE

CRUDE DATA	
Number of Cases	32
Annual Incidence[a]	
LA County	0.34
California	0.69
United States	0.61
Age at Diagnosis	
Mean	24
Median	19
Range	<1–90 years
Case Fatality	
LA County	16%
United States	N/A

[a] Cases per 100,000 population.

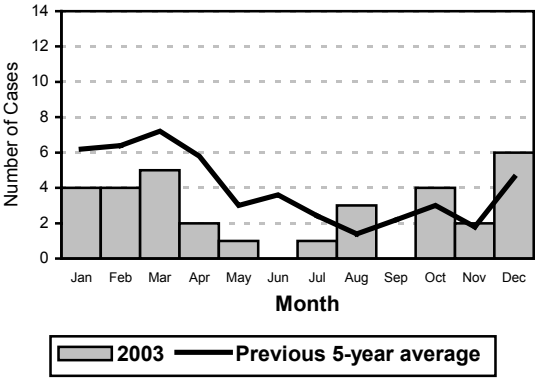
Figure 1
Meningococcal Disease
Incidence Rates by Year of Onset
LAC and US, 1994–2003



DESCRIPTION

Meningococcal disease occurs most often as meningitis or bloodstream infection (meningococcemia) and is transmitted through direct or droplet contact with nose or throat secretions of persons infected with the *Neisseria meningitidis* bacterium. Common symptoms include sudden onset of fever, headache, nausea, vomiting, stiff neck and lethargy which can progress to overwhelming sepsis, shock and death within hours. Long-term sequelae include significant neurologic or orthopedic complications such as deafness or amputation secondary to disseminated intravascular coagulation and thromboses. Meningococcal disease affects all age groups but occurs most often in infants. Of the 12 serogroups, only A, C, Y, and W-135 are vaccine-preventable.

Figure 2
Meningococcal Disease
by Month of Onset
LAC, 2003 (N=32)



DISEASE ABSTRACT

Meningococcal disease cases remained low and decreased by 30% (n=14); however, there were more deaths (n=5) than in the previous year. Groups B, C, and Y were the serogroups identified from case isolates.

STRATIFIED DATA

Trends: Cases were sporadic and continued to decline (Figure 1). Serogroup B isolates increased among those submitted for serogroup identification and outnumbered serogroups C or Y by more than 3:1 (Figure 5).

Seasonality: Cases were characteristically highest during winter and early spring (Figure 2).

Age: Although there was a decrease in the number and rate of cases in infants aged <1 year, rates were characteristically highest in both this group and children aged 1–4(1.5 per 100,000 in each). Combined, these age groups accounted for 38% (n=10) of all cases. Over half of all cases occurred in those of college age or younger (<23 years). With the exception of infants <1 year, the rate among all other age groups remained relatively stable in comparison to the five-year average (Figure 3).

Sex: The male-to-female rate ratio was 1.3:1.

Race/Ethnicity: Sixty percent of cases occurred among Hispanics compared to 31% among Whites. Only 9% of cases occurred among Asians and Blacks. Although rates were the same for Hispanics and Whites (0.4 per 100,000), and at least twice that of Asians and blacks (Figure 4), the actual number of cases in each of these groups is too low for the rates to be reliable**.**

Location: The number of cases was highest in SPA 2 (n=8), 3 (n=6), and 5 (n=4) respectively.

Figure 3
Meningococcal Disease
Incidence Rates by Age Group
LAC, 2003

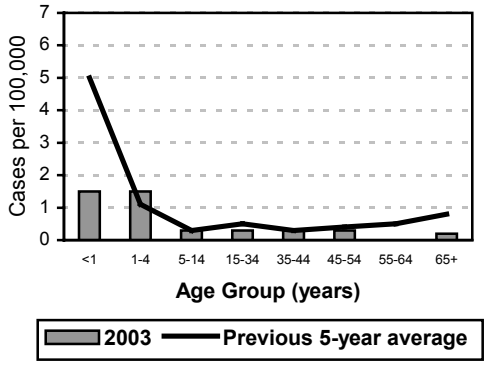
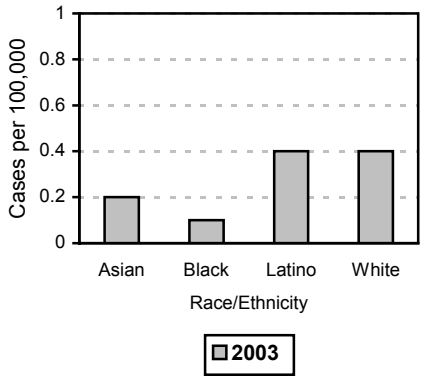


Figure 4
Meningococcal Disease
Incidence Rates by Race/Ethnicity
LAC, 2003



PREVENTION

Meningococcal vaccine (Menomune), which protects against serogroups A, C, Y, and W-135, is routinely given to military recruits and is recommended for those with terminal complement deficiencies or asplenia, travelers to endemic or epidemic areas, and certain lab personnel. Since 2000, the Advisory Committee on Immunization Practices (ACIP) has recommended that college students, especially freshmen and those living in dormitories, be informed about meningococcal disease and the benefits of the vaccine. In 2001, California passed legislation requiring development of a Meningococcal Disease Strategic Prevention Plan which recommends that the ACIP plan be followed and that efforts be increased to educate parents, teens and medical providers about risk reduction, vaccine use and availability. Other states have passed legislation requiring documentation that students entering college have received information about meningococcal disease and have either received or declined immunization.

In 2003, of the cases in which serogroup identification was made, 65% (compared to 15% in 2002) were serogroup B and thus were not vaccine preventable.

COMMENTS

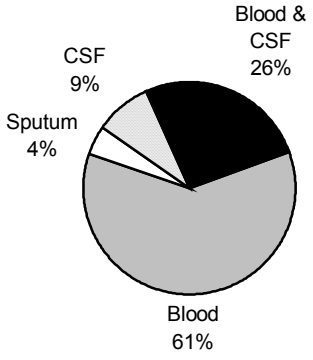
In 2003*, N. meningitidis* was confirmed by culture in 23 (72%) of 32 cases: 14 (61%) from blood, 2 (9%) from cerebrospinal fluid (CSF), 6 (26%) from both blood and CSF, and 1 (4%) from sputum (Figure 5).

The Public Health Laboratory received 17 case isolates (53% of all cases) for serogroup identification. Of these, 65% were serogroup B; 17.5% were serogroup C; 17.5% were serogroup Y (Figure 6). Unlike 2002, no serogroup W-135 or nontypeable strains were identified.

Although most cases in 2003 were sporadic and unassociated, two cases of bacterial meningitis with rapid onset, deterioration, and the death of one, occurred within a day of each other in adolescents who had attended the same social gathering two days earlier. No organism was recovered however the cases were managed as suspected co-infected primary cases of meningococcal disease.

Two cases occurred in community college students. However there were none in students attending four-year institutions.

Figure 5
Meningococcal Disease
by Culture Site
LAC, 2003



ADDITIONAL RESOURCES

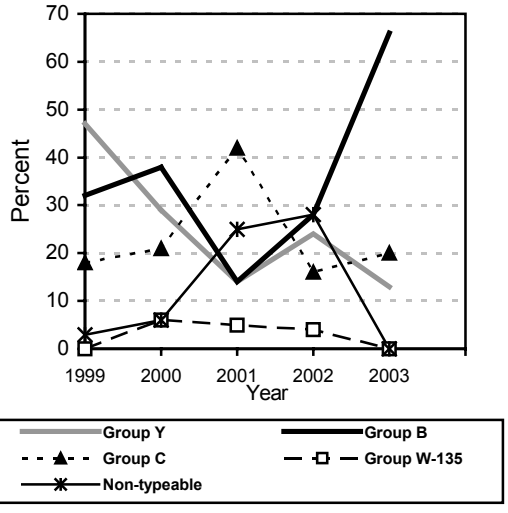
Meningococcal Disease Prevention Plan, Division of Communicable Disease, California Department of Health Services. Available at: www.dhs.ca.gov/ps/dcdc/disb/pdf/Meningococcal%20Plan%20Final%202003.pdf

Control and Prevention of Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2000; 46(RR–07):1–10. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr4907a1.htm

Prevention and control of meningococcal disease among college students: recommendations of the Advisory Committee on Immunization Practices (ACIP).
MMWR 2000; 49 (RR–7):1–20. Available at: www.cdc.gov/mmwr/PDF/rr/rr4907.pdf

Opportunities for control of meningococcal disease in the United States. Raghunathan PL, Bernhardt SA, Rosenstein NE. Annu Rev Med. 2004; 55:333-53.

Figure 6
Meningococcal Disease
by Serogroup
LAC, 1999–2003

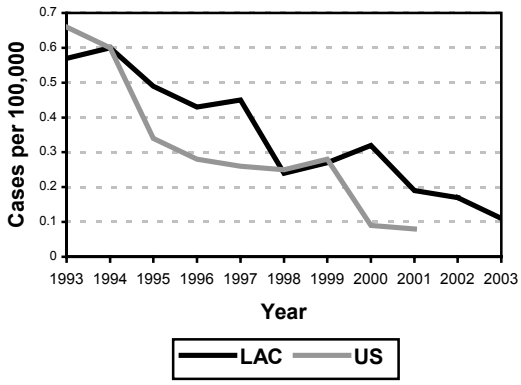


MUMPS

CRUDE DATA	
Number of Cases	10
Annual Incidence[a]	
LA County	--[b]
California	
United States	
Age at Diagnosis	
Mean	9
Median	7
Range	4–31 years
Case Fatality	
LA County	0
United States	N/A

[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.

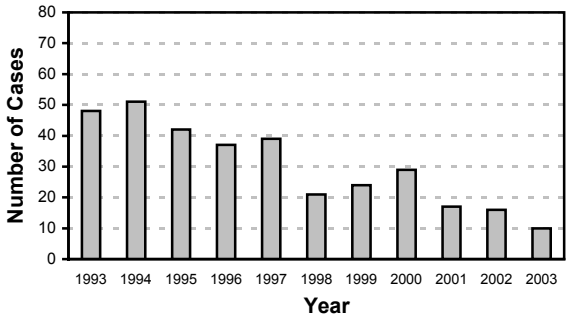
Figure 1
Mumps
Incidence Rates by Year of Onset
LAC and US, 1993–2003



DESCRIPTION

Mumps is a vaccine-preventable disease caused by an RNA paramyxovirus that is transmitted by direct contact with respiratory droplets from infected persons. Symptoms begin 14–18 days after exposure, with a range of 12–25 days, and include swelling of salivary glands, fever, and inflammation of the testes in teenage and adult males. Up to 20% of infected individuals may be asymptomatic. Sequelae include encephalitis, meningitis, orchitis, arthritis, and deafness. In addition, pregnant women who contract mumps are at increased risk of spontaneous abortions. Most reported cases are diagnosed based on clinical symptoms and do not have supporting laboratory confirmation (i.e., mumps IgM antibody assay). Although single probable or confirmed cases are reportable, only outbreaks of two or more cases are investigated.

Figure 2
Mumps
Cases by Year of Onset
LAC, 1993–2003



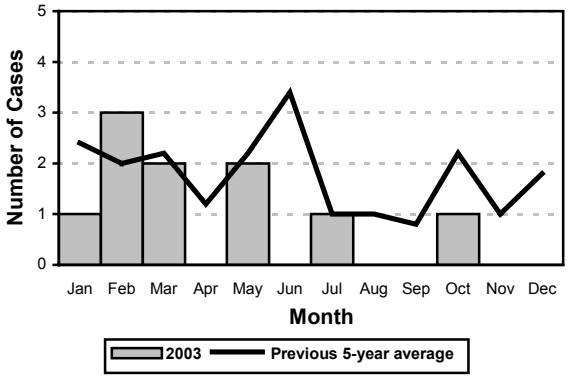
DISEASE ABSTRACT

- The incidence of mumps cases in LAC has been steadily declining since 1992 (Figure 1).
- Of 37 mumps reports received at the LAC Immunization Program during 2003, there were only 10 confirmed mumps cases identified in LAC.
- During 2003, there were 10 reported cases in the US, of which, 59 cases were reported in California.

IMMUNIZATION RECOMMENDATIONS

- Two doses of mumps-containing vaccine, usually given as Measles-Mumps-Rubella (MMR), are normally recommended to achieve immunity. The first dose is recommended at 12 months of age. The second dose can be given as early as four weeks after the first dose, but is usually given at ages 4 to 6 years. Vaccination is recommended for those who have no prior MMR, particularly if they are in a high-risk setting.
- Over 95% of those who receive the current live attenuated mumps vaccine develop immunity.
- Women should not become pregnant within 4 weeks of vaccination.
- Individuals who are severely immunocompromised for any reason should not be given MMR vaccine.

Figure 3
Mumps
Cases by Month of Onset
LAC, 2003



STRATIFIED DATA

Trends: Since 1993, the annual number of cases of mumps has decreased by 79%. This decline reflects the effectiveness of the MMR vaccine in reducing the incidence of disease in the general population, however, the continued identification of cases indicates more work that needs to be done to vaccinate remaining individuals and prevent further transmission.

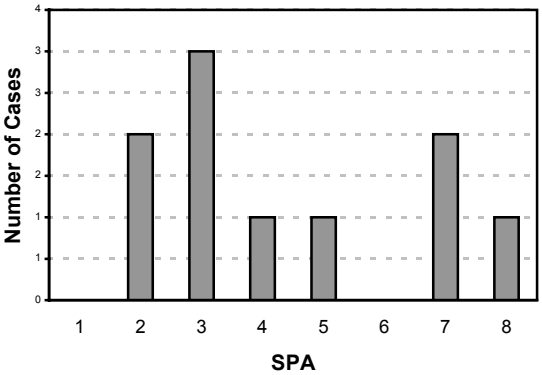
Seasonality: Historically, case reports have peaked during the winter and spring seasons. However, most of the cases (60%) occurred in the first three months of 2003, and the remaining cases were uniformly distributed throughout the year (Figure 3).

Age: Persons under the age of 11 accounted for 90% (n=9) of all reported cases in 2003.

Sex: The male-to-female ratio of the cases was 1:0.7

Race/Ethnicity: About half of the reported mumps cases occurred among non-Latinos. There were 4 Hispanic cases, 2 cases among Whites, 1 case reported as Asian, 1 case identified as Other race/ethnicity, and 2 as unspecified race/ethnicity.

Figure 4
Mumps
Cases by Service Planning Area
LAC, 2003



Location: Cases were reported in six of the eight SPAs (Figure 4). Three of the cases resided in San Gabriel (SPA 3). San Fernando Valley (SPA 2) and East (SPA 7) reported two cases each, and Metro (SPA 4), West (SPA 5), and South Bay (SPA 8) each accounted for one case.

COMMENTS

The majority of reported individual (non-outbreak related) and non-lab confirmed clinical mumps cases among highly immunized populations are most likely caused by other agents such as coxsackie and parainfluenza group 3 viruses. Recurrent parotitis can also result from non-infectious etiologies.

Cluster Identification: None of the cases in 2003 was epidemiologically linked to another.

Vaccination Status: Most of the cases (n=6, 60%) had documented dates for their MMR vaccinations. Two cases claimed to have been adequately vaccinated, but no documentation was available. Two cases had an unknown vaccination status.

ADDITIONAL RESOURCES

Additional information is available at:

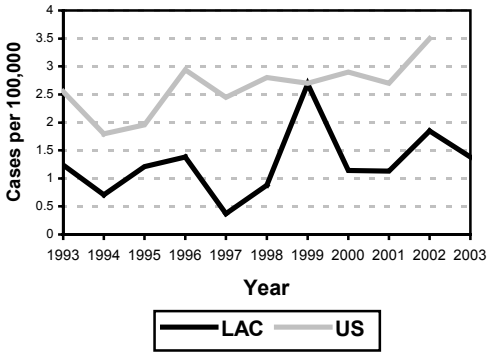
- National Immunization Program – www.cdc.gov/ip
- Immunization Action Coalition – www.immunize.org
- LAC DHS, Immunization Program – www.lapublichealth.org/ip

PERTUSSIS (WHOOPING COUGH)

CRUDE DATA	
Number of Cases	130
Annual Incidence[a]	
LA County	1.38
California	3.59
United States	4.04
Age at Diagnosis	
Mean	7.3 years
Median	4 months
Range	1 day–83 years
Case Fatality	
LA County	1.5%
United States	N/A

[a] Cases per 100,000 population.

Figure 1
Pertussis
Incidence Rates by Year of Onset
LAC and US, 1993–2003

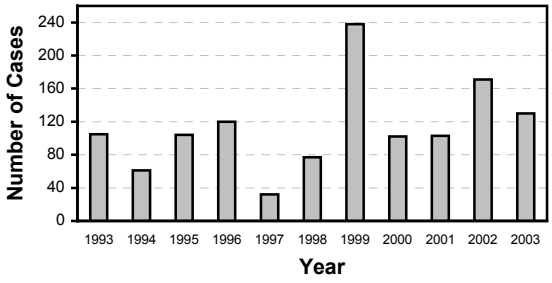


DESCRIPTION

Pertussis, commonly known as whooping cough, is a vaccine-preventable disease spread by close contact with the respiratory secretions of infected individuals. Typical symptoms include paroxysmal coughing, inspiratory whooping, and post-tussive vomiting. Complications include pneumonia, seizures, and encephalopathy. Infants under 1 year of age are at highest risk for developing severe complications, but are the least likely to transmit the disease to susceptible individuals if infected.

The minimum clinical criteria for pertussis is a cough lasting at least two weeks with paroxysms of coughing, inspiratory "whoop," or post-tussive vomiting, without other apparent causes. Pertussis is confirmed by either positive *B. pertussis* culture or PCR.

Figure 2
Pertussis
Cases by Year of Onset
LAC, 1993–2003



DISEASE ABSTRACT

- The majority of reported cases in 2003 were among children less than one year of age, followed by the 5-14 year age group.
- Preceding their illness, nearly half of the cases in 2003 had contact to a person who had a prolonged cough.
- Of the 2003 cases that could have been fully immunized and protected against pertussis, only half were adequately immunized.

IMMUNIZATION RECOMMENDATIONS

- A pertussis-containing vaccine should be administered at 2 months, 4 months, 6 months, 15–18 months, and 4–6 years of age to provide protection against the disease.
- Immunity conferred by the pertussis component of the DTP/DTaP vaccine decreases over time, with some vaccinated individuals becoming susceptible to pertussis 5–10 years following their last dose.
- Currently, there is no pertussis vaccine booster available for adults.

STRATIFIED DATA

Seasonality: Typically, the summer months have the highest pertussis incidence in LAC (Figure 3). However, this was not exactly the case in 2003, as evidenced by the disease onset occurrence of 42.3% of the cases during the winter months of October, November, December, and January. The 5-14 year age group accounted for 21.4% of the cases with disease onset during the month of December alone.

Age: As evidenced in previous years, approximately 63.1% (n=82) of reported cases in 2003 were among children less than one year of age. This is consistent with the national trends. However, cases are increasing among older children and adolescents over the past few years, as evidenced by the 5-14 age group accounting for 13.9% of the total identified cases.

Sex: The male-to-female rate ratio was approximately 1:0.9

Race/Ethnicity: After adjusting for age, rates in 2003 among Blacks and American Indians were higher than the previous 5-year averages (Figure 5). Rates among Latinos and Whites are approximately the same, although the population proportion of Whites (30.3%) is much lower than that for Latinos (46.8%).

Location: The number of cases per SPA ranged from 0 to 34. Of those cases where address was indicated, San Fernando SPA 2, South SPA 6, and South Bay SPA 8 reported the most cases. However, SPA 6 had the highest rate (3.37 cases per 100,000 respectively) and Antelope Valley SPA 1 had the lowest rate of 0 cases per 100,000. The clustering of cases in specific geographic areas is influenced in part by the active reporting efforts of local hospitals.

Figure 3
Pertussis
Cases by Month of Onset
LAC, 2003

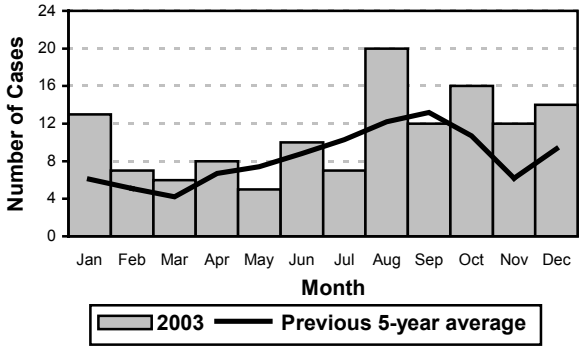


Figure 4
Pertussis
Cases by Age Group
LAC, 2003

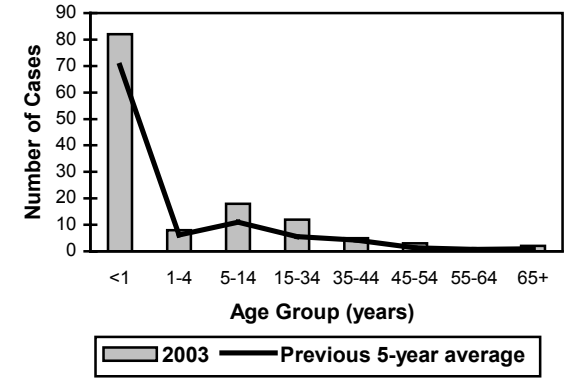
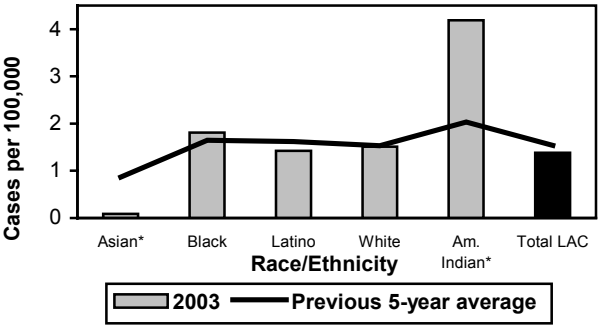


Figure 5
Pertussis
Age-Adjusted Incident Rates by
Race/Ethnicity
LAC, 2003



*Rates unreliable due to small number of observations.

COMMENTS

Because immunity induced by pertussis vaccine decreases over time, adolescents and adults can develop infection and serve as a source of transmission to infants who are not adequately immunized. Adults and adolescents with pertussis are more likely to have mild or atypical disease, so they often go undiagnosed. Future licensure and widespread use of an acellular pertussis booster vaccine for adolescents and adults should significantly decrease the incidence of pertussis in children, as well as its complications.

More effort is underway to educate providers on the impact adults and adolescents have on the continued increase in transmission of pertussis, urging them to be more diligent in observing, confirming, and reporting suspect pertussis cases in this population.

Trends: Pertussis incidence in LAC has peaked every 3–4 years since 1991 with the highest incidence in 30 years occurring in 1999 (N=238). After a 2002 rate was 48% higher than the previous 5-year average, the 2003 case rate was 25% lower.

Laboratory Confirmation: Over half of reported cases (57.7%, n=75) were not laboratory confirmed.

Vaccination Status: Nearly one third of cases (26.9%, n=35) were younger than two months of age and were too young to receive pertussis vaccine. About 16.9% (n=22) of cases were 15 years of age or older; so even if they were fully immunized in early childhood, they would not have had complete immunity against pertussis in 2002. Thus, 43.8% percent of the cases reported in 2003 were susceptible to pertussis.

Thirty-two percent (n=41) of cases were between 2–6 months of age. Of these, 29.3% were up to date with pertussis vaccination for their age, but would not have developed full immunity against pertussis. Of the children who could have had full immunity from vaccination (7 months to 15 years old), 18 (56.3%) were fully up to date. The previous 5-year trend has indicated that, on average, only 58.2% of cases 7 months to 15 years of age were adequately immunized.

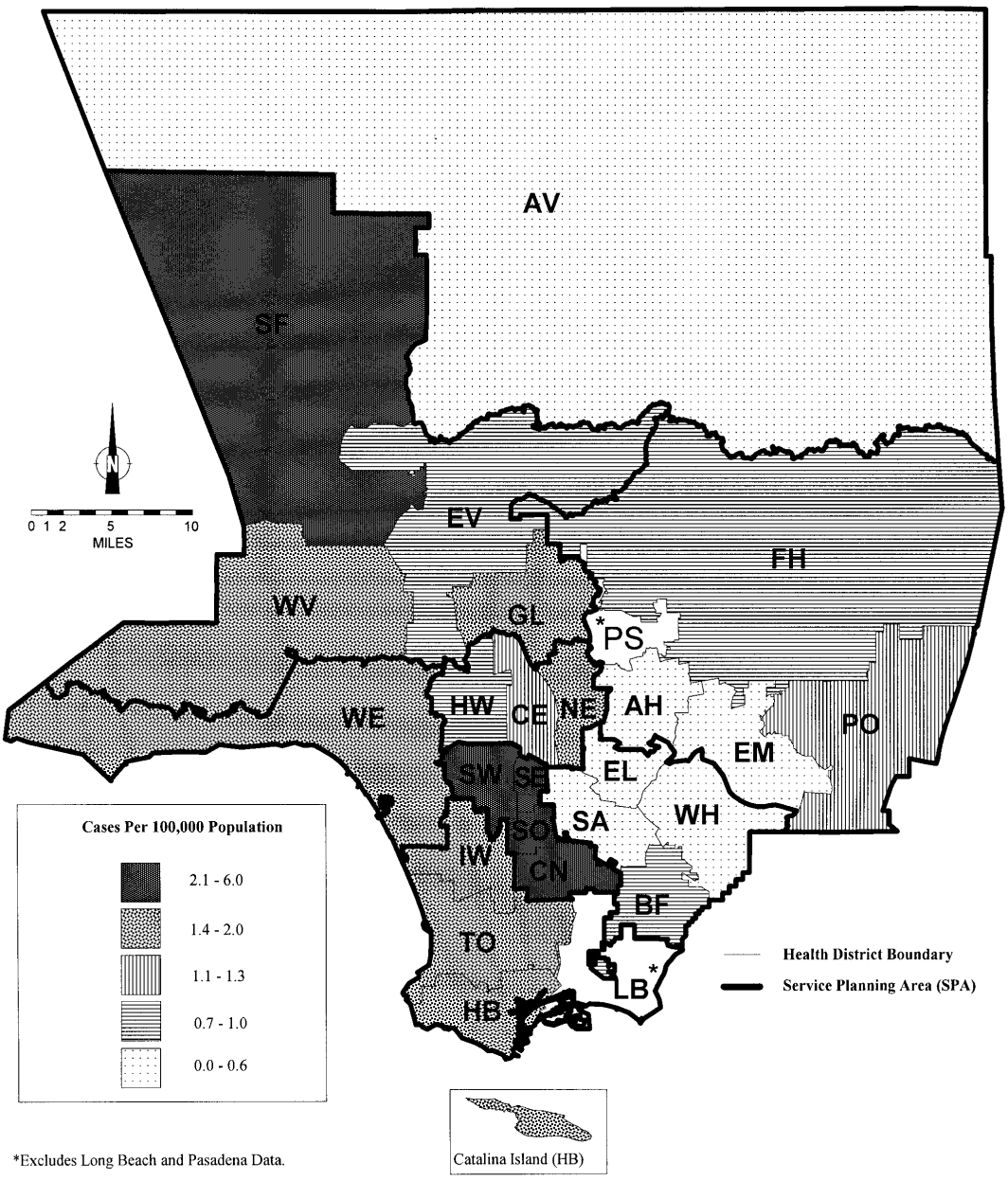
Complications/Hospitalization: Half of the cases (50.8%, n=66) were hospitalized, with an average hospital stay of 9 days (range 2–31 days). Sixty-three of the hospitalized cases were less than one year of age. Of the 9 cases who developed pneumonia, all were infants less than 1 year of age. The one case with seizures was in an infant less than 1 year of age. Two infants aged less than one year died from complications.

ADDITIONAL RESOURCES

Additional information is available at:

- National Immunization Program – www.cdc.gov/nip
- Immunization Action Coalition – www.immunize.org
- LAC DHS, Immunization Program – www.lapublichealth.org/ip

MAP 9. Pertussis
Rates by Health District, Los Angeles County, 2003*

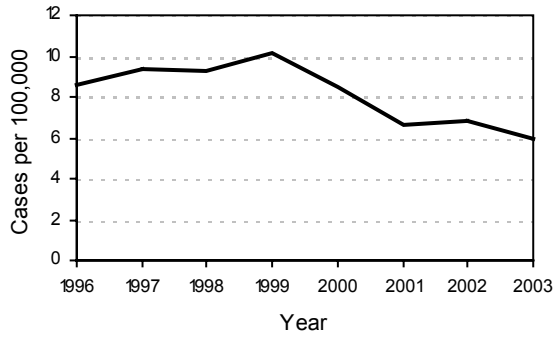


*Excludes Long Beach and Pasadena Data.

PNEUMOCOCCAL DISEASE, INVASIVE

CRUDE DATA	
Number of Cases	559
Annual Incidence[a]	
LA County	5.95
United States[b]	14.20
Age at Diagnosis	
Mean	53
Median	56
Range	<1–100 years
Case Fatality	
LA County[c]	20.0%
United States	N/A

Figure 1
Invasive Pneumococcal Disease
Incidence Rates by Year of Culture
LAC, 1996–2003



[a] Cases per 100,000 population.
[b] Estimation from provisional data from the Active Bacterial Core Surveillance Emerging Infections Program Network [3].
[c] Validity questionable since outcome status of 47% of 2003 cases were reported as "unknown".

DESCRIPTION

Streptococcus pneumoniae is a leading cause of illness in young children and causes considerable illness and death in the elderly. This bacterium (pneumococcus) can attack different parts of the body causing pneumonia, bacteremia, and meningitis. Common symptoms are chills, fever, pleural pain, and a productive cough and transmission is via droplet spread, direct oral contact, or indirectly through articles freshly soiled with respiratory discharges [1]. The elderly, children under 2 years old, blacks, American Indians and Alaska Natives, children who attend group day care centers, and persons with underlying medical conditions including HIV infection and sickle-cell disease are at a higher risk of infection with *S. pneumoniae* [2].

LAC DHS has been following IPD as a special surveillance project since late 1995 but recently in October 2002 added IPD to its list of reportable diseases to enhance surveillance of this infection. The purpose of the surveillance is to measure the incidence of IPD in LAC, identify antibiotic resistance patterns, and monitor the effect of pneumococcal vaccines. Recently the importance of surveillance has been illustrated by the observation of the changing IPD epidemiology in LAC since the introduction of the pneumococcal conjugate vaccine for children less than 2 years old.

IPD cases are defined as LAC residents with a positive isolate for *S. pneumoniae* collected from a normally sterile site. Antimicrobial susceptibility is determined by disk diffusion or dilution diffusion. Minimum inhibitory concentration (MIC) breakpoints utilized by participating laboratories are based on the National Committee for Clinical Laboratory Standards. For this report, an isolate of *S. pneumoniae* is considered nonsusceptible to an antimicrobial agent if the results indicate intermediate or high-level resistance.

DISEASE ABSTRACT

- The 2003 incidence rate for IPD continued to follow a downward trend from its peak in 1999.
- The elderly are at highest risk for acquiring IPD.
- The rate in children under 5 years was the lowest since 2000.

- Resistance to penicillin was not associated with increased mortality.

STRATIFIED ANALYSIS

Trends: The IPD incidence rate for 2003 was 5.95 cases per 100,000 (n=559, Figure 1). A 41% decrease was observed in 2003 compared to the peak incidence observed in 1999.

Seasonality: The IPD cases from 2003 followed the typical seasonal pattern, peaking in the winter then gradually declining through spring. The pattern for most of the year was lower than the previous five-year average for most of the year (Figure 2).

Sex: Male-to-female ratios indicated more males acquired IPD.

Age: The mean age for IPD cases was 53 years, median 56 years, ranging from 24 days to 100 years. For 2003, the highest age-specific incidence rates occurred among adults 65 years and over, which is common with IPD. Children less than 5 years of age continue to have a lower rate than previous years (Figure 3).

Disease Severity: In 2003, the case fatality rate was 20%, higher than previous years (range 13 to 16% from 2000 to 2002). The number of deaths did not differ greatly from last year (51 in 2002 and 58 in 2003) but the total number of cases has declined. Knowing only age and outcome status, 31 cases that died were in a vaccine-preventable age group (2 children under 2 years and 29 adults ≥65 years).

Reported culture site for 2003 did not vary greatly from previous years. Other sites reported included brain tissue, joint/synovial fluid, peritoneal fluid, pleural fluid, thoracentesis fluid, lower lung lobe abscess, lung tissue, and vitreous fluid (Figure 4).

Antibiotic Susceptibility: From 2000 to 2003, the proportion of penicillin nonsusceptible *S. pneumoniae* (PNSP) isolates has decreased to a 4-year low (18%) in 2003 (Figure 5). Ninety-three percent of the cases had antimicrobial resistance information provided for at least one antibiotic. The percent of cases nonsusceptible to erythromycin, cefotaxime, and trimethoprim-sulfamethoxazole (TMP-SMZ) has also decreased from 2002 to 2003. Of the 252 cases reported in 2003 with testing results on levofloxacin, only two cases (0.8%) were nonsusceptible which is comparable to 0.5% seen in 2002 from a nationwide population-based surveillance system for IPD [4].

Figure 2
IPD Cases By Month of Culture
LAC, 2003

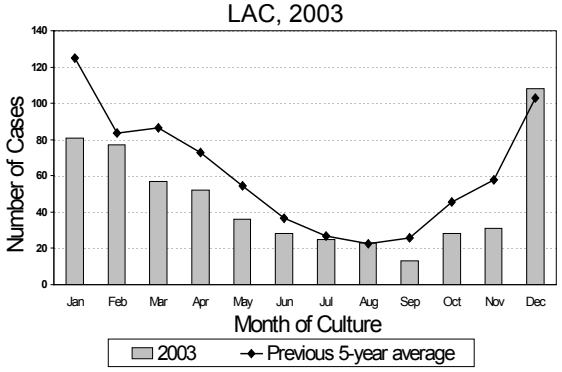


Figure 3
Incidence Rates of IPD Cases by Age, LAC, 2000–2003

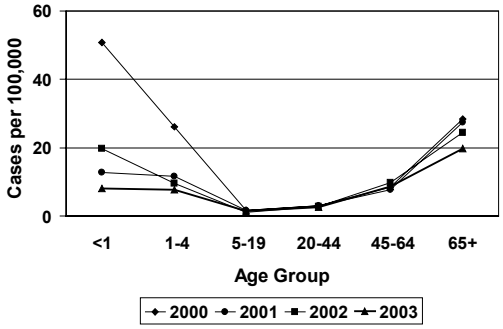
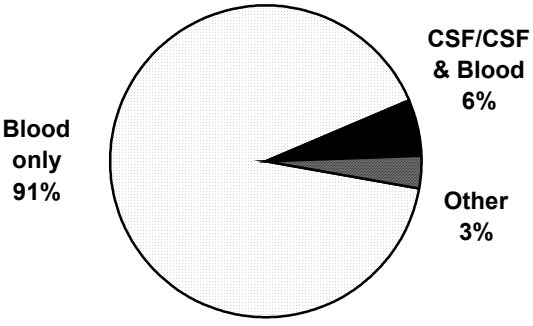


Figure 4
IPD
by Culture Site
LAC, 2003 (N=559)

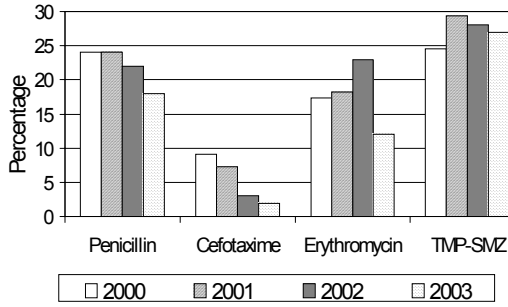


This proportion of PNSP cases changed from 2002 to 2003 for most of the age groups. The only increase of 11% (n=28) was observed among those 5 to 19 years of age and the largest decrease of 52% (n=8) was in children less than 1 year (Figure 6), although the results are unstable due to small numbers. Thirteen percent of the deaths were associated with PNSP (5/39).

PREVENTION

Two effective vaccines are available for pneumococcal disease. Heptavalent pneumococcal conjugate vaccine (Prevnar®) is recommended by the Advisory Committee on Immunization Practices (ACIP) for all children less than age 2 years, and for children up to age 5 years who are at high risk of invasive pneumococcal infections [3]. The 23-valent pneumococcal polysaccharide vaccines (Pnu-Imune®23 and Pneumovax®23) are recommended for all adults ≥ 65 years and those over age 2 years who are at high risk of invasive pneumococcal disease [4]. For children aged 2 years to 5 years who are at high risk of invasive pneumococcal infections, ACIP recommends use of pneumococcal conjugate vaccine followed at least 2 months later by the 23-valent pneumococcal polysaccharide vaccine. This regimen provides protection against a broader range of serotypes, although supporting data are limited [4].

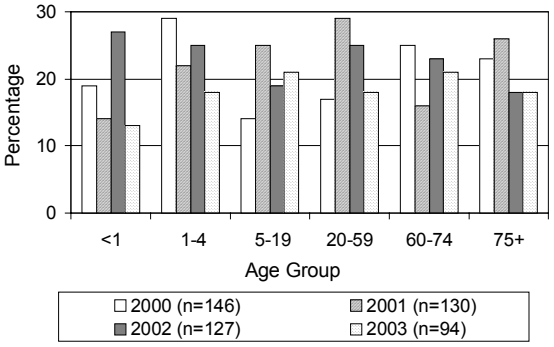
Figure 5
IPD Cases Nonsusceptible to Selected Antimicrobial Agents
LAC, 2000– 2003



COMMENTS

There were limitations to the data collected. For about half of the 2003 cases, outcome status was unknown, although it should be noted that the percent with unknown outcomes stayed constant for the past three years. Also, the case fatality rate may be underestimated since reporting of positive isolates is required within seven days and many times the final outcome of current infection has not been determined yet.

Figure 6
PNSP Cases by Age
LAC, 2000– 2003



Current statistics underscore the importance of vaccination in preventing pneumococcal disease as demonstrated by the marked decrease of IPD cases in children from 2001 to 2003 after the introduction of pneumococcal conjugate vaccine (Prevnar®). The medical community should continue vaccinating children with Prevnar® but also focus their resources on promoting better vaccination rates in the elderly. The 23-valent pneumococcal polysaccharide vaccines (Pnu- Imune®23 and Pneumovax®23) are especially important based on 2003 data indicating that the elderly continue to be at high risk of acquiring IPD and account for half of all IPD deaths.

REFERENCES

1. Chin, J. Control of Communicable Diseases Manual. 17th Edition. 2000.
2. Technical reports for *Streptococcus pneumoniae* disease. Information available at:
3. From: www.cdc.gov/ncidod/dbmd/diseaseinfo/streppneum_t.htm. Accessed 8/9/2004.
4. CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1997; 46:1–24.
5. CDC. Preventing pneumococcal disease among infants and young children: recommendations of the

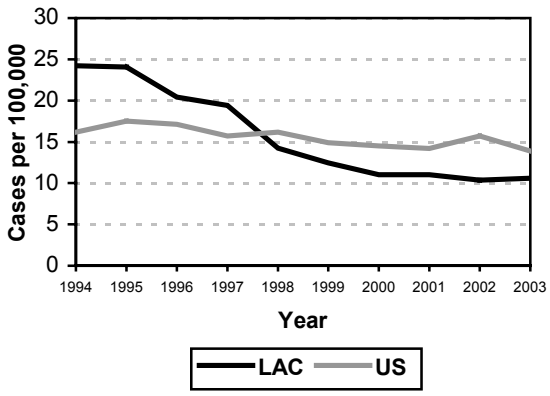
Advisory Committee on Immunization Practices (ACIP). MMWR 2000; 49:1–35.
6. Active Bacterial Core Surveillance Reports from 1997 to 2002 from the Centers for Disease Control and Prevention's Division of Bacterial and Mycotic Diseases. Report available at: www.cdc.gov/ncidod/dbmd/abcs/survreports.htm. Accessed 6/17/2004.

SALMONELLOSIS

CRUDE DATA	
Number of Cases	995
Annual Incidence[a]	
LA County	10.60
California	11.79
United States	15.16
Age at Diagnosis	
Mean	26
Median	23
Range	<1–102 years
Case Fatality	
LA County	0.7%
United States	N/A

[a] Cases per 100,000 population.

Figure 1
Salmonellosis
Incidence Rates by Year
LAC and US, 1994–2003



DESCRIPTION

Salmonellosis is caused by a gram negative bacillus, *Salmonella* enterica, of which there are more than 2,500 serotypes. This disease is transmitted by the fecal-oral route, from animal or human, with or without intermediary contamination of foodstuffs. The most common symptoms include diarrhea, fever, headache, abdominal pain, nausea and sometimes vomiting. Occasionally, the clinical course is that of enteric fever or septicemia. Asymptomatic infections may occur. The incubation period is usually 12–36 hours for gastroenteritis, longer and variable for other manifestations. Communicability lasts as long as organisms are excreted, usually from 2–5 weeks, but may last for months to years. Healthy people are susceptible, but persons especially at risk are those who are on antacid therapy, have recently taken or are taking broad-spectrum antibiotic therapy or immunosuppressive therapy, or those who have had gastrointestinal surgery, neoplastic disease, or other debilitating conditions. Severity of the disease is related to the serotype, the number of organisms ingested, and host factors. Immunocompromised persons, such as those with cancer or HIV infection, are at risk for recurrent *Salmonella* septicemia. Occasionally the organism may localize anywhere in the body, causing abscesses, osteomyelitis, arthritis, meningitis, endocarditis, pericarditis, pneumonia, or pyelonephritis.

DISEASE ABSTRACT

- The LAC 2003 salmonellosis crude rate increased 2.8% compared to 2002 (Figure1). It continues to remain below the national rate and has done so since 1998.
- *Salmonella* serotype Typhimurium was the most common isolate in 2003 and although the raw numbers increased there was a negative 1.1% percent change due to the increase in the total number of isolates (Table 1).
- *S.* Enteritidis was the second most common serotype in 2003 accounting for 15.5% of all isolates and decreased 17.6% from 2002. It had been the most common for the previous nine years, since 1994.
- There were seven salmonellosis outbreaks during 2003, two each of serotypes Newport and Schwarzengrund, and one each of Saint Paul, Virchow, and Oranienburg.

- SPA 7 had the highest incidence (13.5 per 100,000) of salmonellosis during 2003 and none of the 182 cases in SPA 7 were due to an outbreak.

STRATIFIED DATA

Trends: The incidence of reported salmonellosis cases for LAC in 2003 was 10.6 cases per 100,000 population. This is higher than the 2002 incidence of 10.3 cases per 100,000 population but is less than the national incidence of 15.8 per 100,000 population. In 2003, ACDC continued to include "presumptive cases," those that meet a clinical case definition and have an epidemiological link to a laboratory confirmed case. If the presumptive cases are removed, the rate decreases to 10.1 per 100,000.

Salmonella Serotypes: This year *S.* Typhimurium was the number one serotype, making up 18.4% of total isolates serotyped. There was a 17.6% decrease in *S.* Enteritidis cases in 2003, the first time in nine years that it wasn't the most frequent serotype. *S.* Enteritidis made up 15.4% of all the *Salmonella* isolates for 2003 (Table 1). Saint Paul increased 230.8% due in part to an outbreak and *S.* Oranienburg's increase was also due to an outbreak in 2003 (Table 2). *S.* Newport remained the third highest ranking isolate due to two outbreaks during 2003. The reason for the increase of *S.* Montevideo, Muenchen and Panama isolates is unknown.

Table 1. Most Frequent *Salmonella* Serotypes—LAC, 2002–2003

	2002 (N=900)*		2003 (N=947)		
Serotype	**No.**	**Percent**	**No.**	**Percent**	**%Change**
Typhimurium**	167	18.6	174	18.4	+1.1
Enteritidis	169	18.8	147	15.4	-17.6
Newport	83	9.2	80	8.5	-8.7
Montevideo	37	4.1	70	7.4	+80.1
Heidelberg	50	5.6	47	5.0	-10.7
Saint Paul	12	1.3	41	4.3	+230.8
Muenchen	12	1.3	31	3.3	+153.9
Agona	27	3.0	29	3.1	+3.3
Oranienburg	19	2.1	25	2.6	+23.8
Panama	5	0.6	25	2.6	+333.3

* Includes only serotyped isolates.
** Includes *S.* Typhimurium var. Copenhagen and degraded form.

Seasonality: In 2003, the peak in incidence occurred during August and September, similar to the previous 5-year average, due in part to outbreaks. A drop in cases is seen in the last quarter, consistent with past years, is also shown for 2003 (Figure 2).

Age: As shown in Figure 3, the highest age group rates of infection occurred among infants aged less than 1 year (58.5 per 100,000 population) followed by children aged 1–4 years (32.1 per 100,000 population). This is typical for salmonellosis.

Hospitalized: In 2003, 23.9% of cases were hospitalized for more than 24 hours, 3.5% fewer cases than in 2002 (26.4 %).

Sex: The male-to-female rate ratio was 1:1.1

Figure 2
Salmonellosis
Cases by Month of Onset
LAC, 2003

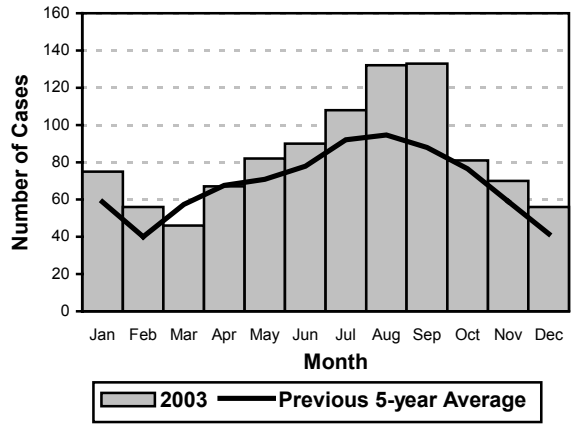
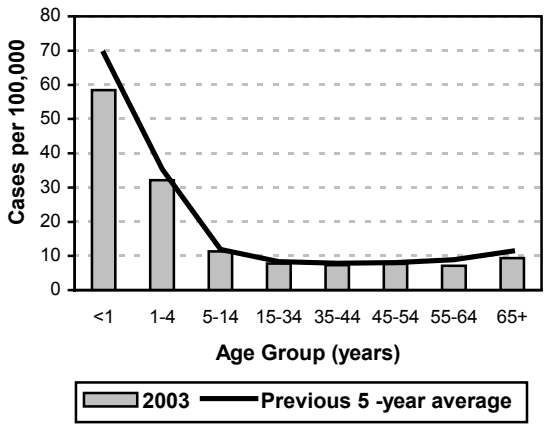


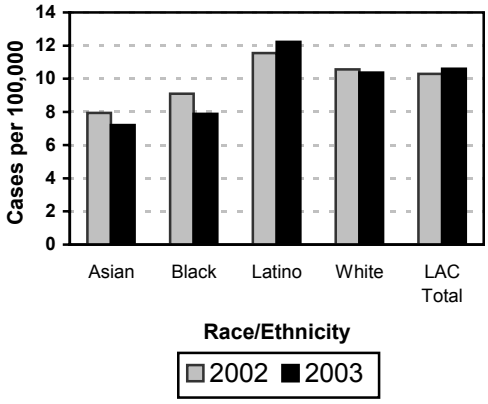
Figure 3
Salmonellosis
Incidence Rates by Age Group
LAC, 2003



Race/Ethnicity: The highest age-adjusted rate was in Latinos (12.2 cases per 100,000), followed by Whites (10.4 per 100,000 population) then Blacks (7.9 per 100,000 population) and Asians (7.2 per 100,000 population). The Latino rate had a slight increase and was higher than the total LAC rate while all others decreased slightly. However, rates are fairly consistent with 2002 (Figure 4).

Location: East L.A. Health District had an increase from 17.2 to 22.0 per 100,000 population and the highest incidence rate, followed by North East (14.3 per 100,000 population) and Harbor Health District (13.2 per 100,000 population). The two other districts that followed closely were Foothill (13.0 per 100,000 population) and Glendale (12.9 per 100,000 population). Of the SPAs, SPA 7 (13.5 per 100,000 population) had the largest incidence rate, while SPA 1 had the lowest rate (5/1 per 100,000, Figure 5).

Figure 4
Salmonellosis
Age-Adjusted Rates by Race/Ethnicity
LAC, 2002–2003



PREVENTION

Each outbreak of salmonellosis is investigated and preventive measures are recommended. Review of investigation reports shows that many persons engage in high-risk food handling behaviors such as consumption of raw or undercooked meats, or produce, not washing hands and/or cutting boards after handling raw poultry or meat, and not maintaining food at proper temperature to prevent bacterial growth. These investigations demonstrate a need for improved public education on proper handling and preparation of produce and animal-derived foods.

Also, health education targeted at specific high-risk groups is necessary; for example, 25.9% of salmonellosis cases were in the infant through four year age group. Education by District Public Health Nurses to reduce salmonellosis is focused toward parents and preschools. Emphasis is on the following:

- Washing hands for parent/teacher and preschoolers.
- Proper prepping of produce foods/formula for this age group.
- Proper handling/cooking of uncooked meat, poultry and fish.
- Keeping environment/utensils clean/sanitary and risk free from cross contamination.
- Avoiding reptile pets in the home.
- Avoiding reptile pets in a preschool or child care center.

Figure 5
Salmonellosis
Incidence Rates by
Service Planning Area
LAC, 2003

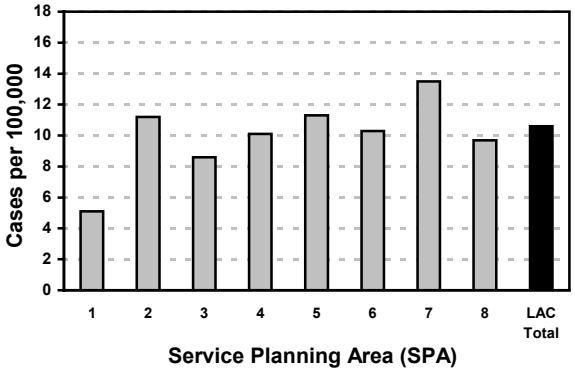


Table 2: Salmonellosis Outbreaks in LAC, 2003

Onset Month	Outbreak Setting	Total # Ill	Culture Positive	Serotype	Suspect Vehicle	Suspect Source
January	Various	2	2	*S.* Newport	Melon	Honeydew or Cantaloupe
March-June	Various	11	10	*S.* Virchow	Unknown	Produce
April-June	Restaurant	11	11	*S.* Oranienburg	Beef Dishes	Beef
May-June	Various	4	4	*S.* SaintPaul	Unknown	Roma Tomatoes, Mangoes
July	Street Vendor/Car	5	4	*S.* Schwartzengrund	Chile Relleno	Unknown
August	Factory Lunch Room/Work Pot Luck	29	8	*S.* Schwartzengrund	Chile Relleno Spaghetti and Meatballs	Unknown
September-October	Restaurant	9	6	*S.* Newport	Unknown	Unknown
TOTAL		**71**	**45**			

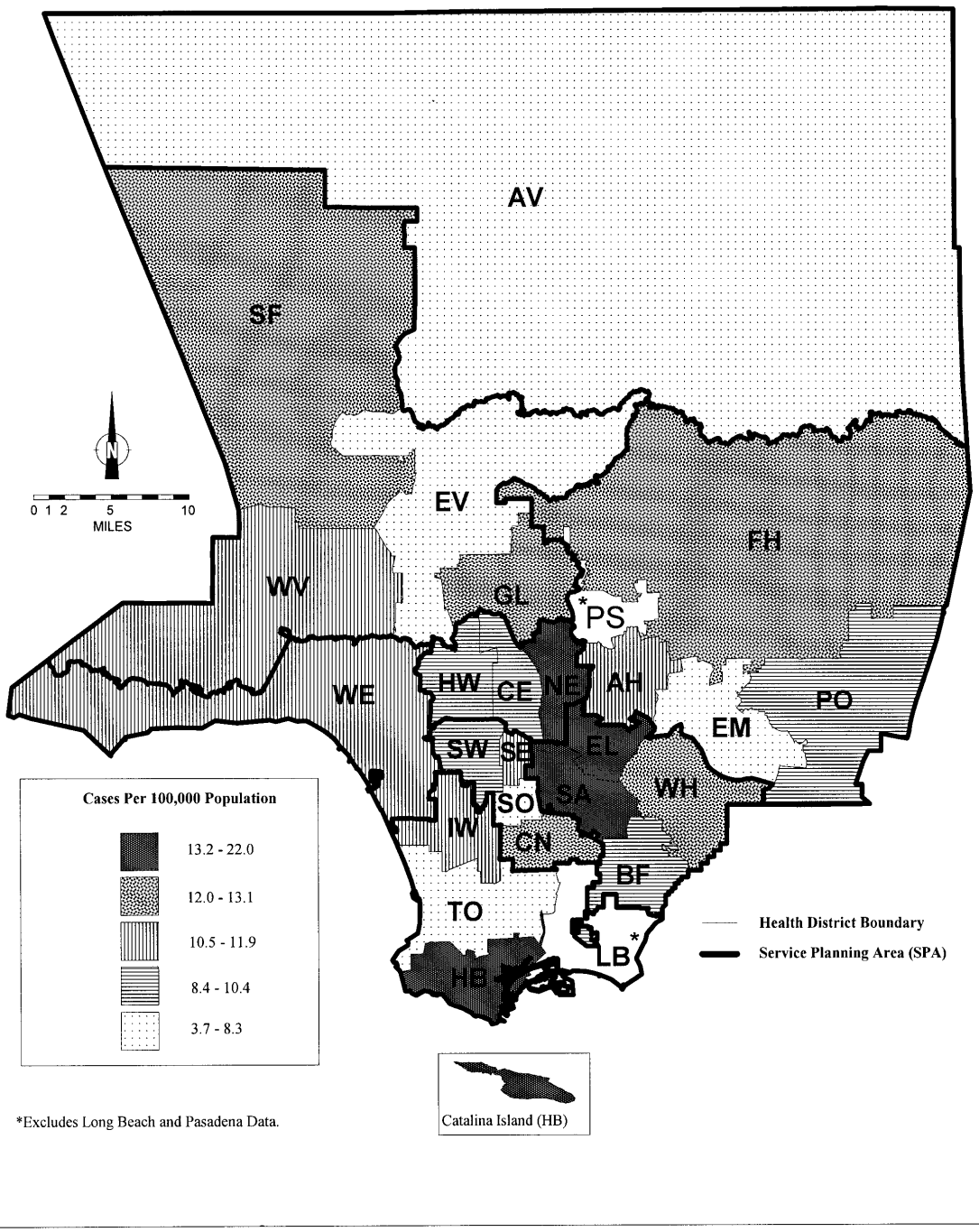
COMMENTS

After a peak in 1994, starting in 1995 through 2000 a steady decline occurred in the LAC rate of salmonellosis. This decline continued, dipping below the national average in 1998 (Figure 1). Specific reasons for the declining rate have not been studied scientifically, but several factors may have contributed. These include the increase in managed care and medical practice guidelines recommending treatment for patients with fever and diarrhea without confirmed diagnosis. Other potential contributing factors include: industry-based programs such as the California Egg Quality Assurance Program and the California Poultry Meat Quality Assurance Program, various government laws and regulations affecting food safety from farm to distribution as well as the increased use of safe food preparation labels on packaged meats. Since 2000 rates of salmonellosis appear to plateau (Figure 1).

During 2003, there were seven reported outbreaks of salmonellosis in LAC. Outbreak-related cases accounted for 4.8% of all culture-confirmed salmonellosis cases. All outbreak related cases (both confirmed and presumptive) make up 11.7% of total cases reported in 2003. *Salmonella* Enteritidis was the number one etiologic agent identified in outbreaks in LAC from 1994-2001 but in the last two years, did not cause any outbreaks. *S*. Typhimurium, the predominant serotype for 2003, did not cause any outbreaks. Two of the seven salmonellosis outbreak investigations cited restaurant prepared food as a source. Other suspected sources were produce (Table 2). The use of PFGE and comparison of PFGE patterns with other laboratories through PulseNet, the national molecular subtyping network for foodborne disease, continues to help identify, potentially related clusters within LAC.

Salmonellosis was reported as a contributing cause of death in seven people, all of whom had underlying health problems such as sepsis, ischemic bowel, and cardiovascular disease. Two of the deceased had aortic aneurysms, one had liver failure and hepatitis C and one was immunocompromised. Six adults' ages ranged from 23-102 years old and one child died of an infected choledochal cyst and septic shock.

MAP 10. Salmonellosis
Rates by Health District, Los Angeles County, 2003*



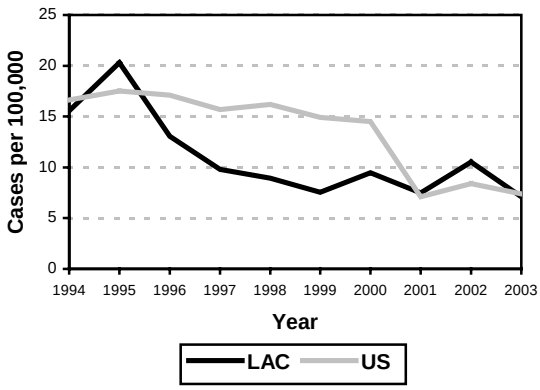
*Excludes Long Beach and Pasadena Data.

SHIGELLOSIS

CRUDE DATA	
Number of Cases	669
Annual Incidence[a]	
LA County	7.12
California	6.46
United States	8.19
Age at Diagnosis	
Mean	18.9
Median	10
Range	<1– 84 years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.

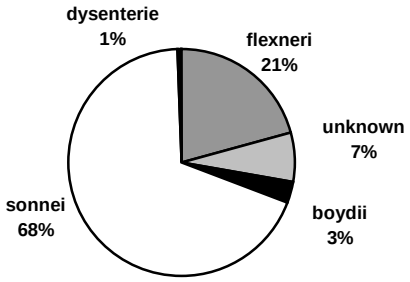
Figure 1
Shigellosis
Incidence Rates by Year of Onset
LAC and US, 1994–2003



DESCRIPTION

Shigellosis is caused by a gram-negative bacillus with four main serogroups: *Shigella dysenteriae* (group A), *S. flexneri* (group B), *S. boydii* (group C) and *S. sonnei* (group D). Incubation period is 1-3 days. Transmission occurs when individuals fail to thoroughly wash their hands after defecation and spread infective particles to others, either directly by physical contact including sexual behaviors or indirectly by contaminating food. Infection may occur with ingestion of as few as 10 organisms. Common symptoms include diarrhea, fever, nausea, vomiting, and tenesmus. Stool may contain blood or mucous. In general, the elderly, the immunocompromised, and the malnourished are more susceptible to severe disease outcomes.

Figure 2
Shigellosis
Percent by serogroup
LAC, 2003
(N=670)



DISEASE ABSTRACT

- There was a 31% decrease in cases in 2003 after a 42% increase in cases, during 2002 (Figure 1).
- Four outbreaks were investigated in 2003.

STRATIFIED DATA

Trends: There was a 31% decrease in the number of cases during 2003. The rate decreased from 10.5 in 2002 to 7.1. The increase of sporadic cases in districts with multifamily dwellings seen in late 2002 was not seen in 2003.

Serotypes: As in most developed countries, *S. sonnei* continues to be the most common serotype seen in LAC followed by *S. flexneri* (Figure 2). Other serotypes identified during 2003 include: *S. boydii* (N=21), *S. dysenterie* (N=3). Sixty-six percent of *S. dysenterie* cases traveled during their incubation period and 38% of *S.boydii* cases traveled.

Seasonality: In 2003, incidence peaked in August (Figure 3). The reason for January's consistently higher number of cases may be due to travel during winter school break. Ten percent of case-related travel took place in late December and early January. Fifty-eight percent of travel took place from July through September.

Age: Children aged 1–4 and 5–14 years again had the highest rates, however, these rates were lower than the five-year average. The rate in persons aged 65 years and older continues to be higher than the five-year average (Figure 4).

Race/Ethnicity: During 2003, Latinos aged 1–4 years again had the highest age-adjusted rate (Figure 5). The reason for the high rate in Latino infants cannot be determined at this time. Overcrowding and the higher overall rate in Latinos may be possible causes.

Sex: The male-to-female rate ratio was 1.2:1. In 2002 the rate ratio was 1:1.

Location: The rates for SPA 4 and SPA 6 were again significantly higher than the county average. One outbreak occurred in SPA 4. The majority of MSM cases (74%) were again seen in SPA 4.

Severity of Illness: Twenty-one percent of reported shigellosis cases were hospitalized for at least two days. There were no shigellosis-associated deaths reported in 2003.

Risk Factors: Exposure to a case inside or outside the household (29%) and exposure during travel (18%) were the most commonly reported potential sources of infection. The majority of travel associated illness (62% n=62) involved visiting Mexico. Five percent of cases were in MSM.

Figure 3
Shigellosis
Cases by Month of Onset
LAC, 2003

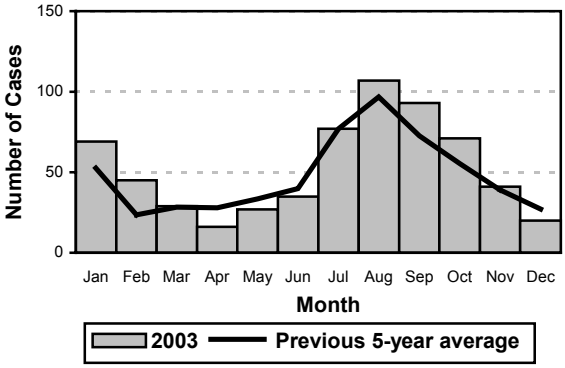


Figure 4
Shigellosis
Incidence Rates by Age Group
LAC, 2003

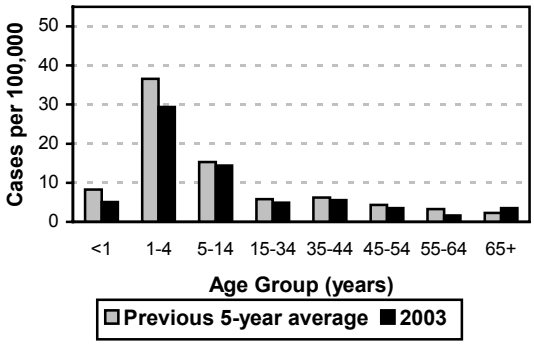
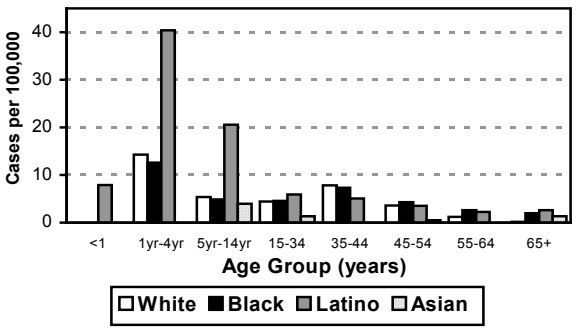


Figure 5
Shigellosis Incidence Rates
by Age Group and Race
LAC, 2003 (N=659)



PREVENTION

Careful handwashing is important in preventing this disease. Handwashing is especially important when out in crowded areas such as amusement parks or shopping malls. Children should not be allowed to swim or wade while ill with diarrhea; children in diapers

should never be allowed in public swimming areas. Swimming or wading in areas not designated for such activities should be avoided, especially in areas where there are no toileting or handwashing facilities. In LAC, cases and symptomatic contacts in sensitive occupations or situations (e.g., food handling, healthcare workers) are routinely removed from work or the situation until they have culture negative stool specimens tested in the Public Health Laboratory.

COMMENTS

There were four outbreaks investigated in 2003; three were community outbreaks including a multi-household, a shelter and a babysitting group outbreak. All of these outbreaks appear to be from person-to-person transmission. One outbreak occurred in a home for the developmentally disabled. There were no restaurant-related shigellosis outbreaks reported in 2003.

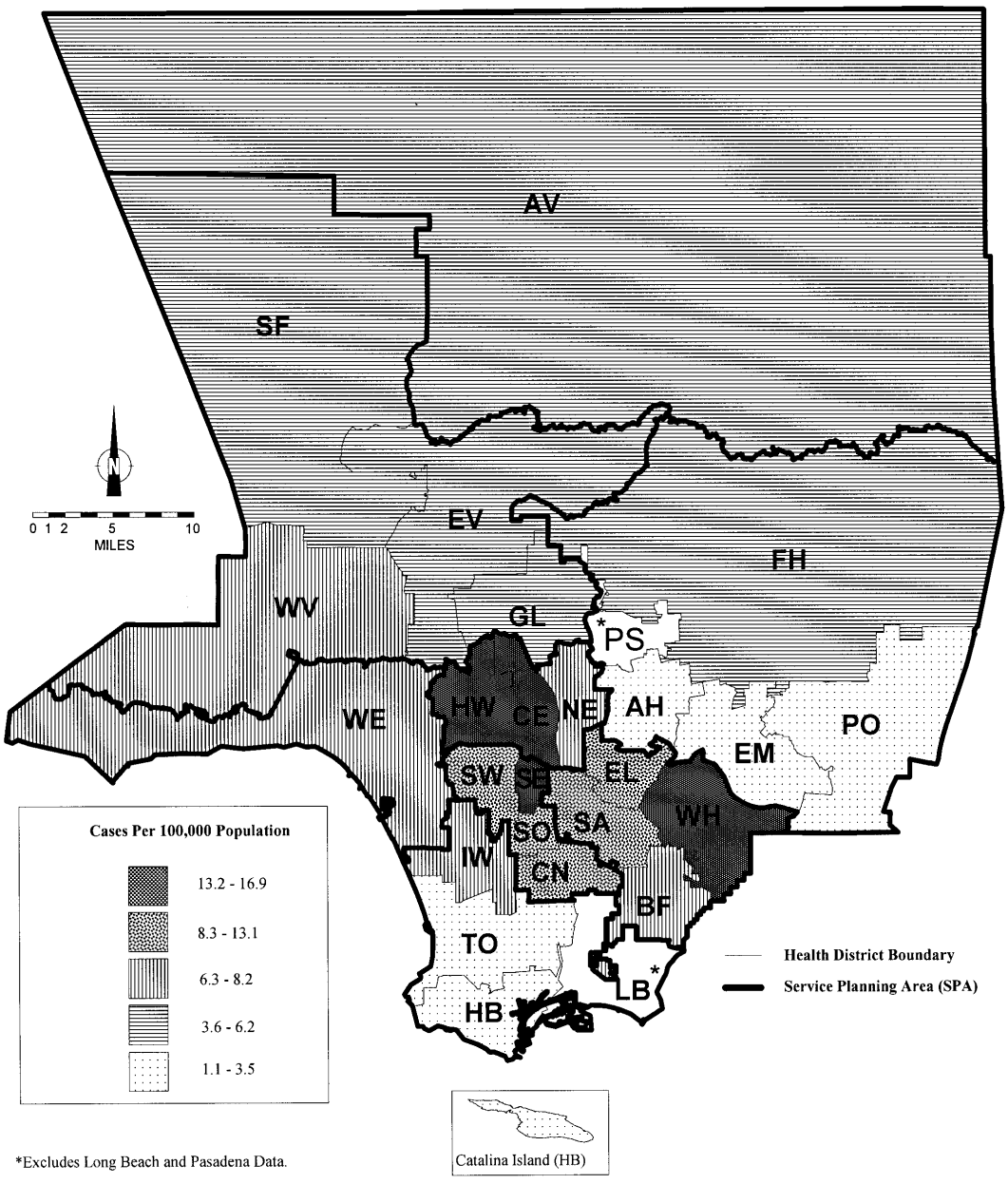
Certain sexual practices—especially those in which there is direct contact with fecal material—are a potential source of infection. There were 35 shigellosis cases reported in MSM. No links could be established among these cases. *S. flexnerii* (54%) was the predominant serotype in this risk group; in 2002 the predominant serotype was *S. sonnei* (56%).

ADDITIONAL RESOURCES

General information about shigellosis is available at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/shigellosis_g.htm

General information and reporting information about this and foodborne diseases in LAC is available at:
www.lapublichealth.org/acd/food.htm

MAP 11. Shigellosis
Rates by Health District, Los Angeles County, 2003*



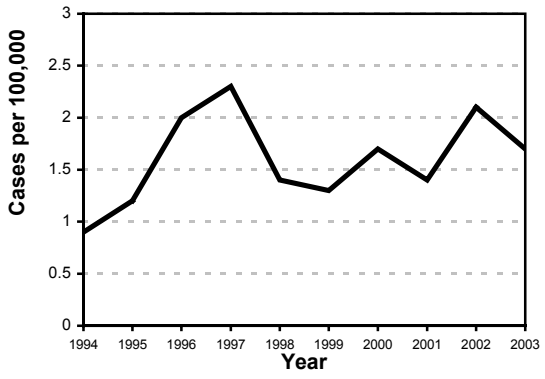
*Excludes Long Beach and Pasadena Data.

INVASIVE GROUP A STREPTOCOCCUS (IGAS)

CRUDE DATA	
Number of Cases	157
Annual Incidence[a]	
LA County	1.67
United States	N/A
Age at Diagnosis	
Mean	49
Median	50
Range	<1–91 years
Case Fatality	
LA County	10%
United States	N/A

[a] Cases per 100,000 population.

Figure 1
IGAS
Incidence Rates by Year of Onset
LAC, 1994–2003



DESCRIPTION

Invasive Group A Streptococcal (IGAS) disease is caused by the group A beta-hemolytic *Streptococcus pyogenes* bacterium. Transmission is by direct or, rarely, indirect contact. For surveillance purposes in LAC, IGAS is defined as isolation of *Streptococcus pyogenes* from a normally sterile body site (e.g., blood, cerebrospinal fluid, synovial fluid, or from tissue collected during surgical procedures), or from a non-sterile site if associated with streptococcal toxic shock syndrome (STSS) or necrotizing fasciitis (NF). Illness manifests as various clinical syndromes, including: bacteremia without focus; sepsis; cutaneous wound, or deep soft-tissue infection; septic arthritis; and pneumonia. IGAS occurs in all age groups but is most common among the very old. Infection can result in severe illness and death.

In 2003, case patients with a culture positive for GAS from a normally sterile site were categorized as IGAS, with or without identification of a clinical syndrome. Case patients were categorized as STSS if, in addition to a culture positive for GAS, they meet the CDC/Council of State and Territorial Epidemiologists (CSTE) case definition for this syndrome. Case patients were categorized as NF with a culture positive for GAS from a normally sterile or nonsterile site if the diagnosis was made by the treating physician because there is no CDC or CSTE case definition for this syndrome.

DISEASE ABSTRACT

- The number of cases decreased from the previous year.
- Cases were sporadic and unassociated. No clusters or outbreaks were reported.

STRATIFIED DATA

Trends: The number of cases reported decreased in 2003. However, the number of cases of STSS and NF was comparable to those in the previous year (Table 1).

Table 1: Frequency of IGAS, STSS and NF—LAC, 1994–2003					
	IGAS	STSS		NF	
Year	N	N	% IGAS	N	% IGAS
1994	83	29	34.9	18	21.7
1995	103	16	15.5	17	16.5
1996	175	9	5.1	13	7.4
1997	205	7	3.4	9	4.4
1998	128	8	6.3	13	10.2
1999	114	6	5.3	11	9.7
2000	154	8	5.2	20	13.0
2001	127	3	2.4	15	11.8
2002	192	5	2.6	13	6.8
2003	157	4	2.5	10	6.4

Seasonality: Cases occurred throughout the year. The pronounced winter/spring seasonality, commonly associated with streptococcal pharyngitis, continued into the summer (Figure 2).

Age: Incidence was highest among those aged over 65 (4.9 cases per 100,000 population). The incidence in infants <1 year of age decreased substantially from 2002 (from 8.0 to 2.2 per 100,000 population, Figure 3). No reason for the decrease in this age group was apparent.

Gender: The male-to-female rate ratio was 1.61:1.

Race/Ethnicity: Race/ethnicity was known for 88% of cases. Of these, 36% were White, 44% were Latino, 9% were Black, and 12% were Asian.

Figure 2
IGAS
Cases by Month of Onset
LAC, 2003

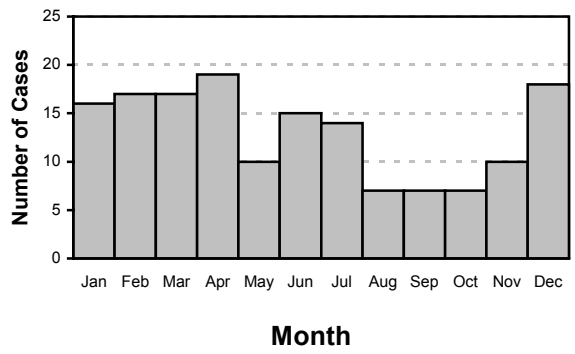
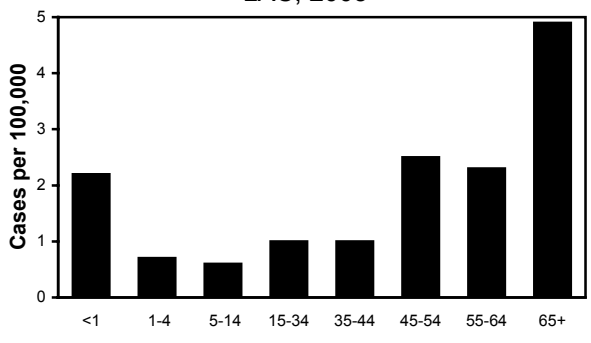


Figure 3
IGAS
Incidence Rates by Age Group
LAC, 2003



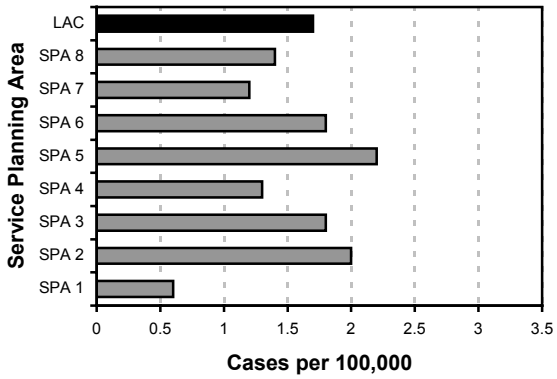
Location: The crude incidence rate was highest in SPA 5 (2.2 cases per 100,000 population), compared with a mean of 1.7 per 100,000 for all of LAC (Figure 4). However, many of the rates are unstable because they are based on small numbers of reported cases.

Clinical Syndromes: The clinical presentation of 111 cases (71%) was available. Thirty cases were reported more than one clinical syndrome (Table 2).

The majority of cases were categorized as cellulitis, bacteremia or nonsurgical wound infection. In contrast, in 2002 the majority of cases were categorized as sepsis, necrotizing fasciitis or septic arthritis.

Of the 10 cases of NF, the mean age was 49 years, the median was 45 years and the range was 33 years to 78 years. Seventy percent were male. The outcome of four cases was unknown but no deaths were reported.

Figure 4
IGAS
Rates by Service Planning Area
LAC, 2003



COMMENTS

Although IGAS disease is not a mandated reportable disease in California, the ACDC program has required laboratories, hospitals, and healthcare providers to report IGAS since 1993. In 2003, 80% of cases were reported by hospitals or healthcare providers and 20% were reported by laboratories. Overall, there was a 19% decrease in the number of cases reported. A reason for the decrease was not apparent.

In 2003, use of a new epidemiology form for collection of specific standardized clinical and laboratory information on IGAS cases was initiated, and detailed case information was obtained on 71% of cases. As a consequence, clinical and outcome data for 2003 more accurately reflect IGAS disease in LAC.

Table 2: Frequency and Percentage of IGAS Clinical Syndromes—LAC, 2003 (N=III)

Syndrome	N	Percent
Cellulitis	41	26
Nonsurgical wound infection	26	17
Bacteremia	26	17
Pneumonia	19	12
Necrotizing fasciitis	10	6
Septic arthritis	6	4
Osteomyelitis	5	3
Other	34	22

ADDITIONAL RESOURCES

For more information about IGAS visit:

- CDC – www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm
- National Institute of Health – www.niaid.nih.gov/factsheets/strep.htm

<u>IGAS Publications</u>:

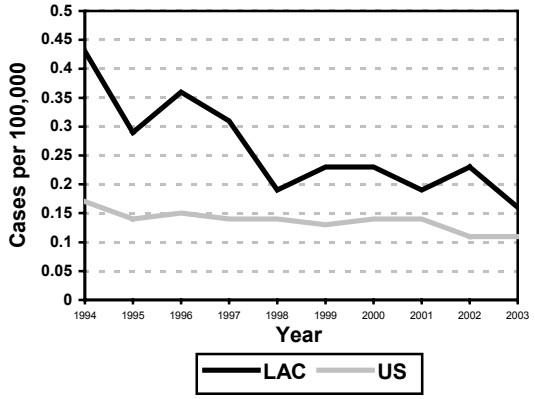
- The Working Group on Prevention of Invasive Group A Streptococcal Infections. Prevention of Group A streptococcal disease among household contacts of case-patients and among Postpartum and
- Postsurgical Patients: Recommendations from the Centers for Disease Control and Prevention. *Clin Infec Dis* 2002:35:950-9.
- O'Brien KL, Beall B, Barret NL, et al. Epidemiology of invasive group A streptococcal disease in the United States, 1995-1999. *Clin Infec Dis* 2002;36:268-276.
- American Academy of Pediatrics. Committee on Infectious Diseases. Severe invasive group A streptococcal infections: a subject review. *Pediatrics.* 1998;101:136-40.
- Kaul R, McGeer A, Low D, et al. Population-based surveillance for group A streptococcal necrotizing fasciitis: clinical features, prognostic indicators, and microbiologic analysis of seventy-seven cases. *Am J Med* 1997;103:18-24.

TYPHOID FEVER, ACUTE

CRUDE DATA	
Number of Cases	16
Annual Incidence[a]	
LA County	0.16[b]
California	0.25
United States	0.11
Age at Diagnosis	
Mean	23.4
Median	13
Range	4–55
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.

Figure 1
Acute Typhoid Fever
Incidence Rates by Year of Onset
LAC* and US, 1994–2003



* Rates based on less than 20 observations are unreliable.

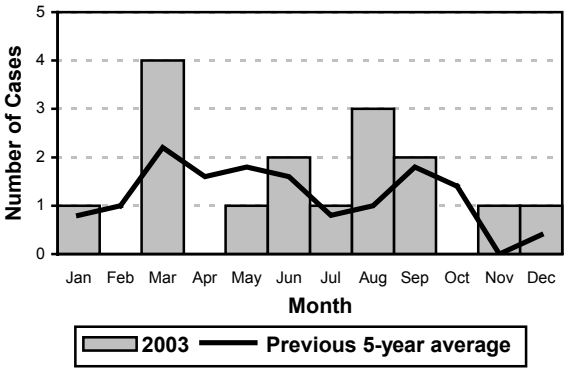
DESCRIPTION

Typhoid fever, or "enteric fever," is an acute systemic disease caused by the gram-negative bacillus *Salmonella typhi*. Transmission may occur person-to-person or by ingestion of food or water contaminated by the urine or feces of acute cases or carriers. Common symptoms include insidious onset of persistent fever, headache, malaise, anorexia, constipation (more common than diarrhea), bradycardia, enlargement of the spleen, and rose spots on the trunk. Humans are the only known reservoir for *S. typhi*. Vaccine is available to those at high risk or travelers.

DISEASE ABSTRACT

- Travel was again the most common risk factor with 63% of cases reporting visits to typhoid endemic countries.
- School aged children represented 50% of all cases.

Figure 2
Acute Typhoid Fever
Cases by Month of Onset
LAC, 2003



STRATIFIED DATA

Trends: Compared to the previous year**,** there were 51% fewer cases in 2003. The difference is attributed to the two outbreaks reported in 2002 and no outbreaks reported in 2003. Sixteen is the fewest cases reported in LAC in twenty years.

Seasonality: Fifty percent of cases occurred during the summer months. In previous years, most cases occurred

in late spring and summer, coinciding with holidays and school vacations (Figure 2). March has also consistently had more cases as indicated by the 5-year average.

Age: In 2003, children aged 5–14 years continued to have a high incidence (50%; n=8, Figure 3). Most of these children (89%) were born in the USA, but 78% of these children had traveled to countries where typhoid fever is endemic. Travel dates for these children did not necessarily coincide with school vacations in the spring, summer and winter.

Sex: The male-to-female ratio was 1:1.6. The female preponderance seen in 2002 and 2003 may be due to the decreasing number of reported cases.

Race/Ethnicity: In 2003, typhoid fever cases were again seen primarily in Latinos, who accounted for 56% of cases (Figure 4).

Location: Cases resided in one of four SPAs—SPA 2 (31%), SPAs 6 and 7 (25% each) and SPA 8 (19%).

Figure 3
Acute Typhoid Fever
by Age Group
LAC, 2003

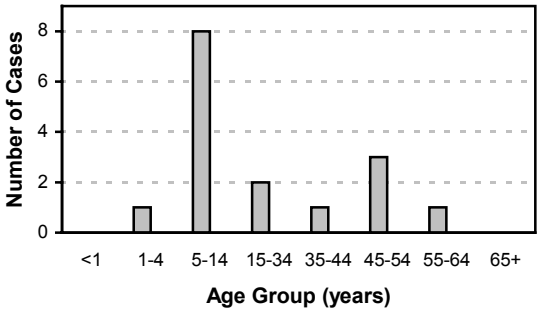
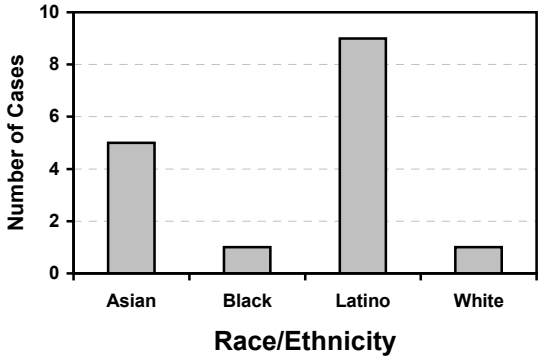


Figure 4
Acute Typhoid Fever
by Race/Ethnicity
LAC, 2003



PREVENTION

Handwashing after using the toilet, before preparing or serving food, and before and after caring for others is important in preventing the spread of typhoid. When traveling to locations where sanitary practices are uncertain, foods should be thoroughly cooked and served hot; bottled water should be used for drinking as well as for brushing teeth and making ice. Vaccination should be considered when traveling in areas of high endemicity. LAC tests household contacts of confirmed cases for *S typhi* to identify and previously undiagnosed carriers or cases.

COMMENTS

The majority of the cases (n=10, 63%) traveled to endemic areas outside the US; Mexico, Guatemala, India and Nigeria were reported travel destinations. Four cases (25%) denied specific foreign travel. One case had household contacts (HHCs) born in a typhoid endemic country; the contacts were culture negative. Another case moved between LAC and another jurisdiction. HHCs in LAC were culture negative; the other jurisdiction declined to test the household. One case was infected by a previously undiagnosed carrier.

ADDITIONAL RESOURCES

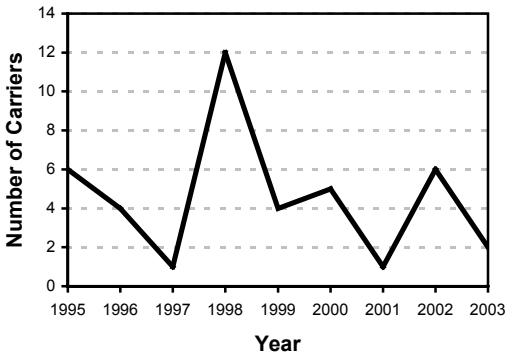
General information about typhoid fever available from CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/typhoidfever_g.htm

Traveler's health information is available at: www.cdc.gov./travel/diseases/typhoid.htm

TYPHOID FEVER, CARRIER

CRUDE DATA	
Number of New Carriers	2
Total Number of Carriers	15
Annual Incidence[a]	
LA County	N/A[b]
United States	N/A
Age at Diagnosis	
Mean	35 years
Case Fatality	
LA County	N/A
United States	N/A

Figure 1
Typhoid Fever Carriers
by Year of Detection
LAC, 1995–2003



[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.

DESCRIPTION

The chronic typhoid carrier state can occur following symptomatic or subclinical infections of *Salmonella typhi*. Among untreated cases, 10% will shed bacteria for three months after initial onset of symptoms and 2-5% will become chronic carriers. The chronic carrier state occurs most commonly among middle age women.

DISEASE ABSTRACT

- In 2003, seven carriers were closed to follow-up; two expired due to non-typhoid related causes and five were cleared according to protocol.
- During 2003, a total of 15 carriers were under case management in LAC.

COMMENTS

Both new carriers were foreign born; both were female. One previously unknown carrier was found while testing household contacts to a new acute typhoid case. The other carrier was identified during diagnostic tissue culture. Upon identification, each new carrier is added to the typhoid carrier registry. All carriers are visited semi-annually by a public health nurse to assess and emphasize compliance with a signed typhoid carrier agreement.

ADDITIONAL RESOURCES

Additional information is available from CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/typhoidfever_g.htm

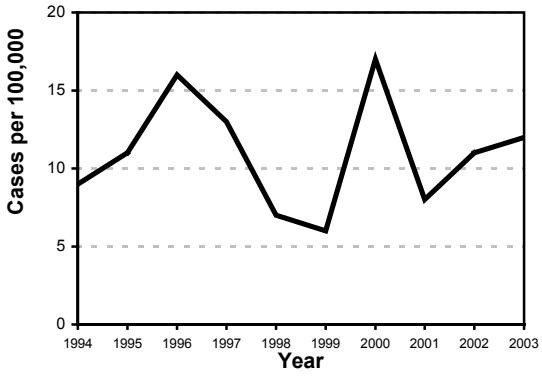
TYPHUS FEVER

CRUDE DATA	
Number of Cases	12
Annual Incidence[a]	
LA County	---[b]
United States	N/A
Age at Diagnosis	
Mean	42
Median	45
Range	16–60 years
Case Fatality	
LA County	0.0%
United States	N/A

[a] Cases per 100,000 population.

[b] Rates based on less than 20 observations are unreliable.

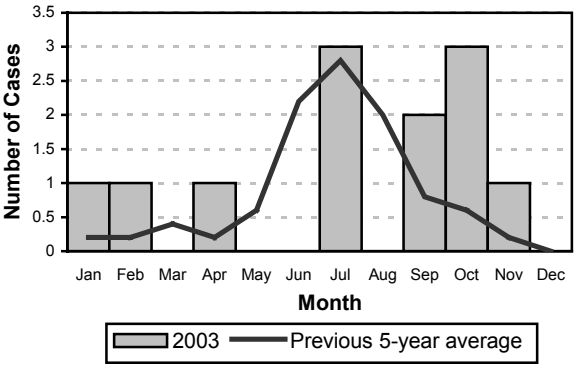
Figure 1
Murine Typhus
Cases by Year of Onset
LAC, 1994–2003



DESCRIPTION

Typhus fever (murine typhus, endemic typhus) is caused by bacteria, *Rickettsia typhi* and *R. felis*, and transmitted through the bite or contact with feces of an infected flea. Most reported cases of typhus reside in the foothills of central LAC. Reservoir animals are predominantly rats and other small mammals that live in areas with heavy foliage. Symptoms include fever, severe headache, chills, and myalgia. A fine, macular rash may appear three to five days after onset. Occasionally, complications such as pneumonia or hepatitis may occur. Fatalities are uncommon, occurring in less than 1% of cases. The disease is mild in young children. Typhus infection is not vaccine preventable, but can be treated with antibiotics.

Figure 2
Murine Typhus
Cases by Month of Onset
Los Angeles County, 2003



DISEASE ABSTRACT

- Cases occur more often in summer and fall. In 2003, the majority of cases (n=8, 67%) occurred during July, September and October.
- Nine cases (82%) were hospitalized—there were no fatalities.

STRATIFIED DATA

Location: Of the 12 cases, 4 were residents in Alhambra, 5 lived in Foothill, 2 in Glendale, and 1 in West Valley health district. Typhus is endemic in the foothills of central LAC and rats, opossum, and cats from these areas have tested positive for typhus group *Rickettsia* antibodies. The reasons for this localized endemic area are unclear.

Transmission and Risk Factors: Human infection most commonly occurs by introduction of infectious flea fecal matter into the bite site or into adjacent areas that have been abraded by scratching. Most cases observed small mammals (e.g., rats, opossums, dogs and cats) in their yards, and thus may have had exposure to animals that carry fleas. Typhus infection cannot be transmitted from person to person.

PREVENTION

Typhus infection can be prevented through flea control measures implemented on pets and in the yard. Foliage in the yard should be kept trim so that it does not provide harborage for small mammals. Screens can be placed on windows and crawl spaces to prevent entry of animals into the house.

COMMENTS

Each case of endemic typhus is carefully interviewed regarding potential exposures. If possible, field studies of the property where exposure occurred and surrounding areas in the neighborhood are conducted. In addition, local residents are contacted and provided with education about typhus and prevention of the disease by controlling fleas and eliminating harborage for potentially typhus-infected animals that carry fleas.

The nonspecific clinical presentation and the lack of a definitive test during the acute phase of the illness make the early diagnosis of endemic typhus difficult. Thus, diagnosis of endemic typhus depends on the clinical acumen of the treating physician, and is often confirmed after the patient has recovered. Accurate reporting of typhus or suspect typhus cases is important to identify endemic areas in LAC which can be monitored for the presence of disease in the animal populations and to institute control measures. Treatment with antibiotics hastens recovery and lessens the chance of complications.

ADDITIONAL RESOURCES

General information about murine typhus is available from the ACDC website at:
www.lapublichealth.org/acd/vectormurine.htm

Publications:

Azad AF, Radulovic S, Higgins JA, Noden BH and Troyer JM. Flea-borne rickettsioses: ecologic considerations. Emerg Infect Dis 1997;3:319–27.

Sorvillo FJ, Gondo B, Emmons R, Ryan P, Waterman SH, Tilzer A, Andersen EM, Murray RA, and Barr AR. A suburban focus of endemic typhus in LAC: association with seropositive domestic cats and opossums. Am J Trop Med Hyg 1993;48:269–73.

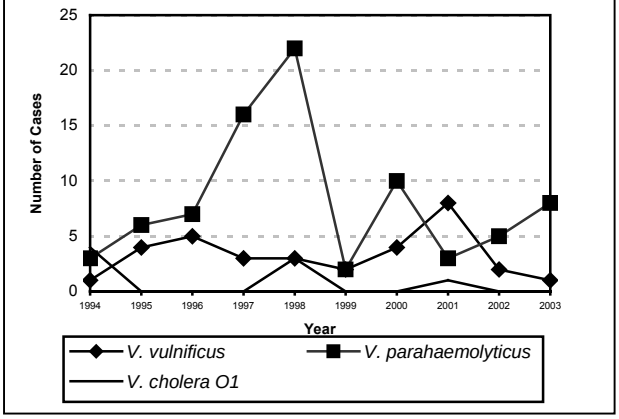
Williams SG, Sacci JB Jr, Schriefer ME, et al. Typhus and typhuslike rickettsiae associated with opossums and their fleas in Los Angeles County, California. J Clin Microbiol 1992;30:1758–62.

VIBRIOSIS

CRUDE DATA	
Number of Cases	13
Annual Incidence[a]	
LA County	---[b]
United States	N/A
Age at Diagnosis	
Mean	43
Median	38
Range	31–65 years
Case Fatality	
LA County	7.7%
United States	varies by species

[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.
[c] Deaths from *V. vulnificus* (n=2) had a 100% case fatality.

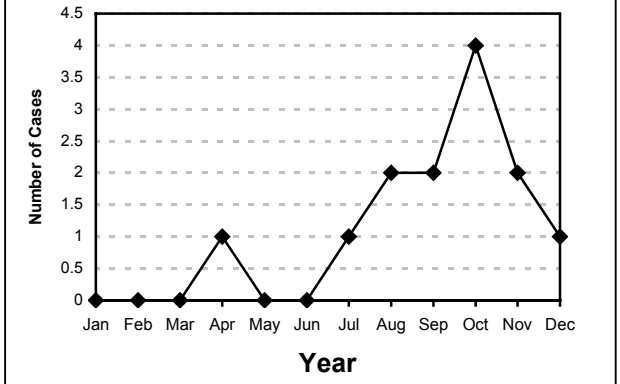
Figure 1
Selected Vibrio Species
Cases by Year of Onset
LAC, 1993–2002



DESCRIPTION

The genus Vibrio consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion of the bacteria via a foodborne route, but also from contact of non-intact skin with seawater. Presenting symptoms vary by infecting species and mode of transmission. The vibrio species of greatest public health importance are: *V. vulnificus* which presents as a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. cholerae* O1 which is most often travel associated. Both *V. cholerae* O1 and *V. parahaemolyticus* present as a gastrointestinal illness.

Figure 2
Vibriosis
Cases by Month of Onset
LAC, 2003



DISEASE ABSTRACT

- Thirteen cases of Vibrio species were reported in 2003, similar to the previous year (N=14).
- One fatal case of *Vibrio vulnificus* was reported in 2003, with a history of oyster consumption.

STRATIFIED DATA

Trends: Over the last 10 years, case numbers of Vibrio infections peaked in 1998 with 36 reports. Reported cases of *Vibrio vulnificus* decreased to 1 case in 2003, a substantial decline compared the 10-year peak of eight cases occurring during in 2001 (Figure 1).

Seasonality: Among reported vibriosis cases with distinct onset dates, the majority (77%, n=10) occurred between August and November (Figure 2) a little later than usual. Vibrio infections typically increase during the warmer summer months.

Age: Vibrio cases were all adults (Table 1).

Sex: Over two-thirds of the cases were male (69%, n=9, Table 1).

Race/Ethnicity: Reported cases were most often Latino (54% n=7, Table 1).

Severity: For surviving vibriosis cases with data of distinct onsets and resolution dates (n=9), duration of illness averaged 4 days (range 1–9). Two vibrio cases required hospitalization for their infection. One fatal Vibrio case was reported due to *V. vulnificus*.

Table 1: Vibrio Cases by Species, Race, Age and Sex—LAC, 2003

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
V. vulnificus	1	Latino (1)	55	1:0
V. parahaemolyticus	8	Latino (3), Asian (4), White (1)	37 (31–48)	1:1
V. cholerae non-O1	2	Latino (2)	55 (45–65)	2:1
V. other species*	2	Latino (1), Unknown (1)	47 (38-56)	2:0

* other species include *V. fluvialis* and *V. alginolyticus*

Species-specific Risk Factors:

- Vibrio vulnificus
The number of V*. vulnificus* cases decreased to 1 in 2003 from a 10-year peak of 8 in 2001. The case in 2003 was fatal. Risk factor data indicated the case had seafood exposure, specifically raw oyster consumption. The case in 2003 fit the LAC *V. vulnificus* profile of being an adult Latino male with pre-existing liver disease. Investigation of *V. vulnificus* can be hampered since cases may be too ill to give a reliable history.

- Vibrio parahaemolyticus
Eight cases of *V. parahaemolyticus* were reported during 2003, an increase from the previous year's total(n=5). All eight were identified through stool culture, one required hospitalization. Four of the cases were part of an outbreak associated with a Dim Sum restaurant; all remembered eating shrimp. Out of the other four cases, two recalled raw oyster consumption and one ate raw shrimp.

COMMENTS

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of food (especially raw fish and shellfish) or drink. Infection with *V. vulnificus* is a particular risk for persons with pre-existing liver disease, frequently leading to soft tissue invasion, limb amputation, and a high case fatality. Adult males may be more at risk for Vibrio infections because of their tendency to engage in behaviors exposing them to seawater contamination or higher levels of raw or partially cooked seafood consumption, especially oysters.

ADDITIONAL RESOURCES

Mouzin E, Mascola L, Tormey M, Dassey DE. Prevention of Vibrio vulnificus infections. Assessment of regulatory educational strategies. JAMA 1997; 278(7):576–578. Abstract available at: www.jama.ama-assn.org/cgi/content/abstract/278/7/576

Disease information regarding *Vibrio vulnificus* is available from the CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm

Disease information regarding *Vibrio parahaemolyticus* is available from the CDC at:
www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus_g.htm

DISEASE OUTBREAK SUMMARIES

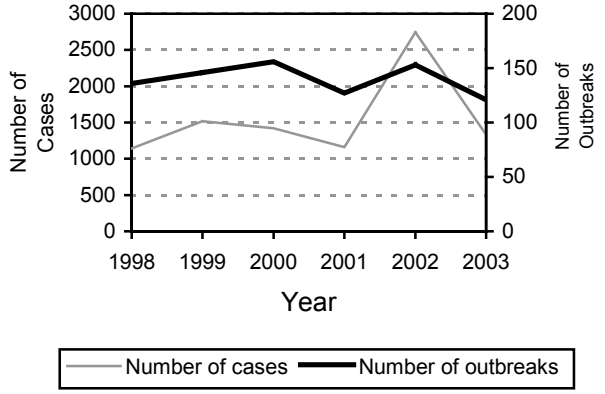
2003

COMMUNITY-ACQUIRED DISEASE OUTBREAKS

ABSTRACT

- In 2003, 121 community-acquired disease outbreaks accounted for 1332 cases of illness (Figure 1).
- Schools were the most common setting of community-acquired outbreaks (59%).

Figure 1
Community Acquired Outbreaks
Number of Persons Affected
LAC, 1998–2003



DATA

Disease outbreaks are defined as clusters of illness that occur in a similar time or place, or unusual numbers of disease cases above baseline in a specified area. Depending on the nature of the outbreak, investigation responsibility is maintained by either ACDC or by Community Health Services, with ACDC providing consultation as needed. The community outbreaks reported in this section do not include outbreaks associated with food (see Foodborne Outbreaks) or facilities where medical care is provided (see Healthcare Associated Outbreaks).

Most reported community outbreaks in LAC were due to varicella, followed by ectoparasites (scabies and pediculosis) comprising 23% and 21% of all community outbreaks respectively. Third most common were strep throat/strep and gastroenteritis (GE) outbreaks of various causes, each accounting for 17% of all outbreaks. Collectively these diseases accounted for 77% of all community outbreaks (Figure 2, Table 1).

The most common settings for illness transmission were schools—elementary (n=68) and middle schools (n=3), accounting for 59% of all outbreaks. Settings with young children in daycare or pre-school accounted for 19% (n=23) of all outbreaks. Group and retirement home settings were the third most common site of the community outbreaks reported in 2003 with 11% (Figure 3).

The outbreaks with the most cases tended to be due to norovirus and influenza—most likely reflecting how easily these etiologies can be transmitted from person-to-person. While the overall number of varicella outbreaks went down from 2002 to 2003, the size of the outbreaks that occurred remained the same with 10 cases per outbreak.

Figure 2
Outbreaks by Type of Disease*
LAC, 2003 (N=121)

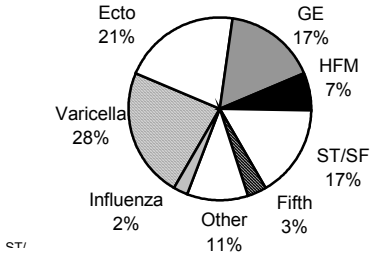
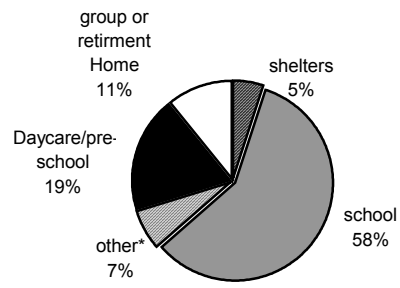


Figure 3
Community Outbreaks by Setting
LAC, 2003 (N=121)



*other includes tutoring group (1), households (1), camp (1) , facility (2), and jails (2)

Table 1. Community Outbreaks by Disease—LAC, 2003[a]

Disease	No. of outbreaks	No. of cases	Cases per outbreak (average)	Cases per outbreak (range)
Varicella	28	268	10	4–28
Scarlet fever/strep throat	20	196	10	2–28
Scabies	12	71	6	2–23
Hand, foot & mouth disease	8	43	5	2–11
Pediculosis	13	101	8	3–26
GE illness - Norovirus	8	209	26	6–61
GE illness - Shigella	3	30	10	5–19
GE illness – Other, unknown	9	134	15	4–38
Fifth disease	4	46	12	7–17
Influenza	3	94	31	22–37
Other[b]	13	140	11	3–22
Total	**121**	**1,332**	**11**	**2–61**

[a] Excludes foodborne outbreaks.
[b] Includes conjunctivitis, herpes simplex, ringworm, unknown respiratory illness and unknown rash.

Table 2. Community Outbreaks: Disease by Setting—LAC, 2003

Disease	Group Home[a]	School[b]	Preschool or Daycare	Shelter	Other[c]	TOTAL
Varicella	0	25	0	0	3	**28**
Scarlet fever/strep throat	0	15	5	0	0	**20**
Scabies	5	0	4	1	2	**12**
Hand, foot & mouth disease	0	3	5	0	0	**8**
Pediculosis	2	9	0	1	1	**13**
GE illness – Norovirus	4	2	1	1	0	**8**
GE illness – Shigella	1	1	0	1	0	**3**
GE illness – Undetermined	0	1	4	2	2	**9**
Fifth disease	0	4	0	0	0	**4**
Influenza	0	2	1	0	0	**3**
Other	1	9	3	0	0	**13**
Total	**13**	**71**	**23**	**6**	**8**	**121**

[a] Includes centers for retirement, rehabilitation and the developmentally disabled.
[b] Includes elementary, middle and high schools. No high schools reported outbreaks in 2003.
[c] Includes jails, workplaces, universities/colleges, camp and private homes.

COMMENTS

In contrast to 2002 with a reported 153 outbreaks, the year 2003 had the lowest level of outbreaks reported in the last 5 years. The decrease in outbreaks from the previous year occurred across the diseases categories. Varicella had the most noticeable decrease from 43 outbreaks to 28—a 35% drop. Varicella remained the most common cause of community-acquired outbreaks in LAC since 1999. Overall GE illness outbreaks went down, yet increase lab capabilities allowed improved diagnosing abilities and more GE outbreaks were recognized as norovirus. Only the disease category of scarlet fever/strep throat increased from the previous year—16 to 20 reported outbreaks.

Community-based outbreaks tended to occur in settings associated two age-specific groups. The clear majority was in pre-teen aged children in elementary schools (n=71) or in pre-school/daycare settings

(n=23). Varicella, strep throat/scarlet fever and pediculosis (head lice) are most common in this young group. The second group is in the older population in group-home settings (n=13). In this age category, scabies and norovirus are most common (Table 2). The incidence of norovirus has increased in the last two years with additional reports from long-term medical care institutions (see Healthcare Associated Outbreaks and Special Reports).

FOODBORNE OUTBREAKS

DESCRIPTION

Foodborne outbreaks are caused by a variety of bacterial, viral, and parasitic pathogens, as well as toxic substances. To be considered a foodborne outbreak, CDC requires at minimum the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food.[1]

The system used by LAC DHS for detection of foodborne outbreaks begins with a Foodborne Illness Report (FBIR). This surveillance system monitors complaints from residents, illness reports associated with commercial food facilities, and foodborne exposures uncovered during disease-specific case investigations (e.g., *Salmonella, Shigella, Campylobacter*). LAC Environmental Health Services Food and Milk (F&M) Program investigates each FBIR by contacting the reporting individual and evaluating the public health importance and need for immediate follow-up. When warranted, a thorough inspection of the facility is conducted. In 2003, 61% of FBIRs led to an on-site investigation of the facility—this is often sufficient public health action to prevent additional foodborne illnesses.

ACDC Food and Water Safety Program also reviews all FBIRs. Typically, an epidemiologic investigation will be initiated when there are illnesses in multiple households, multiple reports from the same establishment with similar symptoms in a short period of time, or ill individuals who attended a large event with the potential for others to become ill.

Figure 1
Foodborne Outbreaks
Number of Persons Affected
LAC, 1999–2003

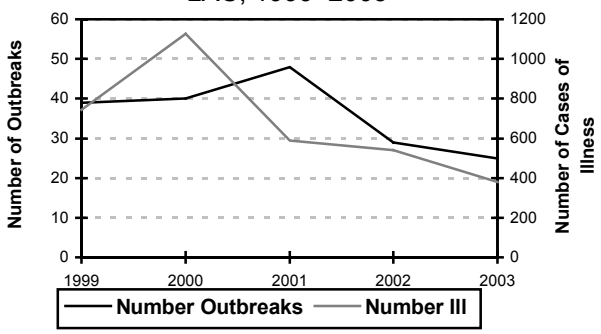


Figure 2
Foodborne Outbreaks
by Etiologic Agent Category
LAC, 1999–2003

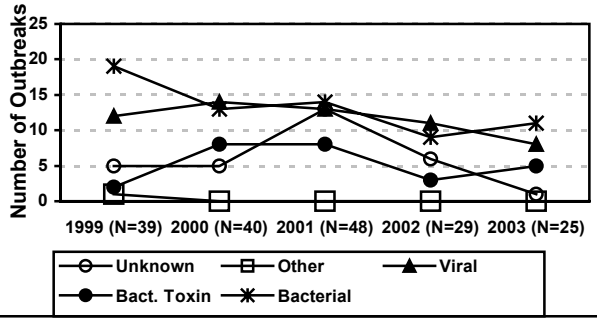
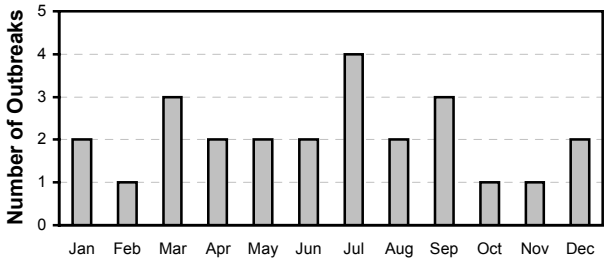


Figure 3
Foodborne Outbreaks
by Month of Onset
LAC, 2003 (N=25)



DISEASE ABSTRACT

- In 2003, the number of outbreaks investigated was less than the previous four years. The overall number of cases of individual illness was also lower than the previous four years (Figure 1).
- A food item was implicated in 40% of the foodborne outbreaks.
- Probable contributing factors were determined for 48% of the outbreaks investigated (Figure 8).

1 CDC. Surveillance for foodborne disease outbreaks—United States, 1988–1992. MMWR 1996; 45(SS-5):58. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00044241.htm

DATA

Overview: Of the 1622 FBIRs in 2003 from consumers eating food from establishments located in LAC, F&M investigated 994 (61%), Some of the FBIRs (n=122, 8%) were multiple reports filed for the same establishment. ACDC investigates foodborne outbreaks with the greatest public health importance. In 2003, ACDC investigated 25 foodborne outbreaks representing 379 cases of foodborne illness (Table 1, Figure 1). These outbreaks were caused by a variety of pathogens (Figure 2). The mean number of cases per foodborne outbreak was 15 (range 2–65 cases). There were no waterborne outbreaks reported in 2003. There were no foodborne outbreaks in health facilities.

Seasonality: In 2003 there were peaks of foodborne outbreaks in March, July, and September (Figure 3).

Agent: Typical foodborne pathogens can be categorized according to common characteristics of illness. The categories used in this report include five types of pathogens (Figure 2). Bacterial agents that cause infection include *Salmonella, Campylobacter* and *E.coli*. Bacteria that produce toxins include *Staphylococcus aureus, Clostridium perfringens,* and *Bacillus cereus*. Viral gastroenteritis (Viral GE) includes the noroviruses (NV) of the *Caliciviridae* family. The "other" category includes hepatitis A virus, fish poisonings, and enteric parasites.

A specific pathogen was laboratory confirmed in 48% and epidemiologically suspected in 20% of foodborne outbreaks investigated in 2003 (Figure 4). Nine outbreaks, all bacterial, were identified by routine disease surveillance (Table 2). Laboratory testing was conducted in 15 of the 25 foodborne outbreaks (60%). Reasons for no laboratory testing include lack of cooperation (n=1) and delayed notification (n=9).

Implicated Food Vehicles: In 40% of foodborne outbreak investigations, a food vehicle was epidemiologically implicated. Implicated food vehicles are categorized in Figure 5. The largest proportion of outbreaks in which a food vehicle was identified was caused by the produce category (50%), followed by meat/poultry and multiple items (20% each). Among outbreaks in which a possible food vehicle was identified, 10% were bacterial toxin outbreaks, 60% were bacterial outbreaks, and 30% of viral outbreaks (Figure 6).

Figure 4
Foodborne Outbreaks
% with Suspected/Confirmed Etiologic Agent
LAC, 1999–2003

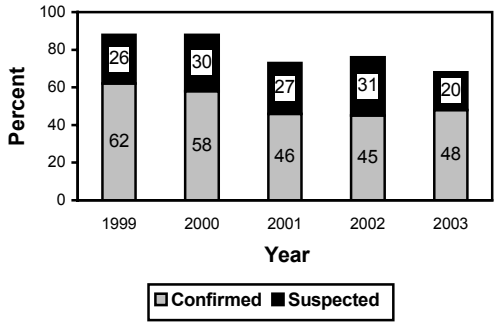


Figure 5
Foodborne Outbreaks
with Implicated Food Vehicles
LAC, 2003 (N=10)

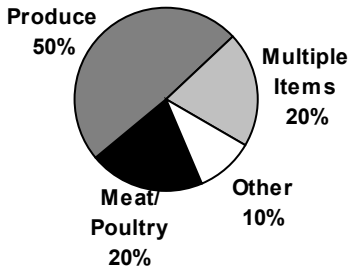
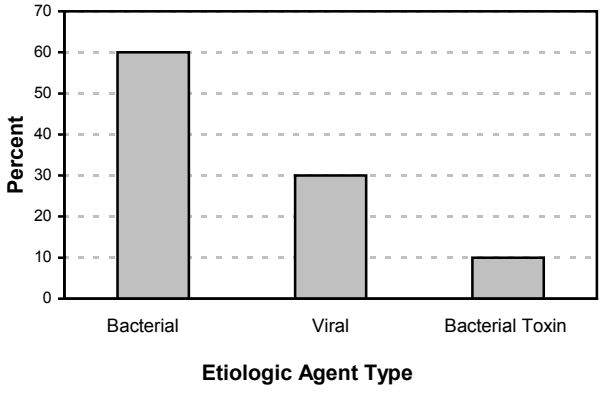
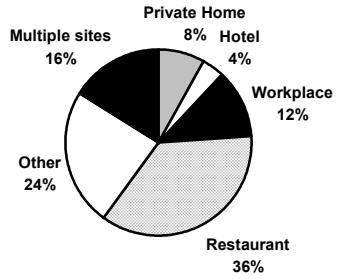


Figure 6
Percent of Foodborne Outbreaks With Food
Vehicles Implicated, by Etiologic Agent
LAC, 2003 (N=10)



Outbreak Location: The most common locations for foodborne outbreaks were restaurants (36%), followed by the workplace (12%, Figure 7). Outbreak-associated food was most often prepared by a restaurant (36%) or from a caterer (25%).

Figure 7
Foodborne Outbreaks
by Place Food Eaten
LAC, 2003

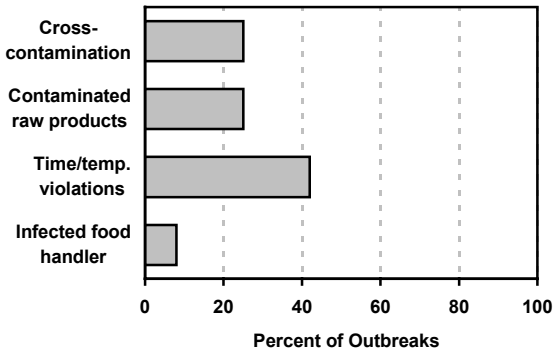


The geographic distribution of the outbreaks by SPA is summarized in Table 3. SPA 8 had the most foodborne outbreaks (n=5); SPAs 2, 3, 4 and 7 had the least (n=1). There were several multi-district and multi-county outbreaks, and one outbreak involved multiple states.

Contributing Factors: In 12 of 25 outbreak investigations, probable contributing factors of the outbreak were found on F&M inspection (Figure 8). The most frequent factors identified were improper holding time/temperature (42%), contaminated raw product and cross-contamination (25% each).

Viral GE Summary: Many of the foodborne outbreaks investigated in 2003 were categorized as viral GE (n=8, 36%). Laboratory testing was completed on two of these viral GE outbreaks, with only one testing positive for NV. Viral GE was suspected in the remaining 6 outbreaks based on symptoms, incubation period, duration of symptoms, secondary cases in households, and/or negative bacterial test results. The mean number of cases per outbreak for 2003 was 21 cases. About 67% of the viral GE outbreaks had an undetermined implicated food item, possibly due to multiple contaminated food items or person-to-person transmission. Restaurants were the most common food source for the 2003 viral GE outbreaks (44%). In 89% of the viral GE outbreaks, contributing factors were undetermined.

Figure 8
Foodborne Outbreaks with Known
Probable Contributing Factors (N=12)
LAC, 2003



COMMENTS

Since 1999, the LAC Public Health Laboratory has been testing human specimens for NV using the reverse transcription-polymerase chain reaction (RT-PCR) method. This method is still considered to be experimental and is only used to diagnose outbreaks as a whole, not for individual patients. There has been a marked increase in the number of viral GE and confirmed NV outbreaks since 1999.

PulseNet is a public health network sponsored by the CDC that uses the collaboration of laboratories and health departments at local, state, and federal levels to detect outbreaks through pulsed-field gel electrophoresis (PFGE) of pathogens. The PFGE results are monitored for matching pathogen strains of various etiologic agents. When matches are detected, an investigation may be initiated. In addition, a solitary case occurring locally can be linked to a larger, previously identified outbreak occurring on a wider geographical scale (i.e., the multistate *E. Coli* O157:H7 outbreak). LAC was involved in the investigation of 1 of these multi-jurisdictional foodborne outbreaks in 2003.

Mild symptoms, long incubation periods, and poor public and medical community awareness of public health procedures may contribute to under-reporting of foodborne disease.

Table 1. Foodborne Outbreaks in LAC, 2003 (N=25)

Agent	Subtype	Confirmed/ Suspected	Cases*	Jurisdictions
Campylobacter	unknown	Lab Confirmed	4	Torrance
E. coli O157:H7		Lab Confirmed	3	Multi-county
E. coli O157:H7		Lab Confirmed	4	Multi-county
NV		Lab Confirmed	34	Multi-district
Salmonella	newport	Lab Confirmed	2	Multi-state
Salmonella	newport	Lab Confirmed	9	Multi-district
Salmonella	oranienburg	Lab Confirmed	11	Multi-district
Salmonella	saintpaul	Lab Confirmed	7	Multi-county
Salmonella	schwarzengrund	Lab Confirmed	29	West Valley
Salmonella	schwarzengrund	Lab Confirmed	5	Harbor
Salmonella	virchow	Lab Confirmed	11	Multi-district
Vibrio	parahaemolyticus	Lab Confirmed	4	Alhambra
Bacterial toxin		Suspected	65	Foothill
Bacterial toxin		Suspected	15	Northeast
Bacterial toxin		Suspected	11	Multi-district
Bacterial toxin		Suspected	8	Bellflower
Bacterial toxin		Suspected	5	Hollywood-Wilshire
NV		Suspected	13	San Fernando
NV		Suspected	19	Harbor
NV		Suspected	13	San Fernando
NV		Suspected	32	Multi-district
NV		Suspected	15	Multi-district
NV		Suspected	20	San Antonio
NV		Suspected	10	Harbor
NV		Suspected	30	Torrance

* Includes only LAC cases.

Table 2. LAC Foodborne Outbreaks Laboratory Summary: Outbreaks by Suspect/Confirmed Etiologic Agent, 2003

	Bacterial	Bacterial Toxin	Norovirus	Unknown/Other	Total
Number of outbreaks investigated	11	5	8	1	**25**
Number of outbreaks tested	11	2	2	0	**15**
Number of outbreaks with agent confirmed	11	0	1	--	**12**
Number of outbreaks identified by routine surveillance	9	--	--	--	**9**

Table 3. Frequency of Foodborne Outbreaks by Location, 2003

SPA	Frequency	Percent
1	0	0
2	3	12
3	2	8
4	2	8
5	0	0
6	0	0
7	2	8
8	5	20
Multi-district	7	28
Multi-county	3	12
Multi-state	1	4
Total	**25**	**100**

ADDITIONAL RESOURCES

LAC resources:

- Communicable Disease Reporting System
  Hotline: (888) 397-3993
  Faxline: (888) 397-3779
- For reporting and infection control procedures consult the LAC DHS Foodborne Disease Section in the B-73 Manual – www.lapublichealth.org/acd/procs/b73/b73fh.pdf

CDC:

- Foodborne and Diarrheal Diseases Branch – www.cdc.gov/ncidod/dbmd/foodborne/index.htm
- Outbreak Response and Surveillance Unit – www.cdc.gov/ncidod/dbmd/outbreak
- FoodNet – www.cdc.gov/foodnet

Other national agencies:

- FDA Center for Food Safety and Applied Nutrition – www.vm.cfsan.fda.gov/list.html
- Gateway to Government Food Safety Information – www.FoodSafety.gov

HEALTHCARE ASSOCIATED OUTBREAKS

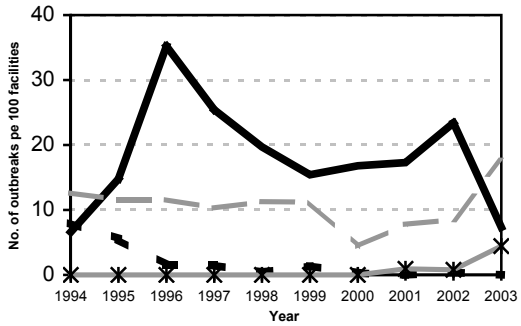
DEFINITION

Healthcare associated outbreaks are defined as clusters of nosocomial (health-facility acquired) or home-healthcare-associated infections related in time and place, or occurring above a baseline or threshold level for a facility, specific unit, or ward. Baseline is defined as what is normally observed in a particular setting.

ABSTRACT

- The rate of acute hospital outbreaks decreased to its lowest point since 1994 (Figure 1).
- In 2003, skilled nursing facility outbreaks contributed most to the increase in healthcare facility outbreaks, and increased 100% from 2002 (Table 1).

Figure 1
Healthcare Associated Outbreaks
LAC, 1994–2003



Denominator data from the Automated Certification and Licensing Administration Management System (ACLAIMS) database for LAC

Table 1. Number of Reported Outbreaks in Healthcare Facilities LAC, 1999–2003

	YEAR				
Type of Facility	**1999**	**2000**	**2001**	**2002**	**2003**
Acute Care Hospitals	18	20	19	26	8
Provider Offices	0	0	0	2	0
Dialysis Facilities	0	0	1	1	9
Intermediate Care/Psych	4	1	0	1	0
Skilled Nursing Facilities	41	19	35	37	75
TOTAL	**63**	**40**	**55**	**67**	**92**

Acute Care Hospitals: There were 8 outbreaks reported in acute care hospitals in 2003 (Table 1)—a decrease of 69% from 2002. Half occurred in intensive care units and half in medical or surgical units (Table 2). Half were of bacterial, with the remainder of viral or ectoparasitic etiology (Table 3). Four hospitals reported more than one outbreak. In 2003, the etiologic agents contributing the largest number of cases in acute care outbreaks were scabies (n=44) and norovirus (n=25).

Table 2. Acute Care Outbreaks by Hospital Unit—LAC, 2003

Outbreak Location	**No. of Outbreaks**
Neonatal Intensive Care	3
Multiple Units	2
Cardiac Surgery	1
Adult Intensive Care	1
Medical	1
Total	**8**

Table 3. Acute Care Hospital Outbreaks by Disease/Condition—LAC, 2003		
Disease/Condition/ Etiologic Agent	**No. of Outbreaks**	**No. of Cases**
Scabies	2	44
MRSA	2	6
Acinetobacter baumannii	1	7
Enterobacter aerogenes	1	5
Respiratory Syncytial Virus	1	7
Norovirus	1	25
TOTAL	**8**	**94**

Sub-acute Facilities: In 2003, 75 outbreaks were reported in skilled nursing facilities (SNF). Gastroenteritis and scabies were the most common causes (Table 4). Gastroenteritis, norovirus, and unspecified gastroenteritis combined accounted for 55% (n=41) of outbreaks and 1043 cases in sub-acute care settings. Scabies outbreaks (n=27), among the most frequently reported cause of outbreaks, accounted for 36% of outbreaks. One outbreak was associated with a crusted scabies source case. There were nine outbreaks of mixed organism bacteremias in dialysis facilities (Table 1). All of these facilities were part of the same nation-wide dialysis provider network (see Special Reports).

Table 4. Sub-Acute Care Outbreaks by Disease/Condition LAC, 2003		
Disease/Condition	**No. of Outbreaks**	**No. of Cases**
Gastroenteritis • unspecified (n=9) • norovirus (n=32)	41	1,043
Scabies (typical)	27	193
Respiratory illness • influenza (n=3) • unspecified (n=1)	4	57
Illness, unspecified	1	13
Pneumococcal Disease	1	14
Ringworm	1	4
Total	**75**	**1,324**

COMMENTS

Outbreaks in healthcare facilities are investigated by LAC DHS, long-term care facilities by the district public health nurse, and acute care hospitals by ACDC in collaboration with the infection control professional. Cooperative investigations occasionally occur. The extent of health department involvement varies depending on several factors such as the clinical significance of the disease or organism, the facilities' resources, the associated morbidity/mortality, and the potential for involvement with other jurisdictions, agencies or entities.

To assist healthcare facilities and district staff, ACDC develops and publishes guidelines for management of clinically significant diseases of concern in LAC, such as scabies and antimicrobial resistant microorganisms (ARM). Developing strategies to prevent and control the emergence and spread of ARMs remains a priority. ACDC continues to collaborate with health facilities and community-based organizations to educate providers and consumers and to promote appropriate use of antimicrobials and

management of ARMs. See Special Reports for more information about ARMs and appropriate use of antibiotics/antimicrobials.

In 2003, as part of outreach to the hospital community, a liaison public health nurse (LPHN) program was initiated to improve communicable disease reporting and enhance communication between ACDC and acute care facilities in LAC.

ADDITIONAL INFORMATION

Useful information is available from the CDC including:

- Outbreak management – www.cdc.gov/ncidod/hip/OUTBREAK/outbreak.htm
- Hand hygiene in healthcare settings – www.cdc.gov/handhygiene/default.htm
- Sterilization and disinfection – www.cdc.gov/ncidod/hip/STERILE/Sterile.htm

Publications:

- CDC. Guidelines for environmental infection control in healthcare facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC), 2003; MMWR 52(RR10); 1–42. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm
- Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for prevention of surgical site infection, 1999; Infection Control and Hospital Epidemiology 20(4); 247–78. Available at: www.cdc.gov/ncidod/hip/SSI/SSI.pdf

SPECIAL DISEASE SUMMARIES

2003

BOTULISM SUMMARY
LOS ANGELES COUNTY, 2003

No confirmed cases of botulism were reported among LAC residents during 2003, although 11 suspected cases were investigated in depth (see table below). Most reported cases were male (n=7), most were Hispanic (n=6), and ages ranged from 19 to 73 years (mean 48.6). Five suspected cases were injection drug users (IDU). Five suspected cases occurred in summer, while no cases were reported in winter. After investigation, the following dispositions were made. Three were diagnosed clinically as cases of wound botulism and one as foodborne botulism; seven received an alternative diagnosis -- four of these were diagnosed with Guillain-Barré syndrome (GBS) including one case of GBS Miller-Fischer variant, and three cases were diagnosed with other central nervous system diseases. This report excludes cases of infant botulism, which is monitored by the State Department of Health Services.

CASE REPORTS

Suspected Wound Botulism (n=3): These cases were diagnosed clinically with wound botulism but all their tests -- i.e. serum, stool, wound and/or gastric aspirate -- were negative for botulinum toxin or *Clostridium botulinum* organisms. All three cases were Hispanic males ranging in age from 43 to 46; they presented with classic descending motor paralysis and all injected drugs. None was treated with botulinum antitoxin because of delayed reporting ranging from 5 to 14 days after admission and clinical stability.

Suspected Foodborne Botulism (n=1): The only case was a 42 year old Hispanic male with no risk factors for wound botulism, whose illness was clinically consistent with botulism. He received botulinum antitoxin; tests on serum, gastric aspirate, and food (canned beans) were negative for botulinum toxin and organisms.

Guillain-Barré Syndrome (n=4): Four suspected botulism cases received a final diagnosis of GBS or GBS Miller-Fischer variant. Two cases were female; three were Hispanic and the other Asian. Their mean age was 42 (range 19-62). Only one case received antitoxin treatment. Tests of stool and serum from three cases were negative. Two patients used injected drugs; one had a negative wound culture and serum toxin screen, while no tests were performed on the second IDU. Stool cultures of the two non-IDU cases were positive for campylobacter species, a frequent predecessor of GBS.

Central Nervous System Disease (n=3): Three suspected cases of botulism were found to have a disorder of the central nervous system; botulism tests were not performed on any of these three because their clinical presentations suggested another diagnosis. The first case was a 73-year old Asian male who developed quadriplegia; repeated imaging tests disclosed a brain stem infarct not seen during initial testing. The next case was a 73-year old woman first suspected of having GBS-MFV and who received botulinum antitoxin; her final diagnosis was paraneoplastic cerebellitis. The third case was a 47-year old woman ultimately diagnosed with an unspecified tumor in the brain stem.

COMMENTS

Since botulinum toxin testing with the mouse bio-assay is available only in the DHS Public Health Laboratory (PHL), most initial reports are made by hospital laboratorians seeking permission to submit specimens to the PHL. ACDC then contacts the treating physician for further details.

Frequently the patient suffers with mild symptoms for several days before seeking medical treatment. The average delay from hospital admission to consultation with ACDC was 5 days (range 2-14), but for injection drug users it was slightly longer, averaging 6.5 days (range 3-14). In such situations other diagnoses have been ruled out and only botulism remains in the differential, prompting the request for testing. It is also possible for wound botulism to develop in a patient previously hospitalized for other

reasons, such as detoxification or withdrawal; that was not the case with any of the suspected cases occurring in 2003—all had neurological complaints and findings on admission.

Botulism is one of seven biological agents classified as "Category A" for bioterrorism preparedness, requiring the highest priority for reporting. Heightened concern over bioterrorism should lead to increased consultations with Public Health for possible botulism cases. Prompter reporting of suspected botulism cases will achieve two important goals. First, the rate of confirmation should increase as specimens are obtained sooner when toxin levels are higher and cultures are obtained prior to antibiotic administration. Second, should botulism toxin ever be used as a terrorist's tool, rapid case reporting will permit faster recognition of the problem and increase the likelihood of determining the source.

Table 1. Suspected Botulism Cases, LAC DHS, 2003

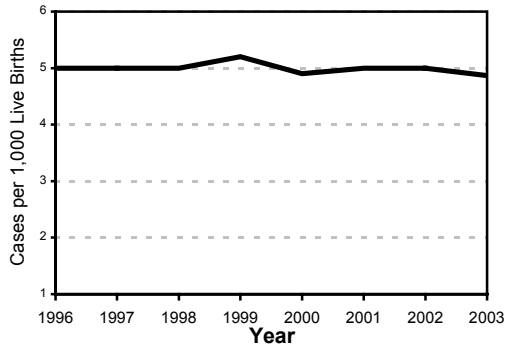
Age/ Sex	Race/ Ethnicity	Month of onset	Injection drug user	Serum test*	Stool test¶	Other test – Result&	Anti-toxin	Diagnosis
47 F	Unk	March	No	--	--	--	No	Neoplasm
73 M	Asian non-Hispanic	May	No	--	--	--	No	Cerebral infarct
73 F	White non-Hispanic	May	No	--	--	--	Yes	Paraneo-plastic cerebellitis
62 F	White Hispanic	July	No	Neg	Neg	Stool – campylobacter	No	GBS
37 F	White Hispanic	August	Yes	--	--	--	No	GBS-MFV
49 M	White Hispanic	August	Yes	Neg	--	Wound aspirate – Neg	Yes	GBS
46 M	White Hispanic	August	Yes	QNS	Neg	Wound aspirate – Neg Wound biopsy – Neg	No	Wound botulism
19 M	Asian non-Hispanic	September	No	Neg	Neg	Stool – campylobacter	No	GBS
44 M	White Hispanic	October	Yes	Neg	Neg	--	No	Wound botulism
42 M	White Hispanic	October	No	Neg	QNS	Gastric Aspirate – Neg Food – Neg	Yes	Foodborne botulism
43 M	White non-Hispanic	November	Yes	Neg	Neg	--	No	Wound botulism

Neg – test was performed and result was negative
QNS – quantity not sufficient
GBS – Guillain-Barré syndrome
MFV – Miller-Fischer variant of GBS
* Botulinum toxin screen by mouse bio-assay
¶ Botulinum toxin screen by mouse bio-assay; culture for clostridia
& Culture for clostridia (wound material, gastric aspirate, food item) or enteric bacteria (stool); botulinum toxin screen (gastric aspirate, wound aspirate)

HEPATITIS B, PERINATAL

CRUDE DATA	
Number of Infants Born to HbsAg Positive Mothers	693
Annual Prevalence[a]	
LA County	5
United States	N/A
Age at Diagnosis	
Mean	N/A
Median	N/A
Range	N/A
Case Fatality	
LA County	0.0%
United States	N/A

Figure 1
Perinatal Hepatitis B
Incidence Rates of Infants Born to
HBV-Positive Mothers by Year
LAC, 1996–2003*



[a] Cases per 1,000 live births.

DESCRIPTION

Hepatitis B is a vaccine-preventable disease transmitted through parenteral or mucous membrane exposure to the blood and other body fluids of individuals infected with the hepatitis B virus (HBV). It is also transmitted from mother to infant during birth. Within LAC, it is estimated that over 40% of infants born to hepatitis B surface antigen (HBsAg) positive women will become infected without prophylaxis. An estimated 90% of infants who become infected by perinatal transmission develop chronic HBV infection and up to 25% will die of chronic liver disease as adults. Hepatitis B vaccination and one dose of hepatitis B immune globulin (HBIG), administered within 24 hours after birth, are 85–95% effective in preventing both HBV infection and the chronic carrier state. Post-vaccination serologic testing is recommended 3–9 months after completing immunoprophylaxis to verify vaccine success or failure. The Immunization Program's Perinatal Hepatitis B Prevention Program (PHBPP) conducts case management of chronic HBsAg-positive pregnant women, their newborns, and household contacts.

DISEASE ABSTRACT

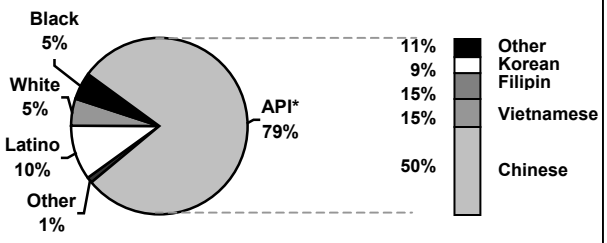
- The majority of HBsAg-positive women giving birth were born in areas of the world with high or intermediate levels of endemic hepatitis B disease (e.g., Southeast and Central Asia).
- Of infants born to HBsAg-positive mothers, 96% were immunized within 24 hours of birth.
- Among those whose pediatric health care providers responded to a survey after the completion of the full vaccination series, 91% of infants were protected against HBV, 7% were still susceptible, and 2% were infected with HBV.

STRATIFIED DATA

Trends: In 2003, 693 infants (including 8 sets of twins) were born to 685 HBsAg-positive women. The incidence of infants born to HBsAg-positive mothers was essentially unchanged from 2002 (Figure 1).

Race/Ethnicity: The majority of the cases were among Asian/Pacific Islanders (API). Five hundred thirty-eight (79%) of the women were API, 70 (10%) were Latino, 37(5%) were Black, 33 (5%) were White, and 7 (1%) were classified by another ("other") ethnic group (Figure 2). Of API women, half were Chinese (n=271, 50%). The remaining API women included: Vietnamese (n=81, 15%), Filipino (n=80, 15%), Korean (n=47, 9%), and others (e.g., Samoa, Tonga, Japan, Laos, Burma, Indonesia, and Malaysia; n=59, 11%).

Figure 2
Perinatal Hepatitis B
by Maternal Race/Ethnicity
LAC, 2003 (N=685)



* Includes Asians and Pacific Islanders

Age: The age-range of mothers was 16–47 years of age with a median age of 31 years.

Location: The majority of the HBsAg-positive mothers (n=280, 41%) resided in SPA 3, which has a large Asian/Pacific Islander constituency. An additional 16% resided in SPA 4 (n=114), followed by SPA 2 (n=87, 13%), SPA 8 (n=65, 9%), SPA 7 (n=61, 9%), SPA 5 (n=31, 5%), SPA 6 (n=31, 5%), and SPA 1 (n=16, 2%).

Countries of Origin: The majority (n=607, 89%) of the HBsAg-positive women giving birth were born outside of the US. Of these women, 561 (92%) were born in areas of the world with high or intermediate levels of endemic hepatitis B disease, such as Southeast Asia, Central Asia, India, the Middle East, Africa, Eastern Europe, South Pacific Islands, and several Central and South America countries.

CASES COMPLETED FOR FOLLOW-UP IN 2003

In 2003, follow-up was completed for 742 women, their 751 newborns, and 1,267 household contacts. One hundred-seven mothers were excluded (77 mothers miscarried, terminated or had fetal demise, 17 transferred/moved out of LAC or were unable to be located before delivery and 13 were retested and found to be HBsAg negative). Case managers made numerous attempts to complete follow up of infants and household contacts; therefore, some of the cases completed in 2003 were reported in 2001 and 2002.

Case management protocol includes:

1. educating pregnant HBsAg-positive women about HBV disease and transmission,
2. identifying and referring household contacts for screening and vaccination,
3. notifying hospitals of the expected deliveries and requesting that the hospitals return documentation after the infant's birth with the dates and times of the administration of hepatitis B vaccine #1 and HBIG,
4. notifying the infant's health care provider about the need for hepatitis B vaccine #2 at 1 to 2 months and hepatitis B vaccine #3 at six months of age,
5. reminding parents about these needed vaccinations, and
6. sending post vaccination serology letters to pediatric health care providers.

Infant Immunoprophylaxis Completion Rates: Of 751eligible infants (including 8 sets of twins), nearly all (96%) received the hepatitis B vaccine #1 and HBIG within 24 hours of birth. The majority of infants (n=693, 92%) received HBIG and a complete three-dose series of hepatitis B vaccine (Table 1).

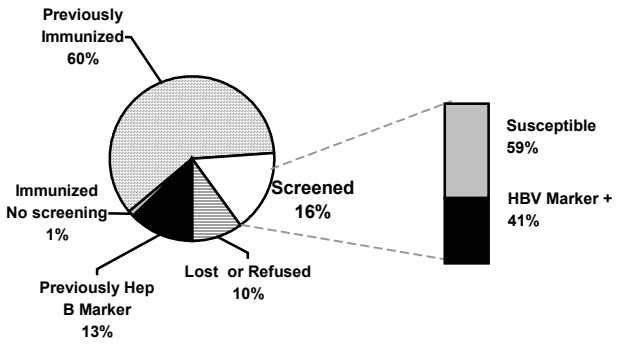
Table 1. Summary of Infant Hepatitis B Immunoprophylaxis, LAC—2003 (N=751)

Hepatitis B Immunoprophylaxis	# of Infants	Percent*
Received hepatitis B vaccine #1 <12 hours after birth	706	94%
Received hepatitis B vaccine #1 <24 hours after birth	724	96%
Received HBIG <12 hours after birth	702	94%
Received HBIG <24 hours after birth	720	96%
Completed HBIG/3-dose hepatitis B vaccine series	693	92%

* Percent of infants receiving hepatitis B immunoprophylaxis out of 751 infants born to 742 HBsAg+ mothers who completed follow-up in 2003. Total includes infants who moved out of LAC prior to 6 months of age and prior to completion of the 3-dose hepatitis B vaccine.

Household and Sexual Contacts Completion Rates: A household contact was defined as an individual with anticipated continuous household exposure for greater than one year (often limited to nuclear family). Of 1,267 household and sexual contacts identified, 757 (60%) had already been vaccinated against hepatitis B, and 167 (13%) were known to have serologic evidence of hepatitis B infection. Of the remaining 343 (27%) contacts, 207 (16%) were screened for serologic evidence of hepatitis B infection or immunity, while 132 (10%) refused screening or vaccination, were lost to follow-up, or moved; 1% were vaccinated without screening. Of the 207 (16%) household contacts that were serologically screened, 85 (41%) had positive markers for hepatitis B and therefore did not need vaccine. Over half of the screened household contacts (n=122, 59%) were seronegative, and therefore, susceptible to hepatitis B infection (Figure 3). At the time of completion of case management for the HBsAg-positive mothers, 103 (84%) of these susceptible household contacts had completed all three doses of hepatitis B vaccine.

Figure 3
HBV Marker Status Of Household Contacts
to Cases Closed in 2003
LAC (N=1,267)



Post-vaccination serology results: Post vaccination serology testing of infants born to HBsAg-positive mothers is recommended 3 to 9 months after completing immunoprophylaxis to verify vaccine failure or success. Letters requesting post vaccination serology results were mailed to pediatric health care providers of infants tracked by the PHBPP. The post vaccination serology results of 375 infants (50%) whose follow-up was completed in 2003 were received. Of these, 342 (91%) had antibodies to hepatitis B surface antigen indicating protection against HBV, 7 (2%) were HBsAg-positive and infected, and 26 (7%) were negative for both markers and revaccination was recommended.

ADDITIONAL RESOURCES

Additional information is available from the CDC:

- General information – www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm
- Publications – www.cdc.gov/ncidod/diseases/hepatitis/resource/pubs.htm
- Viral Hepatitis B Virus slide set – www.cdc.gov/ncidod/diseases/hepatitis/slideset/hep_b/slide_1.htm

Information from Hepatitis organizations include:

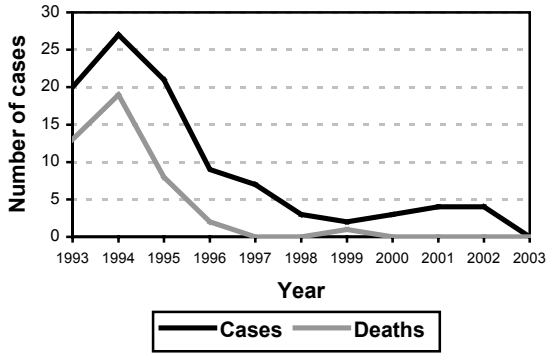
- Immunization Action Coalition – www.immunize.org
- Hepatitis B Foundation – www.hepb.org

PEDIATRIC HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION and ACQUIRED IMMUNODEFICIENCY SYDROME (AIDS)

CRUDE DATA	
Number of Cases*	14
Annual Incidence[a]	
LA County	0.2[b]
California	0.2
United States	N/A
Case Fatality	
LA County	61%
United States	N/A

* Includes both HIV and AIDS cases reported in 2003.
[a] Cases per 100,000 population.
[b] Rates based on less than 20 observations are unreliable.

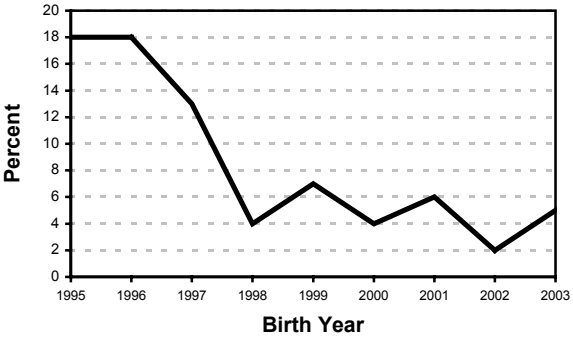
Figure 1
Pediatric AIDS Cases and Deaths
LAC, 1993–2003



DESCRIPTION

The spread of the HIV/AIDS epidemic to children has become one of the most serious public health problems in the US. The natural history of perinatal HIV disease in children less than 13 years of age differs from adults in that there is rapid progression of the disease in children as measured by age at AIDS diagnosis and an overall shorter survival. HIV, the virus that causes AIDS, can be transmitted from an infected mother to her newborn child at any one of three stages: antepartum (during pregnancy), intrapartum (during birth-labor or delivery) and postpartum, through breast-feeding. A woman who has HIV and is pregnant can help decrease the risk of transmitting HIV from 20% to 8% or less if antiretroviral therapy like ZDV (zidovudine, Retrovir) is used during pregnancy and at time of delivery.

Figure 2
Pediatric HIV/AIDS
Rates of Perinatal HIV Transmission by BirthYear
LAC, 1995–2003



Transmission rates can be further reduced to less than 2% with the use of perinatal HAART (highly active anti-retroviral therapy). Transmission rates are lowest if the newborn takes ZDV post-exposure prophylaxis for six weeks after birth

DISEASE ABSTRACT

- Perinatal transmission of HIV accounts for 91% of all pediatric AIDS cases in the US and almost all new HIV infections in children.
- Perinatal HIV transmission rates for all babies born in LAC were at 2% in 2002 but increased to 5% in 2003 (Figure 2).

- Ninety-two percent of the transmissions from 1999–2003 were missed opportunities for prevention due primarily to no prenatal care, or failure to identify and treat the mother prenatally for HIV.
- LAC has the highest burden of perinatal HIV transmission in CA and accounts for over 80% of all HIV infected children reported to the state.
- The number of reported pediatric HIV/AIDS cases in LAC has fallen sharply over the years, after a peak of 32 pediatric HIV infections reported in 1998. Fourteen cases of pediatric HIV cases were reported in 2003, similar to the previous year (Figure3).

Figure 3
Pediatric HIV/AIDS
Number of Cases Reported by Year
LAC, 1998–2003

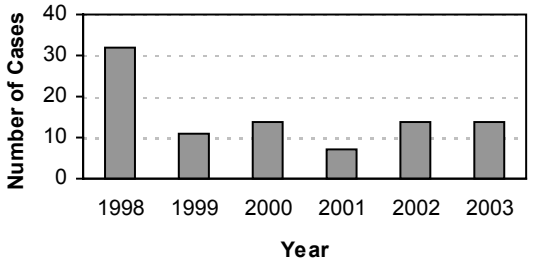


Table 1: Description of Pediatric HIV Cases Born in 2003, LAC

	Case 1	Case 2	Case 3	Case 4	Case 5
Place of birth	USA	USA	USA	USA	USA
Gender	Female	Male	Female	Male	Female
Race/ethnicity	Latino	Latino	Black	Black	White
Prenatal Care Received	No	No	Yes	No	No
Date mother was diagnosed with HIV	Before child's birth	Before child's birth	Before child's birth	After child's birth	After child's birth
Mode of delivery	Cesarean section	Vaginal	Cesarean section	Unknown	Cesarean section
Mother received zidovudine (ZDV) at labor and delivery	Yes	Yes	Yes	No	No
Breastfed	No	No	No	No	Unknown

COMMENTS

- The risk of perinatal HIV transmission can be maximally reduced by early prenatal care, screening of all pregnant women for HIV, and if found positive, appropriate treatment of mother and child, cesarean delivery and not breast-feeding.
- Despite major successes in reducing mother-to-child transmission of HIV infection both nationwide and locally, new cases of pediatric HIV are still being identified.
- Women who are most at risk to deliver a baby infected with HIV are those who do not receive prenatal care. Among others, they include those who are drug addicts, incarcerated, non-English speaking, undocumented immigrants, uninsured, homeless and teens.
- The standard HIV serological tests, including enzyme linked immunosorbent assay (ELISA) and Western blot immunoassay, are not useful in the diagnosis of HIV infection during infancy because of the confounding presence in infants' blood of transplacentally derived maternal antibody.
- In the U.S., the HIV DNA polymerese chain reaction (PCR) assay is the most widely used test for diagnosis of HIV infection during infancy.

- For the purposes of clinical decision making, an infant greater than 18 months of age is considered HIV-infected if he/she is known to be HIV-seropositive, or was born to an HIV-infected mother, and has positive results on two separate direct tests for HIV (i.e., HIV culture, PCR, or p24 antigen detection in a child ≥ 1 month of age).
- The OraQuick® rapid HIV-1 antibody test recently approved by the federal government can provide reliable results within 20 minutes compared to the current products that can take days to process.

ADDITIONAL RESOURCES

For information about the reporting of HIV and AIDS cases in LAC see:
www.lapublichealth.org/hiv/hivreporting.htm

Pediatric HIV publications:

- CDC. Public Health Service Task Force recommendations for the use of antiretroviral drugs in pregnant women infected with HIV-1 for maternal health and for reducing perinatal HIV-1 transmission in the United States. MMWR 1998; 47:1–30. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00053202.htm

- Mofenson, LM, Committee on Pediatric AIDS. Technical report: Perinatal human immunodeficiency virus testing and prevention of transmission. Pediatrics 2000; 106:1–12. Available at: www.pediatrics.aappublications.org/cgi/reprint/106/6/e88.pdf

- CDC. Guidelines for national human immunodeficiency virus case surveillance, including monitoring for human immunodeficiency virus infection and acquired immunodeficiency syndrome. MMWR 1999; 48:1–28. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr4813a1.htm

- CDC. HIV/AIDS Surveillance Report : Cases of HIV infection and AIDS in the United States, 2002. 2003; 14:1-48. Available at: www.cdc.gov/hiv/stats/hasr1402/2002SurveillanceReport.pdf

- CDC. Success in Implementing Public Health Service Guidelines to Reduce Perinatal Transmission of HIV—Louisiana, Michigan, New Jersey, and South Carolina, 1993, 1995, and 1996. MMWR 1998; 47:688–691. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00054649.htm

PEDIATRIC HIV DISEASE
PEDIATRIC SPECTRUM OF DISEASE (PSD)

In March 1988, the Pediatric Spectrum of Disease (PSD) project of LAC DHS began conducting active surveillance for children HIV-exposed and infected under the age of 13 years as part of the CDC national PSD research project. Case ascertainment included all children who had died with an AIDS or HIV diagnosis and all who were still alive and in medical care.

The PSD project followed all reported HIV-exposed and infected children prospectively collecting information at baseline when the child was initially evaluated for HIV and then every 6 months for the life of the infected child and for 2 years for the uninfected children. Children who reached adolescence were followed until they transferred to an adult AIDS clinic. As of December 31, 2003, with active case ascertainment at the 10 major LAC pediatric referral centers, a total of 2,008 HIV exposed and infected children had been reported to LAC PSD. This number includes 1,772 LAC resident children and 236 nonresident children receiving care in LAC (including those who had died). Excluding those who have died or are lost to follow-up, 285 HIV-infected children and adolescents and 23 children of indeterminate status were under HIV care in LAC as of December 31, 2003.

CDC CLASSIFICATION

HIV-exposed and infected children less than 13 years of age were classified using the CDC's pediatric classification criteria.1 Children less than 18 months of age who may still be carrying maternal antibody for HIV, and do not have conclusive laboratory information to classify them, were of indeterminate status. Those who lost maternal antibody and had no evidence of HIV infection were classified as uninfected. Children who reached 13 years of age without a pediatric AIDS diagnosis were classified as AIDS when they met the adult classification criteria.2

In 2003, 139 HIV-exposed and infected children were reported to PSD of whom 2% had an AIDS diagnosis, 14% were infected but without AIDS, 18% were of indeterminate status, and 66% were uninfected. Of the 22 infected children reported in 2003, 15 (68%) were identified after birth including 11 after 2 years of age. Seven were non-LAC residents at the time of their HIV diagnosis.

Of the total 2,008 children reported cumulatively to LAC PSD, 638 were HIV-infected (including 374 AIDS cases), 1,279 were perinatally HIV-exposed but uninfected, and 91 were of indeterminate HIV status because they were still too young to diagnose or were lost to follow-up before they could be definitively classified. The proportion of infected children reported to PSD has decreased from 40% of the total children reported in 1990–1991 to 15% in 2002–2003 (Figure 1).

Of the 638 cumulatively reported HIV-infected children, 294 or 46% had an AIDS-defining condition before 13 years of age and met the pediatric CDC AIDS classification criteria. Another 80 were diagnosed with adult AIDS at 13 years of age or older including 67 who met the CD4 criteria and 13 who met the clinical criteria.

MODE OF TRANSMISSION

In 2003, all but two of the 139 HIV-exposed and infected children reported had perinatally acquired (PA) infection from an HIV-infected mother: One is a suspect PA case and the other is from a foreign country where the mode of transmission was nonsterilized medical injection needles. Among the HIV-infected and

1 CDC. Appendix: Revised Surveillance Case Definition for HIV Infection. MMWR 1999; 4(RR-13);29-31. In order to classify as many children as possible into the infected or uninfected categories, the national and local PSD project added a "Reviewed Uninfected" classification which used the following criteria: No positive HIV culture, HIV DNA, HIV RNA, or HIV p24 antigen ever; at least 2 negative DNA PCR tests; and at least 1 negative DNA PCR over 8 weeks of age (56 days).

2 CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992; 41(no. RR-17).

indeterminate children and adolescents reported cumulatively (n=729), 550 (75%) were PA infection, 126 children (17%) were infected from a contaminated blood transfusion, and 39 (5%) were children with hemophilia or a coagulation disorder. Two children were infected due to breastfeeding. Among the PA group, 22% had a mother who was an injection drug user (IDU), 11% had a mother who had sex with an IDU, 26% had a mother who had sex with an HIV+ or high-risk male, 3% had a mother infected through a blood transfusion, and 38% had a mother whose risk factor for HIV infection could not be identified. Sexual abuse is suspected as a risk factor for four children and confirmed for one child.

The proportion of perinatally exposed children whose mother's risk factor for HIV was IDU has decreased from 29% in 1990–1991 to 6% in 2002–2003 (Figure 2). Correspondingly, the number of children infected due to an HIV-infected mother with unknown risk has increased each year from 35% in 1990–1991 to 51% in 2002–2003.

Figure 1
CDC Classification and Year of Child's Enrollment
PSD, December 2003 (N=2,008)

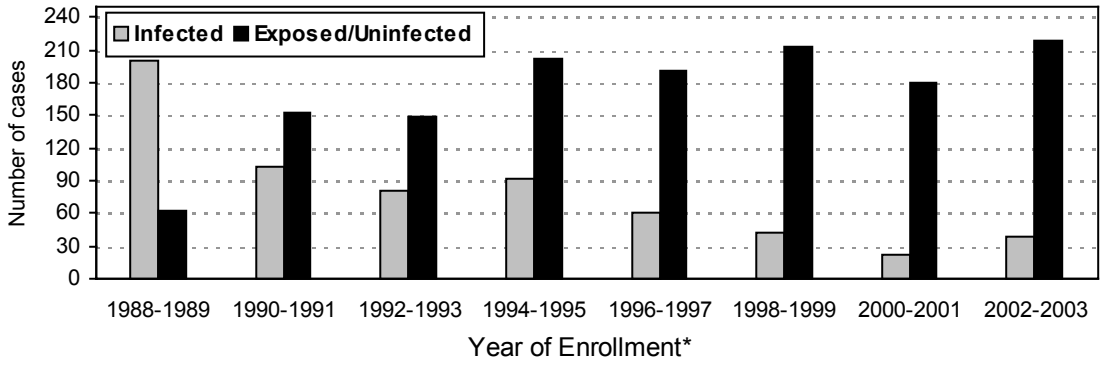
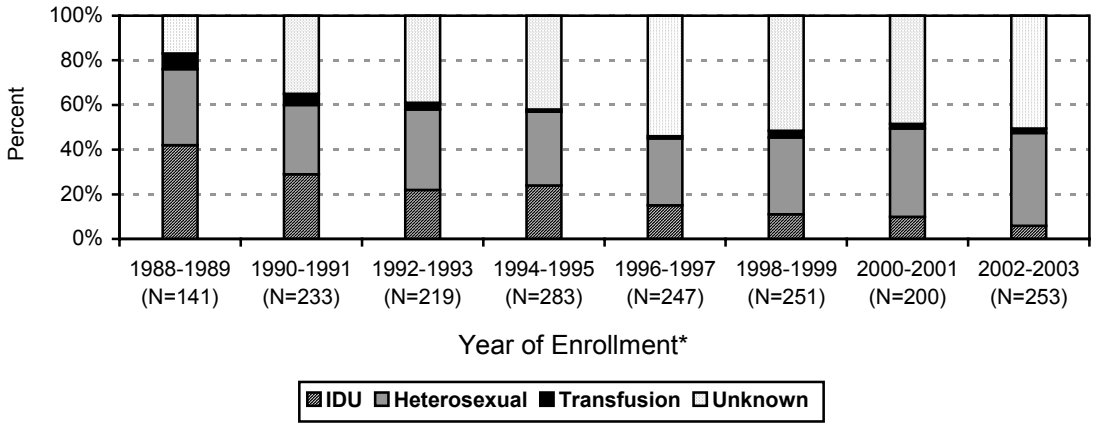


Figure 2
Maternal HIV Risk of Children with Perinatally Acquired HIV Exposure
by Year of Child's Enrollment
PSD, December 2003 (N=1,827)



DEMOGRAPHICS

Of the 139 HIV-exposed and infected children reported in 2003, 49% were Black, 33% Hispanic, and 12% White. Among the HIV-infected and indeterminate children and adolescents reported cumulatively (n=792), 34% were Black, 42% Hispanic, 20% White, 3% Asian, and 1% other/unknown. The transfusion-associated and hemophiliac cases were more likely to be White (36%) than the PA group (14%).

Of the 139 HIV-exposed and infected children reported in 2003, 54% were male and 46% were female. Cumulatively, the distribution of HIV-infected and indeterminate children by gender shows slightly more males than females (51% vs. 49%) due to the disproportionate number of transfusion-associated and hemophiliac cases among males.

In 2003, 124 (89%) enrolled children had data on primary caretaker: 81% had a biologic parent as their primary caretaker, 13% were in foster care, 2% adopted, and 5% were in other living arrangements. Cumulatively, 69% of the infected and indeterminate children and adolescents had a biologic parent as their primary caretaker at the latest medical contact: 18% lived with another relative or were in foster care, 6% with adoptive parents, and 6% in other or unknown living arrangements. The PA group was more likely to be living in foster care or with another relative than the transfused and hemophiliacs (23% vs. 4%, and 3% respectively). Within the PA group, Hispanics were the least likely to be in foster care, living with another relative or adopted (24% vs. 38% for Blacks and 32% for Whites).

CASE FATALITY AND SURVIVAL

The cumulative fatality rate for AIDS cases was 55% (207 of 374). Sixteen or 5% of the children not meeting the AIDS case definition have died. The mean age at AIDS diagnosis for the PA cases was 45 months (median 19 months) compared to the mean age at AIDS diagnosis of 99 months for the transfused cases (median 112 months), and 165 months for the hemophiliacs (median 167 months). With improved treatments including combinations of drugs and highly active antiretroviral therapy (HAART), the mean age at AIDS diagnosis has increased from 38 months in 1990 to 91 months in 1995 and 104 months in 2000.

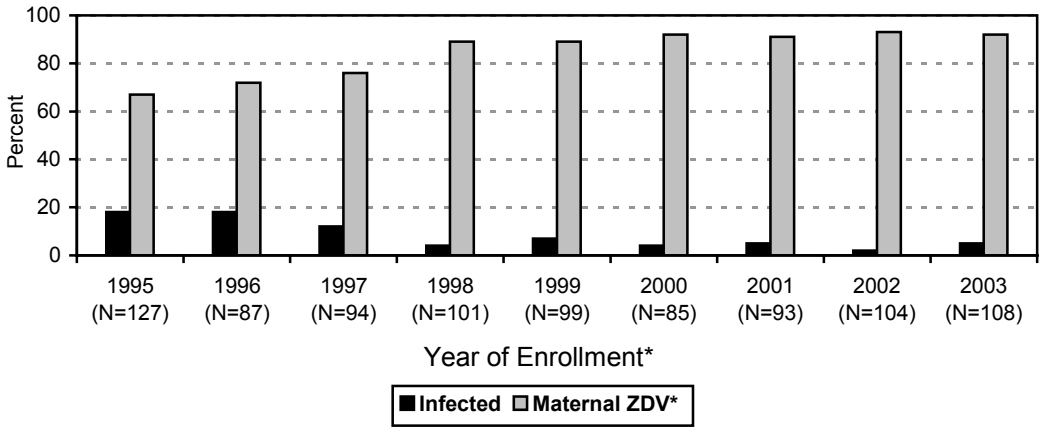
Among the 308 HIV-infected and indeterminate children and adolescents still alive and followed by PSD, 10% (including those indeterminate children still too young to be diagnosed) were less than 2 years of age, 16% were between 2–7 years, 35% were 8–12 years, and 39% were 13 years or greater. Among the 285 HIV-infected children and adolescents still alive and followed by PSD, 94% were receiving HAART at their last medical contact.

PRENATAL ZDV AND PERINATAL TRANSMISSION

Beginning in 1994, zidovudine (ZDV) use during pregnancy, labor, and delivery became a recognized means to prevent perinatal HIV transmission. In recent years, HAART has been prescribed during pregnancy and further reductions in the risk of perinatal HIV transmission have been observed. Of the 982 infants born in 1995–2003 to HIV-infected women and reported to PSD, 761 (77%) of their mothers received antiretroviral therapy during pregnancy; 89% received prenatal care; 767 (78%) received ZDV during labor and delivery. In 2003, 82% received prenatal care, 91% received antiretrovirals either during pregnancy or labor and delivery, and 82% of the mothers received both. The C-section rate among children reported to PSD has increased from 20-30% before 1999 to 52% in 2003.

The overall rate of perinatal transmission for all children born in 1995–2003 and reported in 2003 (including those who received no treatment) was 10% compared to the 20–25% transmission rate expected before 1994 when ZDV was shown to prevent perinatal transmission. For children born in LAC, perinatal HIV transmission rates have declined from 18% in 1995 to 5% in 2003 as the use of antiretrovirals during pregnancy and/or labor and delivery increased from 67% in 1995 to 92% in 2003 (Figure 3).

Figure 3
Rates of Perinatal HIV Transmission and Maternal Zidovudine (ZDV) Use
for Reported Babies Born in LAC
PSD, 1995-2003



ROUTINE PRENATAL HIV TESTING

As of January 1, 2004, all prenatal providers were legally required make the HIV test a part of the routine battery of prenatal tests.3 This new law replaces the previous mandate that required providers to offer HIV-counseling and voluntary HIV testing to their prenatal patients. Under the new law, the woman must still sign a consent form and has the right to refuse the test. However, the new law makes it easier for prenatal care providers to encourage all of their patients to accept the test as a part of routine prenatal care. In addition, the test results must be kept in medical chart so that when a woman delivers, the labor and delivery staff can request the test for those with no prenatal documentation. Again, the woman must give written consent and has the right to refuse. There are now rapid tests available and protocols for conducting rapid testing during labor and delivery so that prophylaxis to prevent perinatal transmission can begin at labor and delivery.4

Statistics from one health center that reports directly to Acute Communicable Disease Control (ACDC) showed a 77% acceptance rate for HIV testing in 2003 with monthly variations ranging from 61% to 90%. These rates represented test acceptance under the old law. No HIV-positive women were identified in 2003. Eighty-two women since 1989 have been identified in LAC clinics; 58 (71%) reported risk assessment information to ACDC. Thirty (52%) of these women could not identify any known risk factor for HIV infection. Women identified as HIV positive are referred to tertiary care centers to receive specialized care for themselves and their unborn infants.

3 California Health and Safety Code Sections 125085, 125090, 125105, 125107.
4 www.cdc.gov/hiv/projects/perinatal/guidelines.htm

LOS ANGELES COUNTY INFLUENZA SUMMARY, 2003–2004: IN LIKE A LION, OUT LIKE A LAMB

While numerous years of surveillance have identified some common influenza trends (i.e., the general time of onset and peak), these trends are not absolute—even core aspects can change in a given year, as was evident during and the 2003–2004 season. Both locally and nationwide, the season peaked several weeks earlier than expected. But even more surprising and unusual was how widespread and simultaneously activity peaked; instead of peaking sporadically across the nation, nearly all states reported their peak activity at about the same, and again, earlier in the season than expected.

Similarly, despite numerous years of public health education and vaccination campaigns, the public's reaction to each influenza season is also unpredictable. During most years, the public, as a whole, is apathetic, and considerable effort is required to encourage vaccination—but then in other years, demand and concern soars. Mirroring the quick and widespread peak in influenza activity during the 2003–2004 season, the public's reaction also underwent an astoundingly rapid shift from disinterest in early November to extreme concern and fear by December. This was fostered by intense media attention and especially by reports of influenza-related pediatric deaths that occurred in Colorado in late-November. While there were no shortages, delays or substantial demand for vaccination at the beginning of the season, the public's sudden and unpredicted attitude change caused shortages and long lines at many facilities.

However, despite the intense concern and attention influenza received during this season, a review of local and national surveillance measures indicates the overall severity of the season was actually quite typical—while more severe than the previous three years which were exceptionally mild, the season was comparable, if not lower, in levels of morbidity and mortality to other seasons characterized by a type A viral strain, such as the 1999–2000 season.

The following summarizes the major events that occurred during the 2003–2004 influenza season as well as surveillance efforts that detail the occurrence and impact of influenza.

EVENT SUMMARY

During December 2003, the U.S. media depicted nationwide influenza activity as unusually and unexpectedly severe and deadly—and their numerous fear-provoking reports instigated a ground swell of intense public anxiety and demand for vaccination. However, the impending severity of the 2003–2004 season wasn't entirely unexpected. Even before vaccination clinics were opened across the nation, there were indications that upcoming season would be especially severe. Because the southern hemisphere experiences its winter season during our summer months, what occurs below the equator sometimes serves as a precursor or sequel for activity in the northern hemisphere. In August 2003, reports of unexpectedly severe influenza activity were received from New Zealand and Australia. In addition to epidemic levels of morbidity and mortality, three factors were especially foreboding. First, among the influenza viruses circulating in the southern hemisphere, the overwhelmingly predominant virus type was type A H3N2—a form of influenza virus that tends to yield more intense symptoms and resulting higher levels of illness and death than other forms of the virus. Moreover, this particular strain of influenza (A/Fujian/411/2003) was a novel drifted strain, not included in recent vaccination compositions, and as such, existing public immunity was unlikely. Third, the identification of this strain and the subsequent predictions that it would also likely impact the U.S. occurred too late to modify the 2003–2004 U.S. influenza vaccine composition. Thus as early as August of 2003, more than 5 months before the media picked up the story, public health officials in the U.S. were bracing for what would most likely be a severe season caused by an impending novel and virulent influenza virus about to hit a immunologically naïve population.

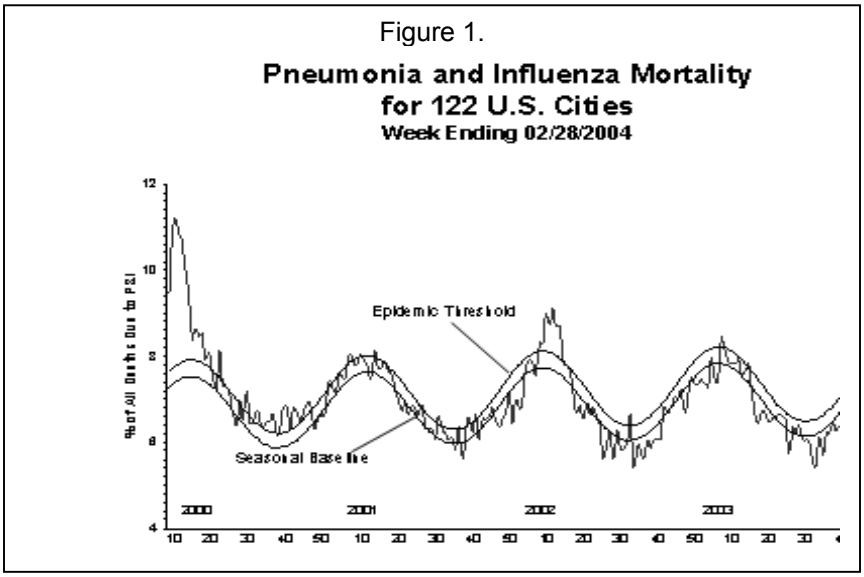
But despite the warnings from Public Health urging vaccination and preparation for the influenza season, initial interest was mild at best. No shortages, delays or staggered scheduling impacted influenza vaccination—in fact, there was actually more vaccine available this season than previously—and vaccination clinics proceeded with limited public demand. Similarly, the debut of FluMist, a live attenuated influenza vaccine administered via a nasal spray, was a disaster; as of mid-November 2003, only 400,000

doses were sold to pharmacies and doctors' offices—a far cry from the manufacturer's forecasted sales of 4 to 6 million doses.

But by early December, public interest in influenza changed dramatically. Several events likely contributed to the sudden heightened attention and fear of influenza. First, during mid-November, media interest was piqued by a report published in the New York Times which predicted that the 2003–2004 influenza season would be the "worst in 30 years" leading to unprecedented illness and death. Shortly after, the Colorado Department of Health began reporting a series of pediatric deaths associated with influenza. This received extensive media attention and was followed up by media reports of additional influenza-related pediatric deaths in other states across the nation. While deaths due to influenza, including pediatric deaths, occur every year, there was concern that the novel Fujian strain was particularly virulent among pediatric cases. Accordingly, the CDC initiated a special research project requesting active surveillance for pediatric intensive care (ICU) patients and deaths with evidence of influenza infection. By mid to late-December, public demand for vaccination reached an all-time high, and the sudden surge in people who wanted vaccination caused long lines and shortages in many areas. Oddly, the surge in interest in influenza corresponded with the peak in cases both locally and nationwide; incident influenza cases reached their highest level peaked during weeks 50–52. The number of new cases and corresponding public interest both quickly declined into the New Year.

NATIONAL INFLUENZA SURVEILLANCE FINDINGS

Figure 1.



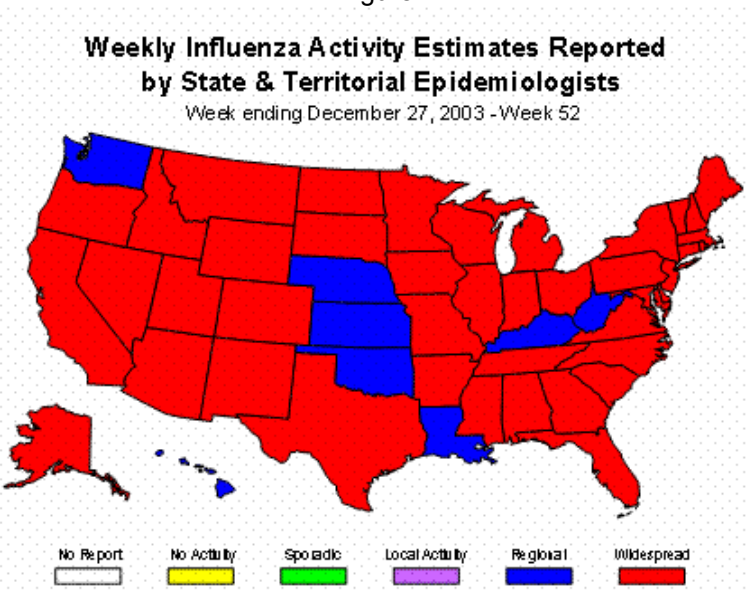
The onset, acceleration and duration of influenza activity during the 2003–2004 season were surprising and dissimilar from the three previous years. However, contrary to public perception and media depiction, the overall severity of the season was actually not out-of-the-ordinary—especially as compared to seasons characterized by prevalent type A strains in circulation as last occurred during the 1999–2000 season. This is best illustrated by the national pneumonia and influenza mortality rates (Figure 1). The percent of pneumonia and influenza-related deaths that occurred during 2003–2004 was similar to 1999–2000. However, the duration of the 2003–2004 peak activity was shorter than that comparable season and occurred earlier than predicted by the established epidemic threshold curve. The small 2002 peak in activity at the center of the graph depicts the late-season influenza outbreaks caused by a novel type B strain that, like most type B influenza outbreaks, predominantly affected young children (described previously in the 2001 ACDC Special Reports[1]). These national statistics can also help explain the intense public interest that influenza received this season. Since activity was so mild for the past three years, it is understandable that the 2003–2004 might seem unusual as compared to recent memory.

But more telling is the CDC's weekly map indicating levels of influenza activity occurring across the nation (Figure 2). During week 52, nearly the entire nation reported the highest level of influenza activity, "regional" activity. Rarely have so many states reported this high level of activity concurrently; more typically, peak levels of influenza activity occur sporadically in states across the nation, often first in the eastern states then peaking gradually westward. Moreover, not only was this nationwide simultaneous

1 Reynaldo S. Late season, light season: Los Angeles County influenza surveillance and elementary school outbreaks, 2001–2002. Acute Communicable Disease Control Special Studies Report 2001: 13–17. Available at: www.lapublichealth.org/acd/reports/annual/Special%20Report%202001.pdf

peak in incidence unique, its early occurrence was also surprising—on average, nationwide influenza incidence more typically peaks several weeks later after the new year. Again, this likely contributed to the misperception that the season was unusually severe.

Figure 2.



LOS ANGELES COUNTY INFLUENZA SURVEILLANCE FINDINGS

Influenza surveillance presents a unique challenge since individual cases are not reportable or counted by health departments. Tracking individual cases would overwhelm any health department because so many people are susceptible and infected yearly; during a mild season it is estimated about 10% to 15% of the population becomes infected, in a more severe season, 20% or more of the population can suffer from influenza. As such, in order to assess the local seasonal pattern of influenza activity, our county relies on positive influenza viral isolates reported from sentinel hospital laboratories. When combined with clinical information from the community, these isolate reports are a valuable resource since they describe the onset, peak and duration of influenza activity. In addition, since this surveillance method is fairly consistent from season to season, it provides a practical means of comparing seasons.

What occurred during 2003-2004 was unusual and also demonstrates the discord between the public's reaction to influenza versus ultimate impact of the 2003–2004 season. The number of positive isolates reported during the 2003–2004 season was substantially greater than any of the previous four seasons (Figure 3). In fact, the demand for testing was so overwhelming that during the peak of activity (week 51), testing from our primary contributing laboratory, Kaiser Permanente, was suspended due to a depletion of supplies. The number of positive isolates is also clearly greater than the last comparable type A season, 1999–2000.

Based on the viral isolate findings alone, the 2003–2004 season appears to have been the most severe influenza season to hit our county in many years; however, the rates of influenza-related hospitalizations and deaths tell a different picture. Kaiser Permanente data aggregated from Southern California shows the 2003–2004 season resulted in *fewer* influenza-related hospitalizations than the comparable 1999–2000 season (Figure 4). Similarly, there were fewer deaths in LAC due to pneumonia and influenza[2] during the 2003–2004 season versus the 1999–2000 season (Figure 5).

2 When pneumonia and influenza is classified as underlying cause of death.

The discrepancy in these findings can be explained by anecdotal accounts describing the surge in patient visits during 2003–2004 as consisting of the "worried well"—clinics were overwhelmed by individuals who were especially anxious, but not necessarily especially ill. In other seasons, when

Figure 3. Weekly positive viral isolates, all types

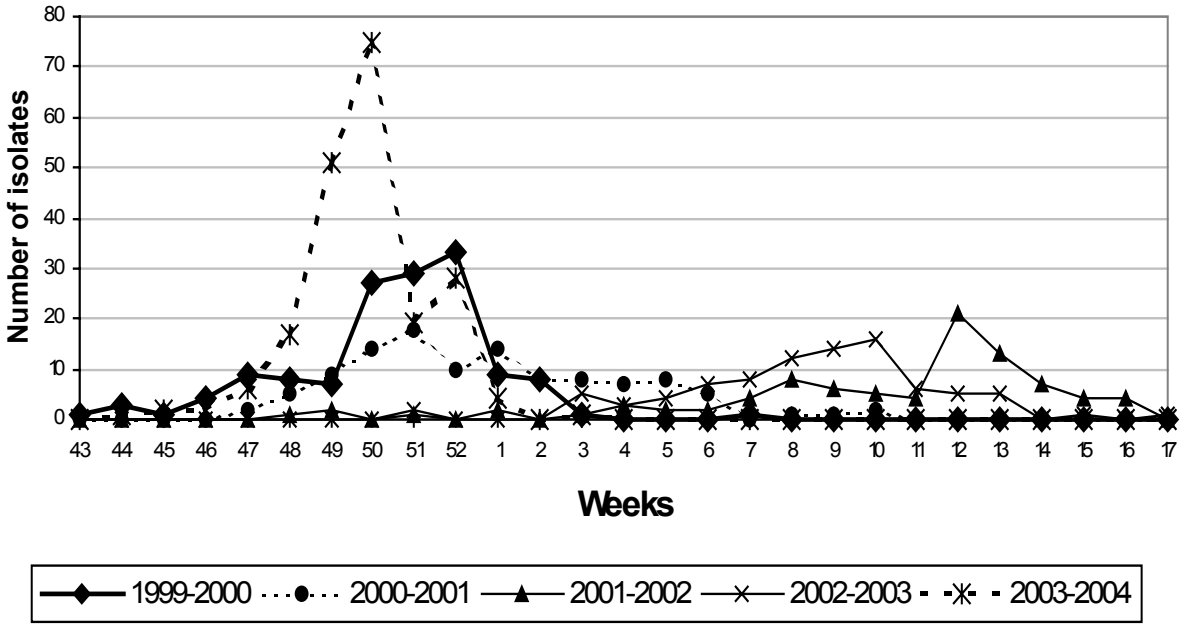


Figure 4.

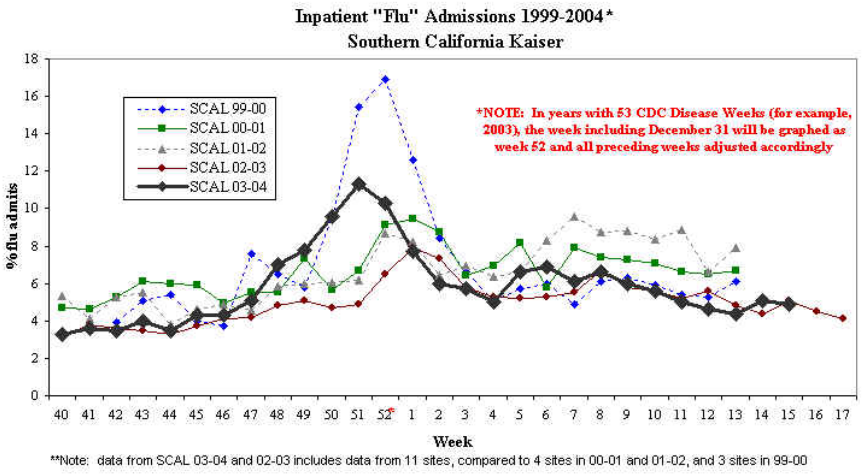
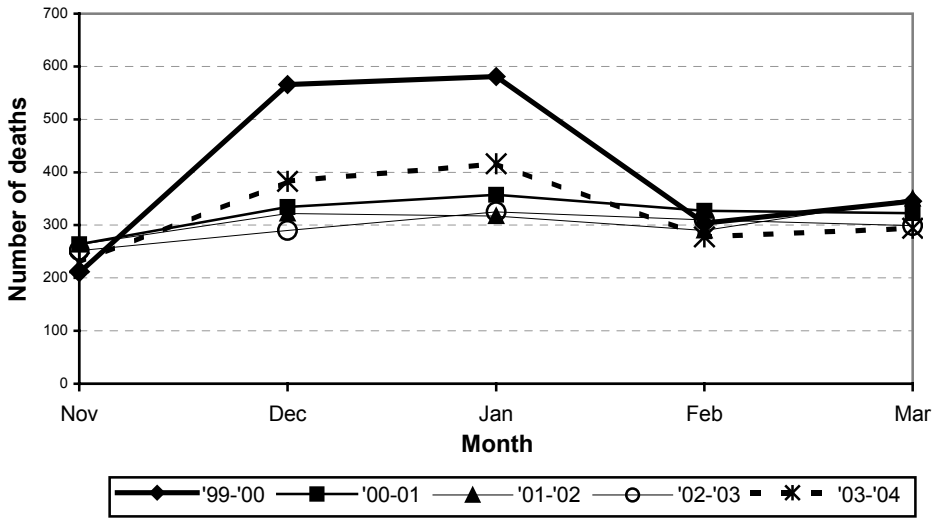


Figure 5: Pneumnia and Influenza Deaths by Month of Death



influenza did not garner the intense media attention that it did during late-2003, these individuals would have not have sought medical treatment.

Our county mortality data can also correct the prevailing misperception that the 2003–2004 season caused unprecedented numbers of influenza-related pediatric deaths (Table 1). Comparing the seasons, there were actually *fewer* pediatric deaths during 2003–2004 than the previous four seasons.[3] And more importantly, pediatric cases consistently contribute only slightly to the overall pneumonia and influenza mortality rate; across the past five years, more than 90% of all deaths resulting from pneumonia and influenza were among residents 65 years and older. This finding further demonstrates the overwhelming need to vaccinate the elderly in our county.

Table 1: Pneumonia and Influenza Deaths by Age-Group and Influenza Season*

	Influenza Season									
	1999-2000		2000-2001		2001-2002		2002-2003		2003-2004	
Age Group	no.	%	no.	%	no.	%	no.	%	no.	%
<1	7	0.3	8	0.5	7	0.5	4	0.3	2	0.1
1–4	0	0.0	1	0.1	2	0.1	1	0.1	3	0.2
5–14	1	0.0	0	0.0	0	0.0	2	0.1	2	0.1
15–24	0	0.0	0	0.0	2	0.1	2	0.1	3	0.2
25–34	6	0.3	4	0.2	2	0.1	2	0.1	2	0.1
35–44	10	0.5	11	0.7	10	0.6	12	0.8	4	0.3
45–54	21	1.0	19	1.2	21	1.4	26	1.8	23	1.4
55–64	66	3.3	56	3.5	54	3.5	61	4.1	54	3.4
65–74	266	13.3	182	11.3	192	12.5	178	12.1	201	12.6
75–84	651	32.5	499	31.1	523	33.9	483	32.7	516	32.3
85+	978	48.8	825	51.4	729	47.3	705	47.8	790	49.4
TOTAL	2,006		1,605		1,542		1,476		1,600	

* Seasonal frequencies; months November through March.

3 When pneumonia and influenza is classified as underlying cause of death.

ENHANCED PEDIATRIC INFLUENZA SURVEILLANCE

In light of the reports of influenza-related pediatric deaths in Colorado mid-November 2003, the CDC responded with a special surveillance project; doctors and hospitals were asked to report influenza-associated pediatric deaths as well as pediatric intensive care cases with confirmed influenza infection, particularly cases of encephalopathy or encephalitis. Across California, 124 severe influenza cases were reported throughout the season including 8 deaths. Of these, many of the cases (n=48, 39%) including 3 deaths were reported from LAC.

Since this was the first year such a project was enacted, data from previous years are unavailable for comparison. Nonetheless, the findings provide some interesting information about pediatric influenza cases. Of note, about half of the California cases (n=67, 54%) and half of the LAC cases (n=24, 50%) fall into risk groups for which influenza vaccination is currently recommended by the CDC (e.g., age 6 to 23 months or possessing a chronic medical condition such as cardiac, pulmonary or endocrine disease or immunocompromised status). But more importantly, very few of these high-risk cases reported receiving influenza vaccination; only 12 (13%) of the high-risk California cases and 3 (13%) of the high-risk LAC cases reported influenza vaccination for the 2003–2004 season. Thus the vast majority of children cases in need of influenza immunity are not being vaccinated.

IMMUNIZATION CHANGES FOR 2004–2005

As expected, the vaccine composition for the 2004–2005 season has been adapted to include the novel Fujian strain that was prevalent during 2003–2004. Also, because of heightened concern surrounding pediatric influenza cases, the National Immunization Program of the CDC implemented two important changes for the 2004–2005 season. First, recommendations for vaccination have been expanded to protect more people from influenza, including infants and children 6 to 23 months of age, as well as household contacts and out-of-home caregivers of children 0 to 23 months of age; the goal is to prevent these contacts from infecting young children with influenza.[4] Second, funding has been allotted to stockpile vaccine to ensure better access to vaccination for children 18 years and younger eligible for the Vaccine for Children program, an estimated 54% of children.[5]

CONCLUSIONS

Once again, influenza continues to surprise. While 2003–2004 was expected to be more severe than the previous few years, the sudden change in public and media interest was astounding. This suggests that better public health communication campaigns are needed to alleviate public anxiety and thereby curb needless medical and emergency room visits that can easily overwhelm the system. Also surprising was the discord between the media's depiction and the public's perception of the season's severity versus the severity as indicated by empiric morbidity and mortality measures. While numerous individuals were ill this season, rates of hospitalizations and deaths were not comparable to the level of fear that was generated. It is unclear whether the dramatic surge in demand for vaccination prevented those at greatest need (i.e., the elderly and immunocompromised) from receiving vaccination, but the events of this season suggest that the ability to revise mid-season the strategies for vaccine distribution are as important as the strategies that are drafted at the beginning of each season. Finally, as demonstrated by this year's special pediatric surveillance project, it is alarming that very few children and infants who are at greatest risk for complications due to influenza are actually being vaccinated. Better awareness campaigns are needed to improve the pediatric vaccination rate.

4 CDC. Prevention and control of influenza: Recommendations of the advisory committee on immunization practices (ACIP). MMWR 2004; 53:1–43. Available at: www.cdc.gov/mmwr/pdf/rr/rr53e430.pdf

5 CDC. Influenza Vaccine Bulletin #2. May 20, 2004. Available at: www.cdc.gov/nip/flu/bulletins-flu/2004-05/bulletin2_052004.htm

SEVERE ACUTE RESPIRATORY SYNDROME (SARS): A SUMMARY OF THE 2003 GLOBAL OUTBREAK AND LOCAL IMPACT

Severe acute respiratory syndrome (SARS) was the first highly virulent, readily transmissible respiratory infectious disease to impact our modern global society. While the advent of a new infectious disease was not surprising, what was alarming was how rapidly it spread—over the course of just a few months in the spring of 2003, cases were identified in more than two dozen countries across several continents with the majority of cases occurring in Asia. The first human cases were identified in November 2002 in Guandong, a southern province of mainland China, and once containment of was declared 8 months later, over 8,000 cases were reported worldwide—of these, 774 died. Fortunately, the US escaped both widespread illness and community transmission; only 8 cases with laboratory confirmed SARS infection were reported in the US, all had traveled to other parts of the world.[1]

SARS is a viral respiratory illness caused by a novel coronavirus, SARS-associated coronavirus (SARS-CoV), and is spread through close person-to-person contact via infectious respiratory droplet secretions. Typical symptoms begin with fever (often greater than 100.4^{o} F) progressing to malaise, body aches, and then lower respiratory illness (e.g., shortness of breath, dry cough). A small percentage of cases also develop gastrointestinal illness (e.g., diarrhea). Many cases progress to pneumonia. During the global outbreak of 2003, CDC categorized the identification of potential SARS cases in the US into two types: suspected versus probable cases. Suspected cases presented with basic SARS symptoms (e.g., fever and signs of lower respiratory illness) plus at least one SARS-exposure risk factor (e.g., travel to an area with known community transmission or close contact with a potential SARS case). Probable cases had the same symptoms and risk factors as suspected cases, but also had radiographic evidence of pneumonia or acute respiratory distress syndrome (ARDS). Since the primary SARS risk factor for US cases was travel to a SARS-associated area, which changed frequently over the course of the outbreak, the basis for SARS case identification was constantly in flux and was terminated when incident cases were no longer identified abroad.[2]

In retrospect, the World Health Organization (WHO) developed the following core conclusions regarding the transmission of SARS infection:[3]

- SARS is primarily not an airborne disease. The principal method of SARS transmission has been through direct contact (i.e., to eyes, nose, mouth, etc.) with infectious respiratory secretions. Some studies suggest that airborne (aerosolized) transmission and fecal-oral transmission can occur,[4] this may partially explain some unusual occurrences of SARS transmission such as the outbreak at the Amoy Gardens apartment in Hong Kong; however, these are rare and atypical events—droplet transmission is the predominant method of SARS transmission. As such, the proper use of personal protective equipment and simple infection control techniques, such as frequent hand washing, are especially effective methods of preventing illness.
- Risk of transmission is greatest around day 10 of illness. Since viral titers peak around day 10 of illness and then decline, when symptomatic cases are effectively isolated within 5 days of onset of illness, few secondary cases occur.
- There is no risk of transmission 10 days following resolution of fever. This finding further supports the infection control recommendations to isolate cases, even suspected cases, until 10 days following resolution of fever as well as to enact flight restrictions and other containment measures which center on screening individuals for fever.
- Healthcare workers were at increased risk for infection. Since healthcare workers are more likely to be exposed to SARS cases during their peak of infectivity and because they have a higher potential of coming in contact with infectious respiratory secretions, healthcare workers—especially those

1 CDC. Revised U.S. surveillance case definition for severe acute respiratory syndrome (SARS) and update on SARS cases—United States and worldwide, December 2003. MMWR 2003; 52(49):1202–1206. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5249a2.htm

2 WHO. Update 92—Chronology of travel recommendations, areas with local transmission. Available at: www.who.int/csr/don/2003_07_01/en

3 WHO. Consensus document on the epidemiology of severe acute respiratory syndrome (SARS). Department of Communicable Disease and Response. Available at: www.who.int/csr/sars/en/WHOconsensus.pdf

4 Tong TR, Liang C. Evidence of airborne transmission of SARS. NEJM 2004; 351(6):609-611.

responsible for aerosol generating procedures such as intubating a patient—are at high risk for infection. While the SARS outbreak was eventually contained, the threat of SARS remains and likelihood of new infections and global spread continues. As such, it is critical that healthcare facilities maintain effective infection control procedures and be diligent in the identification of possible cases.

- Children are rarely affected by SARS. As of publication of their recommendations (May 2003), WHO reports only two cases of SARS transmission from children to adults and no evidence of any child-to-child transmission or transmission in schools. The manifestation of SARS in children is controversial and further investigation is needed to determine whether children may have asymptomatic or mild SARS infections.

SUMMARY OF LOS ANGELES COUNTY SARS CASES

Over the course of nearly 6 months (from late March when the first potential LAC SARS case was identified until case identification was terminated by the CDC in mid-August), a total of 22 cases were investigated for possible SARS infection in LAC—none of these cases had a specimen positive for SARS Co-V (Table 1). More than half of the investigated cases (68%, n=15) were classified as a suspect SARS case since their illness did not progress to pneumonia and they showed no signs of respiratory distress syndrome. Many (32%, n=7) were foreign cases, not local residents, who were visiting our county or identified when traveling through the Los Angeles International airport. The SARS exposure risk factor for all but one of the cases (a child of another LAC suspect case) was travel to a SARS-associated location, all from various areas in Asia (e.g., China, Taiwan). None of the potential cases held sensitive occupations or were healthcare employees.

Table 1: Summary of LAC SARS Cases*

	Probable SARS (n=7)	Suspect SARS (n=15)	Total SARS Cases (n=22)
Classification completed	**7**	**6**	**13**
Other diagnosis	1	0	1
Negative SARS Co-V convalescent Ab	6	6	12
Classification unable to be completed	**0**	**9**	**9**
Foreign resident; final tests unavailable	0	7	7
Testing incomplete; refused convalescent testing	0	2	2
Classification pending final tests	**0**	**0**	**0**
Confirmed positive SARS Co-V	**0**	**0**	**0**

* Includes case investigations only as of 8/13/2003.

LESSONS LEARNED

While none of the locally investigated cases was diagnosed with SARS, the response required of public health was substantial; tremendous effort was necessary for both public and professional outreach and numerous materials were developed including extensive education materials and clinical guidelines and protocols. Many of these materials are available on the ACDC website (www.lapublichealth.org/acd/SARS.htm). The planning and materials have served as valuable resources for other infectious diseases (including pandemic influenza) and will be critical should global transmission of SARS recur.

Many important lessons were learned as a result of our SARS investigations. The following are a few of the key considerations and issues that were addressed:

- Public health partnerships with hospitals and community healthcare organizations are critical. This was an important lesson learned worldwide as well as in LAC. Accordingly, Acute Communicable Disease Control has established the Hospital Outreach Unit (HOU) and assigned liaison public health nurses (LPHN) to interface with all hospitals in our county. The LPHN are responsible for improving overall disease reporting and preparedness for emerging infectious diseases in their assigned hospitals. This new program also facilitates the communication between our health department and the hospitals and improves relationships.
- Early detection of disease is paramount. Physicians and hospital staff were, and continue to be, on the front lines of SARS. They will be the first to identify new cases should SARS recur. Similarly, if their detection and infection control procedures are flawed, it is hospital staff and their close contacts (i.e., their families and other patients) that are most likely to be affected. Systems of monitoring rates of respiratory illness among hospital staff are currently being considered as a method of early SARS and other disease outbreak detection.
- Infection control is an ongoing responsibility. As mentioned previously, standard infection control practices proved critical in ending the SARS epidemic. However, now that the fear and saliency of SARS has subsided, it is easy to neglect consistent infection control practices. Healthcare facilities need to implement periodic evaluations of their infection control practices and their ability to identify both potential SARS cases as well as other individuals with unique infectious diseases (e.g., pandemic influenza cases). ACDC has conducted and continues to provide hospitals with extensive education in infection control including methods for proper hand hygiene, respiratory hygiene, and the use of personal protective equipment.
- Physicians should consider and test for differential diagnoses. CDC guidance permits reclassification of potential SARS cases if another diagnosis is obtained which can fully explain the patients' condition. While all medical professionals should be alert for and suspicious of potential SARS cases, during the 2003 pandemic, only 8 confirmed SARS cases were identified in the US; the overwhelming majority of suspected SARS cases were actually ill with more common respiratory pathogens (e.g., influenza, Mycoplasma pneumoniae, Chlamydia spp., parainfluenza, respiratory syncytial virus, adenovirus, etc.). For example, in California molecular testing decreased suspicion for SARS in nearly half of the suspected SARS cases (45%, n=23) and nearly half of the probable SARS cases (47%, n=9).5 Thus to limit both the anxiety and the special resources that occur in the diagnosis of potential SARS case, healthcare facilities should be well stocked with the supplies to obtain a more likely differential diagnosis and physicians should be well versed in their ability to test for and obtain such an alternative diagnosis.
- Surge capacity needs to be addressed. In an epidemic event, health facilities need to be aware of their available resources (e.g., isolation rooms, intensive care unit beds, ventilators, staffing, supplies, etc.). A specific issue that occurred in our county involved the housing of foreign cases. Many of the investigated potential LAC cases during 2003 were foreign visitors, not local residents. And in light of the high proportion of travelers into our county, coupled with the fact that should SARS recur it will most likely again begin in another country (again most likely in Asia), there is a great need to have special housing available for foreign cases and their family to be able to quarantine and monitor these individuals during the 10 day infective period.
- Rapid dissemination of information helps to control panic. Methods of communication should be set up before the event occurs. Information technology needs to be up-to-date. Media plays an important role. Call centers and hotlines should be available continuously (24 hours, 7days a week) and accessible in multiple languages.
- Planning and preparedness needs to be an ongoing process. ACDC continues to develop and adapt to the constantly changing SARS situation as well as for other potential major public health events (e.g., pandemic and avian influenza). This includes developing preparedness plans and testing these plans through a variety of training exercises (e.g., SARS table top exercises).

5 Louie JK, Hacker JK, Mark J, et al. SARS and common viral infections. EID 2004; 10(6). Available at: www.cdc.gov/ncidod/EID/vol10no6/03-0863.htm

LAC and the US escaped widespread transmission of SARS, but other locations (such as Toronto) were not as lucky. And again, in light of the high prevalence of international travelers in our county, the likelihood of the introduction of a novel deadly disease is great. Even if SARS does not recur, other diseases (e.g., avian influenza or pandemic influenza) are imminent and the SARS outbreak of 2003 can serve as a valuable lesson for future preparation and prevention.

Acute Communicable Disease Control
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2003

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ACUTE COMMUNICABLE DISEASE CONTROL
2003 ANNUAL MORBIDITY REPORT

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- Coccidiodomycosis .....Alison Itano, MS
- Cryptosporidiosis .....Priya Mukhopadhyay, MPH
- Encephalitis..... Rachel Civen, MD, MPH
- *Escherichia coli* O157:H7 / Hemolytic Uremic Syndrome..... Rita Bagby, RN, MSN, PHN
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- Meningitis, Viral..... Karen Perdue, MPH
- Meningococcal Disease ..... Melba Veza, RN, BSN, PHN
- Mumps ..... Dulmini Kodagoda, MPH
- Pertussis (Whooping Cough)..... Dulmini Kodagoda, MPH
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- Shigellosis..... Rita Bagby, RN, MSN, PHN
- Streptococcus, Group A Invasive Disease (IGAS) ..... Melba Veza, RN, BSN, PHN
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- Typhoid Fever, Carrier ..... Rita Bagby, RN, MSN, PHN
- Typhus ..... Karen Perdue, MPH
- Vibriosis ..... Amy Gallagher, MPH

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- Foodborne Outbreaks..... Amy Gallagher, MPH
- Healthcare Associated Outbreaks ..... Melba Veza, RN, BSN, PHN

Special Disease Summaries Contributors

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- Influenza ..... Sadina Reynaldo, PhD
- Severe Acute Respiratory Syndrome (SARS) ..... Sadina Reynaldo, PhD

Acute Communicable Disease Control
Publications and Presentations
2003

PUBLICATIONS

Brunell PA, Mascola L, Lieberman JM, et al. Expanding Strategies for the Prevention of Hepatitis A in children. Infectious Diseases in Children. February 2003.

CDC. Methicillin-resistant *Staphylococcus aureus* infections among competitive sports participants—Colorado, Indiana, Pennsylvania, and Los Angeles County, 2000–2003. MMWR 2003; 52(33): 793–4. (ACDC author: Mascola L) Available at: www.cdc.gov/mmwr/PDF/wk/mm5233.pdf

CDC. Methicillin-Resistant Staphylococcus aureus infections in correctional facilities—Georgia, California, and Texas, 2001–2003. MMWR 2003; 52(41):992–95. (ACDC authors: Bancroft E, Jones A, Itano A, Chambers M, Mascola L) Available at: www.cdc.gov/mmwr/PDF/wk/mm5241.pdf

CDC. Public Health Dispatch: Outbreaks of community-associated Methicillin-resistant *Staphylococcus aureus s*kin infections—Los Angeles County, California, 2002–2003. MMWR 2003; 52(5): 88. (ACDC author: Bancroft E) Available at: www.cdc.gov/mmwr/PDF/wk/mm5205.pdf

Sejvar J, Bancroft E, Winthrop K, Bettinger J, Bajani M, Bragg S, Shutt K, Kaiser R, Marano N, Popovic T, Tappero J, Ashford D, Mascola L, et al. Leptospirosis in "Eco-challenge" athletes, Malaysian Borneo, 2000. Emerg Infect Dis 2003; 9(6):702-7. Available at: www.cdc.gov/ncidod/EID/vol9no6/02-0751.htm

Mondy C, Cardenas, D., Avila, M. The role of an advanced practice public health nurse in bioterrorism preparedness. Public Health Nursing 2003; 20(6):422-431.

PRESENTATIONS AND ABSTRACTS

Bancroft E. Community Associated MRSA in Los Angeles County. Invited Speaker, CDC/CSTE Meeting, 2003; Atlanta, Georgia.

Bancroft E. Outreach to Providers and the Public about Antibiotic Resistance-Using Resources of the Health Department. Invited Speaker, CDC/CSTE Meeting, 2003; Atlanta, Georgia.

Bancroft E, Jones A, Mascola L, et al. Four outbreaks of community associated methicillin-resistant *Staphylococcus aureus* in Los Angeles County, 2002. 41st Annual Meeting of the Infectious Diseases Society of America, 2003; San Diego, California.

Bancroft E, Jones A, Tadesse M, Clark J, Mascola L. An outbreak of community onset methicillin-resistant *Staphylococcus aureus* skin infections in the Los Angeles County Jail 2002. Annual meeting of the Society for Healthcare Epidemiology of America, 2003; Washington, DC.

Campos Bovee M. Syndromic surveillance in Los Angeles County: Systems to improve detection of BT events and unusual infectious diseases. Southern California Epidemiology and Surveillance Summit, 2003; San Diego, California.

Campos Bovee M, Walshe L, Jones J, Aller R. Unexplained death surveillance project in Los Angeles County: An opportunity to collaborate with the Department of Coroner and explore this novel surveillance and case finding activity. Advancements in Surveillance and Epidemiology for Bioterrorism Conference, 2003; Miami, Florida.

Chambers MJ, Bancroft E, Tadesse M, Clark JH, Mascola L. Characterization of hospitalizations related to a methicillin-resistant *Staphylococcus aureus* outbreak in the Los Angeles County Jail in 2002. 41st Annual Meeting of the Infectious Diseases Society of America, 2003; San Diego, California.

Civen R, Maupin TJ, Xiao H, Seward JF, Jumaan AO, Mascola L. A population-based study of herpes zoster (HZ) in children and adolescents post-varicella vaccine licensure. 41st Annual Meeting of the Infectious Disease Society of America, 2003; San Diego, California.

El Amin A, Cordova S, Gambill D. The effectiveness of interim CDC guidelines in restricting use of the pneumococcal conjugate vaccine in public health community clinics during the nationwide shortage. National Immunization Conference, 2003; Chicago, Illinois.

Frumes S, Gallagher A, Reporter R, Mascola L. A description of changes in *Salmonella* outbreaks in Los Angeles County from 1998–2002. West Coast Epidemiological Association Conference, 2003; Ashland, Oregon.

Gambill D, Wake E, Howe J. Reducing vaccine waste in Vaccine for Children (VFC) program provider offices. National Immunization Conference, 2003; Chicago, Illinois.

Guevara RE, Dela Cruz H, Tamjid B. Predictors for restaurant inspection score: Preliminary results from a study on food safety knowledge, attitudes, and behaviors among restaurant workers in Los Angeles County. 131st American Public Health Association Meeting and Exposition, 2003; San Francisco, California.

Guevara RE, Gallagher AM, Mascola L. An 11-year retrospective study on listeriosis in Los Angeles County, 1992-2002. 41st Annual Meeting of the Infectious Diseases Society of America, 2003; San Diego, California.

Kodagoda D, Nelson A, Kwok G, Mc Coy L. Atypical seasonal increase in reported pertussis cases, Los Angeles County 2001-2002. National Immunization Conference, 2003; Chicago, Illinois.

Mondy C. Bioterrorism Surveillance in Los Angeles County. National Association of Local Boards of Health Annual Conference, 2003; Baltimore, Maryland.

Mondy C. Public Health Epidemiologic Rapid Response Teams. California Department of Health Services Regional Smallpox Outbreak Investigation and Response Training, 2003; San Diego, California.

Pulido M, Bancroft E, Kodagoda D, Nelson A, Cordova S, Gambill D. Has the hepatitis A vaccine affected disease rates in Los Angeles County? National Immunization Conference, 2003. Chicago, Illinois.

Reporter R. The changing epidemiology of salmonellosis in Los Angeles County 1992–2001. 41st Annual Meeting of the Infectious Diseases Society of America, 2003; San Diego, California.