



Acute Communicable Disease Control Annual Morbidity Report 2005

• 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 HIV or AIDS. Surveillance is primarily passive, with reports submitted via facsimile, mail, or telephone by providers and electronically from several laboratories. Reporting urgency varies according to disease and ranges from immediate reporting by telephone to the LAC Department of Public Health (DPH) to reporting required within 7 days of identification.

In addition to disease surveillance and investigation, ACDC sets policy and procedures for DPH activities related to infectious and communicable disease prevention and control. 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 Infections Unit:** This unit conducts surveillance and provides disease consultation for a variety of vectorborne and zoonotic diseases (e.g., West Nile virus, plague), meningococcal disease, and other causes of encephalitis and meningitis. The Varicella Surveillance Project has been operating for more than 10 years and as part of this unit.
- **Hospital Outreach Unit:** This unit assists hospitals with outbreak investigations, consults on infection control issues, and enhances communication with hospitals by interacting with infection control practitioners, emergency departments and laboratories.
- **Bloodborne Pathogens and Antimicrobial Resistance Unit:** Conducts surveillance and investigations of the viral hepatitis, MRSA, and invasive disease caused by meningococcus and group A streptococcus.

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, it encompasses a wide variety of geographic areas including mountain ranges, arid deserts, and over 80 miles of ocean coastline. Accordingly, one of the greatest challenges of disease surveillance, response and control in our county is responding to its enormous size. LAC presently has the largest population (nearly 10 million) of any county in the US and is exceeded by only eight states. LAC is densely populated, with over one-fourth of the state's population. Accordingly, medical services in LAC are also extensive—LAC is home to approximately 100 hospitals with 80 emergency departments, more than 30,000 licensed physicians, over 450 subacute healthcare facilities, and about 25 thousand retail food purveyors.

Another challenge is the extensive diversity of our population coupled with a high level of immigration. Nearly half of our residents are Latino (48%), around one-third White (30%), and around one-in-ten Asian (13%) or Black (9%). Our residents report over 90 languages as their primary spoken language. 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 a 1999 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 reported settling in LAC. In addition to immigration, the population in our county is highly mobile. In terms of air travel alone, each year roughly 55 million travelers come through the Los Angeles International airport (over 40 million domestic and 14 million international flights yearly)—making it the nation's 3rd busiest airport.



- **Immunization Program:** The mission of this program is to improve the immunization coverage levels of LAC and prevent the occurrence of vaccine-preventable diseases. Activities include the perinatal hepatitis B case management, smallpox vaccination program, and the coordination of the influenza outreach program.
- **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 responding to notable instances identified by these systems.

**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, 2005

While optimists envision a day when we will conquer infectious diseases, the likelihood of this is far away as novel and reemerging diseases continually manifest—every year new diseases emerge and existing diseases acquire added prominence, and 2005 was no exception. One of the more noteworthy communicable disease events in LAC during 2005 was a countywide outbreak of hepatitis A (see 2005 Special Reports and the 2005 Annual Report for more information). In 2005, ACDC implemented CDC and Council of State and Territorial Epidemiologist (CSTE) criteria to standardize surveillance for acute hepatitis A.¹ This change in case definition of what is a confirmed case contributed to a significant decrease in both the *number* of confirmed cases during the first seven months of 2005 as compared to the same period in the previous year (63 versus 205 confirmed cases) as well as a decrease in the *percent* of confirmed cases (20% versus 84%) among suspected cases reported during those seven months. However, starting in August of 2005, there was a generalized increase of acute hepatitis A throughout the entire county including five discreet outbreaks. There were 680 cases reported with acute hepatitis A during the outbreak period, of which 417 (62%) met the CDC/CSTE laboratory or clinical criteria for acute hepatitis A. All tolled during this outbreak period (August-December), the incidence rate of acute hepatitis A was 10 times higher than the first seven months of 2005.

Emerging and Re-Emerging Diseases

- The latter half of 2005 saw a substantial increase in acute hepatitis A infections, including 5 outbreaks.
- In January, the first human death due to rabies in 30 years was identified.
- West Nile virus infection decreased substantially as compared to 2004; however, the virus is now enzootic to our region and further human cases can be expected.

Another disease of special note that re-emerged in 2005 was rabies. In January 2005, the first LAC human death due to rabies in 30 years was confirmed (see Special Reports 2005 for more information). While human rabies is very rare in the US, it is more common in other countries—and in particular, in countries whose citizens frequently immigrate to Los Angeles. Interviews with the decedent's household contacts and family members revealed no history of animal bites or exposures, but canine rabies is enzootic in El Salvador, Guatemala, and Mexico—the route he traveled to come to the US. Molecular studies by CDC identified the case's rabies strain as one not present in the US, but a canine variant from El Salvador. Risk of infection extended to many beyond this case; contact tracing identified at least 30 friends and family members to whom rabies post-exposure prophylaxis was highly recommended and 9 of 76 healthcare workers at risk were identified to receive post-exposure prophylaxis. This case illustrates the importance of considering the complete patient history, especially country of origin and travel history, during diagnosis. Moreover, many serious diseases (e.g., SARS, avian influenza) have

¹ Hepatitis surveillance is complicated by stringent case definitions that require the presence of a positive serologic test, evidence of liver damage, and clinical symptoms. Depending on the type of hepatitis, only 4-50% of the reported cases after investigation may be confirmed as acute.



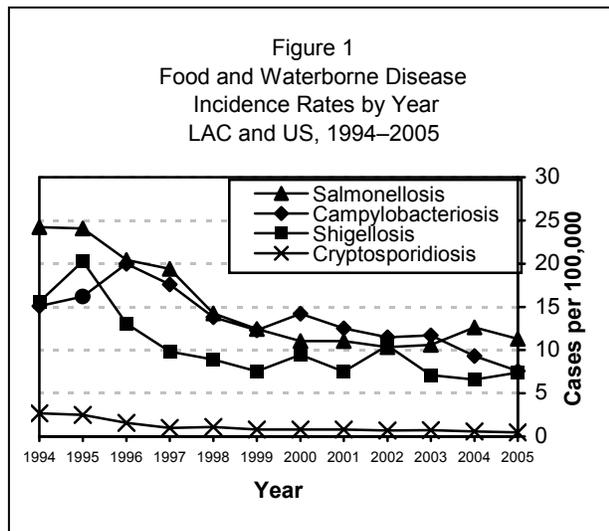
nonspecific presentations that can easily be misdiagnosed; epidemiologic factors (i.e., exposure and travel history) are critical for accurate diagnosis.

Finally, while West Nile virus (WNV) was undoubtedly one of the more notable infectious diseases to emerge in recent years, its local impact declined considerably in 2005. In 2004, LAC reported the greatest number of WNV infections of any jurisdiction in California, including 309 cases with 14 deaths. But in 2005, only 43 human WNV infections were reported, including 13 cases of encephalitis, 15 cases of meningitis, 9 cases of WNV fever, and 6 asymptomatic blood donors; there were no associated deaths. WNV environmental surveillance in mosquitoes, dead birds, and sentinel chickens documented that WNV has become enzootic in Los Angeles County (LAC). Corresponding to the 2005 human cases, there was dramatic decline in non-human WNV detections among horses, dead birds, mosquitoes, and sentinel chickens. Arbovirus experts speculate various environmental factors may have contributed to the decline of WNV activity in 2005—this includes changes in local weather conditions and aggressive mosquito abatement efforts. In addition, the massive crow die-off in 2004 dramatically reduced susceptible crow populations—a key component in the chain of WNV infection—which in turn contributed to declines in mosquito infection in 2005. Also it is likely that personal behaviors, such as increased use of mosquito repellent and avoidance of risky areas at prime mosquito times, may have played a role in the decline.

While the severity of future seasons cannot be predicted, WNV is now endemic to LAC and human cases will continue to occur. It is possible that human WNV cases will become more sporadic, with outbreaks occurring every 5-10 years—a cycle that been documented in WNV endemic areas outside of the US. Public health experts also predict that other arboviral diseases not currently found in the US, such as dengue, could be similarly introduced. Accordingly, having arboviral surveillance systems in place for early detection will remain important. Plus, healthcare providers must continue to be aware of proper diagnostic procedures, understand the importance of prompt reporting, and educate their patients to protect themselves against infection—especially those at high risk for neuroinvasive disease.

Food and Waterborne Diseases

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 reports for more details). The declining trend in reported cases is most evident among the bacterial diseases 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

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.



in LAC in 1998 may have also advanced food safety through education for food handlers and the public regarding best practices to reduce foodborne disease.

The LAC 2005 salmonellosis crude rate decreased 10.3% when compared to 2004 (Figure 1). It has remained below the national rate since 1998 after an overall decrease of more than 100% since 1994. Nationally, the incidence of salmonellosis cases has also been decreasing, but at a much slower rate than it has for LAC in the previous 10 years. Although many food items and both potable and recreational water sources have been implicated in the transmission of salmonella, salmonellosis is most commonly associated with eggs, poultry, and fresh produce. Another prominent source is contact with reptiles, either directly or through surfaces or other people exposed to reptiles. In 2005, at least 98 (9.0%) of LAC salmonellosis cases had contact with turtles, lizards or snakes.

In 2005, ACDC investigated 20% fewer foodborne disease outbreaks than in 2004, but more persons were affected. There were 32 foodborne disease outbreaks representing 783 individuals with illness. 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 continue to occur yearly. The majority of people affected by these illnesses improve without complications; however, some infections may cause invasive disease especially among children, the elderly and those with certain chronic medical conditions (e.g., the immunocompromised), leading to hospitalization and fatality. In LAC, food- or waterborne diseases were a contributing factor to at least 16 deaths during 2005. Accordingly, further efforts to improve food and water quality and to educate food industry and the public about proper food storage, handling, and preparation are needed.

Vaccine Preventable Diseases

Ten vaccine-preventable diseases are monitored by the LAC Immunization Program—each requires its own sensitive surveillance system tailored to the unique epidemiology of the disease. Since 2003, LAC has met the national Healthy People Year 2010⁵ goal of having 80% of the 19–35 month old population receive the recommended 4:3:1:3:3 vaccination.⁶ In 2005, LAC was recognized as one of the top five urban areas nationally having the highest 4:3:1:3:3 childhood vaccination coverage levels.

Despite these record high vaccination coverage levels, many challenges of controlling vaccine-preventable diseases continue in our county. For instance, a significant increase in the reported number of pertussis cases occurred in LAC during 2005 and a similar trend was identified throughout California and the US. In LAC, there was a three-fold increase in the number of reported cases as compared to the previous five-year average—not since the 1970s has LAC experiences this high magnitude of pertussis morbidity. While the cause of this rise in pertussis incidence is unknown, it may be due to a historical 3–5 year cyclical trend of increasing rates in conjunction with improved recognition and reporting. In addition, the rise may be related to the increase in cases reported among adolescents and adults—a typically under-recognized group for diagnosis and reporting, since pertussis is more commonly perceived as a disease of infants. More widespread use of the newly licensed DTaP vaccine for older children and adults may reverse this increasing trend in pertussis incidence.

In LAC and across California, other vaccine-preventable diseases such as measles, mumps, and rubella and invasive disease due to *Haemophilus influenzae* have been exhibiting low morbidity. However, these diseases continue to be endemic in other parts of the world. And in light of the LAC's high rates of immunization and international travel, it is imperative that our healthcare professionals be vigilant

Vaccine Preventable Diseases

- In 2005, LAC was recognized as one of the top five urban areas nationally to have the highest recommended childhood vaccination coverage levels.
 - However, during the same year, pertussis incidence hit a 30-year high in our county.
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⁵ <http://www.healthypeople.gov/data/>

⁶ Four or more doses of diphtheria, tetanus, acellular pertussis (DTaP) vaccine; 3 or more doses of polio vaccine; 1 dose of measles, mumps, rubella (MMR) vaccine; 3 doses of *Haemophilus influenzae* type b conjugate vaccine; and 3 doses of hepatitis B vaccine.



in their understanding, recognition, and reporting of these diseases. To assist, a rash-related illness surveillance system has been enacted in our county—as a consequence, over 60 reports of rash-related illness were investigated during 2005.

Among other vaccine-preventable diseases, our multi-lingual enhanced case management efforts continue to identify more infants exposed to perinatal hepatitis B—a 4% increase in case identification in 2005 as compared to the previous year. Because Asian/Pacific Islanders comprise the majority of pregnant women who test positive for hepatitis surface B antigen (81% in 2005), the Immunization Program's case managers speak 7 Asian languages including 4 Chinese dialects, and a full-time Korean case manager was added in 2005. Due to these increased efforts, over 96% of exposed infants in 2005 were able to receive immunization prophylaxis (for more information on perinatal hepatitis B efforts in LAC, see the 2005 Annual Morbidity Report).

Hospital Outreach Unit

In 2005, the most common cause of reported hospital outbreaks continued to be scabies. This was followed in number by outbreaks of *Clostridium difficile* enteritis and methicillin-resistant *Staphylococcus aureus* (MRSA) infections. In 2005, two high profile outbreaks occurred. The first, in January, was an outbreak of *Serratia marcescens* associated with cardio-thoracic surgery. A joint CDC investigation revealed the most likely source of infection as contaminated magnesium sulfate solution. The other outbreak involved MRSA infection and was associated with a hospital burn unit. Upon CDC laboratory analysis and review of the MRSA PFGE pattern, it was determined that the outbreak isolate was a unique Brazilian clone never before seen in LAC and rarely seen in the US. This Brazilian clone is the most common type of MRSA in parts of South America and has been reported in Hungary and Portugal, Argentina, Uruguay, Chile and the Czech Republic—but aside from the LAC event, only one other report of this strain causing an outbreak exists in the US. More detailed summaries of these investigations can be found in the Special Reports 2005 section.

In 2005, the most common outbreaks in skilled nursing and other sub-acute health facilities were due to scabies and gastroenteritis, similar to previous years. From 2004-2005, LAC experienced a dramatic increase in the number of reported scabies outbreaks in both acute care hospitals and skilled nursing facilities. The overall number of reported healthcare outbreaks has been steadily increasing over the last five years. Additional review of hospital outbreaks and investigations are available in ACDC's 2005 Morbidity Report. The Hospital Outreach Unit, a core feature of ACDC's continued outreach to the healthcare community, continues to enhance communication and outbreak reporting between health facilities and Public Health.

Bioterrorism Surveillance, Preparedness and Response

In 2001, the mandated list of reportable diseases was modified to provide greater emphasis on diseases deemed likely indicators of bioterrorism activity (i.e. anthrax, botulism, brucellosis, plague, smallpox, tularemia, and viral hemorrhagic fevers). Education to strengthen awareness and understanding of

disease and outbreak reporting continued throughout 2005, and ACDC provided tailored educational materials related to disease reporting to healthcare providers in LAC.

The primary achievements of ACDC's Bioterrorism surveillance and preparedness sections during 2005 were the continued integration of activities into routine public health operations. Emergency department syndromic surveillance, which

Bioterrorism Preparedness

- In 2005, BT-related surveillance projects were further expanded and integrated into public health. These systems were shown to be useful indicators of morbidity and mortality.
- An assessment of our timely detection of diseases was done through an evaluation of brucellosis reporting.

includes detecting major trends from baseline patterns of illness that may potentially identify bioterrorist-related activity, was continued at several local hospitals and additional hospitals were added to the system. Our syndromic surveillance proved capable of detecting patterns of illness and community



outbreaks and complemented traditional disease surveillance activities. Volume data from the ReddiNet® system for emergency department visits during influenza season strongly correlated with virologic test results. Since timely detection and reporting of cases is critical for effective disease surveillance, an evaluation of case “capture times” was performed on brucellosis cases, caused by an organism classified as a category B bioterrorism agent by the CDC.