



# THE PUBLIC'S HEALTH

Newsletter for Medical Professionals in Los Angeles County

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## *Lyme Disease: An Important Public Health Concern in Los Angeles County*

Despite the low risk of infection from tick exposure in Los Angeles County, Lyme disease (LD) is an important disease for health care providers to understand and diagnose. Because of the lack of reliable laboratory testing, clinicians should be aware of the signs and symptoms associated with LD and also the variable risk of transmission in areas where the patient may have traveled. When diagnosed early, LD can be easily treated and its late manifestations prevented.

### **What is lyme disease?**

LD is the most commonly reported tick-borne disease in the U.S., rising from 16,273 reported cases in 1999 to 19,804 cases in 2004 [1,2]. LD is a bacterial infection that can occur in multiple stages and involve multiple organ systems, including the skin, heart,

peripheral and central nervous and musculoskeletal systems. The spirochete that causes LD, *Borrelia burgdorferi*, is a zoonotic disease that circulates in nature in small rodents, with deer as a secondary reservoir—it only infects humans incidentally when bitten by infected ticks.

LD was first recognized in the U.S. in 1977 in Lyme, Connecticut. The first recognized human case in California occurred in 1978 in a hiker from Sonoma County. Although most cases of LD are reported from the northeastern U.S., LD has been well documented throughout California [3], has been a reportable disease in our state since 1989, and a laboratory reportable disease since 2005.

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## *Care for Rattlesnake Bites*

We are in the midst of “Rattlesnake Season” when the highest population of out-and-about rattlesnakes coincides with peak outdoor family activities. The California Poison Control System manages and reports approximately 250 cases of rattlesnake bites each year, with over 50 cases occurring in Southern California.

California is home to eight species of rattlesnakes, which may be spotted anywhere from off-road dirt trails to your own backyards and front porches. The most common Southern California rattlers include the Western Diamondback and Southern Pacific Rattlesnakes, though bites from Sidewinder, Speckled, Red Diamond, and Mojave Rattlesnakes are reported every year. For unsuspecting home gardeners, fervent hikers, or children playing in Griffith Park, rattlesnake bites are frightening, though not entirely unexpected, events.

The most important concept to grasp is that we live in *their* backyards, not the other way around. Therefore, prevention and avoidance are the most important methods to deal with rattlesnakes during the season.



### **How can you spot a rattlesnake?**

The rattle itself is the most notable feature; however, you may get fooled: rattlesnakes often lose their rattles during skin shedding or after fights with other animals. The pattern or coloring on the snake’s back is not a dependable way to distinguish rattlers from non-rattlers. Rattlers tend to have “pointy” heads, in addition to hooded eyes with elliptical pupils.

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# THE PUBLIC'S HEALTH



313 North Figueroa Street, Room 212  
Los Angeles, California 90012

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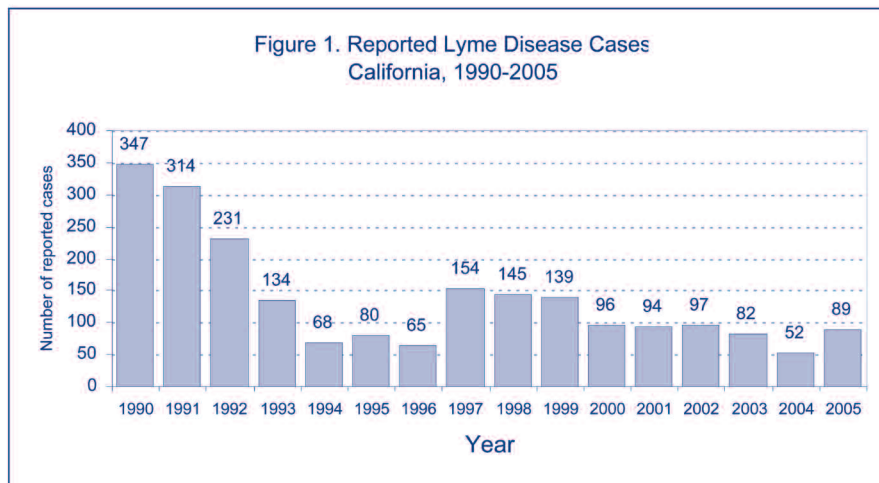
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## Lyme Disease...from page 1

The number of LD cases reported in California has varied considerably—from 347 cases in 1990 to 89 in 2005 (Figure 1). The large number of LD cases reported in 1990 may reflect a period where there was greater awareness, and greater reporting. In general, there has been a declining trend in reported cases statewide with the exception of 2005—the number of cases nearly doubled from 49 in 2004 to 89 in 2005. This is likely due to the recent addition of LD to the list of laboratory reportable diseases. Each year in Los Angeles County, between 20 and 30 suspected LD cases are reported to Public Health. However, few of these reports meet the Centers for Disease Control and Prevention (CDC) and definition for confirmed LD. The number of confirmed LD cases in Los Angeles County has ranged from zero to eight cases a year. In 2005, eight cases were identified. From 1995 through 2004, the Los Angeles County incidence of LD was estimated at 0.05 per 100,000 persons—equivalent to one case for every 2 million Angelinos per year [4]. In contrast, the incidence in Connecticut in 2003 was 40.28 per 100,000 [1].

Figure 1. Reported Lyme Disease Cases  
California, 1990-2005



Despite the low incidence in southern California, LD remains an important disease for health care providers to understand. First, most Los Angeles County cases occur in patients who have been exposed outside of the county—northeastern U.S. in particular. In addition, for patients residing in low risk areas, like our county, incorrect diagnosis and treatment can often occur. In order to appropriately diagnose and treat patients in a timely manner, healthcare providers should be knowledgeable of the variable transmission risk of LD in their localities, and understand the signs and symptoms associated with LD and laboratory tests needed to confirm a clinical diagnosis.

## Lyme Disease Risk of Transmission is Highly Variable

In much of the western U.S. including Los Angeles County, LD is transmitted to humans by both the nymphal and adult forms of the western blacklegged tick, *Ixodes pacificus*. Field studies have shown that less than 10% of adult *I. pacificus* ticks in California are infected with *B. burgdorferi*—in contrast, more than 50% of *I. scapularis* ticks, the tick responsible for LD infection in northeastern U.S., are infected with *B. burgdorferi* [5]. On the other

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**Since nearly all Lyme disease cases in Los Angeles County reported tick exposure from the northeastern U.S., it is especially important that clinicians inquire about travel history during diagnosis.**

hand, in parts of Northern California, the percentage of infected nymphs have ranged from 0–41%, with the highest rates of infection being found in Mendocino and Sonoma counties [5,6]. This variation in the proportion of infected nymphal and adult ticks will lead to variable transmission risks. And more importantly, since nearly all LD cases in Los Angeles County reported tick exposure from northeastern U.S., it is critical that clinicians inquire about travel history when diagnosing LD.

### **Lyme Disease Signs and Symptoms Occur in Multiple Stages**

The clinical presentation of LD depends on the stage of illness. The most common clinical presentation is the distinctive rash of erythema migrans, or EM, that usually appears at the site of the bite within 3–32 days of a tick bite exposure. EM resembles a rapidly expanding red bull's eye and occurs in 60–90% of patients. If there is no rash, other early symptoms such as fever, body aches, headaches, and fatigue can occur but are nonspecific and often unrecognized as indicators of LD. If untreated, within weeks to months after the onset of EM, neurologic symptoms such as aseptic meningitis and cranial neuritis may develop. Within weeks to years, pain and swelling of the large joints may develop and chronic arthritis may occasionally result [7]. Even with treatment, many patients report a “post-infectious syndrome” characterized by fatigue, arthralgias, and mood and memory disturbances. The effect of these chronic symptoms on quality of life has been shown to be equivalent to or greater than that of common chronic diseases such as osteoporosis and type-2 diabetes [8].

### **Laboratory Tests for Lyme Disease Can be Unreliable**

Because EM's circular rash is unique to LD and can be distinguished from many of LD's nonspecific signs,

its presentation precludes the need for further testing. For purposes of surveillance, CDC requires a confirmed case of LD to have documented EM that is at least 5cm in diameter or at least one late manifestation of LD diagnosed by a health provider and supporting laboratory studies. Many reported cases do not meet the CDC case definition because laboratory tests are often ordered for patients with vague symptoms not consistent with the CDC case definition. Additionally, laboratory diagnostic tests are often inaccurate in diagnosing LD either because they cannot reliably detect the infection early in the course of disease or they can be interpreted incorrectly. Serodiagnostic tests, for example, cannot detect LD during the first several weeks of infection because there is no antibody response until at least 4 weeks after infection [5]. Both false-negative and false positive results have been well documented at less than 4–6 weeks post infection [5].

Because laboratory tests are often inaccurate, diagnosis of LD should be based primarily on clinical presentation—particularly EM, and history of tick exposure. Serology results should be used to support the diagnosis rather than confirm a LD diagnosis. If indicated, the CDC, Food and Drug Administration, the Association of State and Territorial Public Health Laboratory Directors, and the American College of Physicians currently recommend a two-step serologic testing procedure for LD: an initial enzyme immunoassay (EIA) or immunofluorescent antibody (IFA) screening test, and if positive or equivocal, followed by IgM and IgG Western immunoblotting [5].

### **Over Treatment Can Cause Increased Morbidity**

LD can easily be treated with antibiotics. If treated in the early stage, a short course of an oral antibiotic such as doxycycline has proven to be highly effective, while later stages will require longer treatment with either oral or intravenous antibiotics. However, prolonged use and indiscriminate prescription of antibiotics for vague symptoms that are often confused with late stage LD, or even for a tick bite exposure without supporting symptoms, can cause unnecessary antibiotic use and morbidity. This could include adverse drug reactions and secondary bacterial sepsis such as from an indwelling catheter [5]. Furthermore, a clinical trial showed that prolonged courses of antibiotic treatment did not improve persistent symptoms of LD compared to no treatment at all [8].

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## Prevention of Tick Exposure is Key

Since the LYMErix vaccine was removed from the market in February 2002, a vaccine is no longer available for Lyme disease—thus it is now more important than ever that physicians encourage their patients to take preventative measures. The risk of acquiring infection with the spirochete *B. burgdorferi* increases when the tick has attached to the body for at least 24 hours. Tips for avoiding exposure to tick bites include:\*

- Check your body regularly for ticks, and if found, remove them promptly and correctly.
- When outdoors, wear light colored clothing so that ticks can be easily seen.
- To avoid being bitten by ticks, wear long pants and long-sleeved shirts and tuck pants into boots or socks, and tuck shirts into pants.
- Use tick repellent and treat clothing with products containing permethrin.\*\*
- When hiking, stay in the middle of trails to avoid contact with bushes and grasses where ticks are most common.
- Check for and control ticks on pets.

\* Adapted from CADHS: <http://www.dhs.ca.gov/ps/dcdc/disb/disbindex.htm>

\*\* Additional information on insect repellents at:

<http://www.cdc.gov/ncidod/dvbid/westnile/resources/uprepinfo.pdf>

### Lyme disease in pets

Of the domestic animals, LD is diagnosed most often in dogs.

In dogs, lameness, fever, anorexia, lethargy, and lymphadenopathy with or without swollen, painful joints are part of the common clinical syndrome. The clinical skin lesion of EM is not seen in dogs, probably due to the fact the body is covered with hair.

When dogs are taken to high risk areas, such as Northern California, veterinarians recommend that they be vaccinated. Keeping dogs free of ticks in the foothills is difficult, particularly if they roam. Two doses of vaccine are administered at three week intervals. ☞

### Additional information on Lyme disease is available from:

- CDC

<http://www.cdc.gov/ncidod/dvbid/lyme/index.htm>

- Los Angeles County DPH

<http://lapublichealth.org/acd/vectorlyme.htm>

- National Institutes of Health

<http://www.niaid.nih.gov/publications/tick.htm>

- U.S. Armed Forces

<http://chppmwww.apgea.army.mil/ento/TickEd.htm>

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### Van Ngo M.P.H

Epidemiology Analyst, Acute Communicable Disease Control

### Rachel Civen, M.D., M.P.H

Medical Epidemiologist, Acute Communicable Disease Control

## Care for Rattlesnake Bites...from page 1

Non-poisonous wild snakes in Southern California have round pupils. In general, it's best not to use any of these techniques to confirm the identity of a snake on your own. Numerous bites occur as a result of this very curiosity. In terms of medical care, observation of the patient for progression of signs and symptoms is enough to tell the story. Further, it is not necessary to know the species of rattlesnake; virtually all rattlesnake envenomations are handled the same way.

### What should your patients do immediately after a rattlesnake bite?

The most important thing to do is not to panic. Rattlesnake envenomations are slowly progressing injuries and rarely fatal. First aid is simple:

- 1) gently wash the bite site with water and soap if available,
- 2) elevate the affected extremity above the level of the heart, and
- 3) get to the nearest emergency facility as soon as possible.

### More important is what not to do.

- DO NOT pack the wound in ice
- DO NOT apply a tourniquet or constricting band
- DO NOT cut or slice the wound with any instrument
- DO NOT apply suction to the wound with your mouth or any device
- DO NOT apply open flame to the wound
- DO NOT apply electricity to the wound

Table 1

Even though healthcare providers, major health organizations, and the Boy Scouts of America have advised each of the following treatment in the table above, none of these treatments improve the outcome of snakebites. In fact they have ALL been shown to make matters worse.

A "Snakebite Kit" commonly contains items to accomplish many of these treatments: a scalpel, a tourniquet, and a suction extractor. It is not advisable to purchase or carry such a kit. *The most valuable "First Aid Kit" to have with you is a mobile phone, to call 9-1-1 Emergency Services.*

### What are the symptoms of a rattlesnake envenomation?

The victim will first experience stinging and burning at the site of the bite. Symptoms often progress over the next several hours to nausea, vomiting, sweating, numbness and tingling (sometimes in places remote from the bite site), and mildly increased heart rate and blood pressure. Progressive, painful swelling of the affected extremity ensues.

### Laboratory evaluation of a patient with rattlesnake envenomation

Hematological abnormalities are common, with marked decreases in platelets and fibrinogen, and elevations in prothrombin time (PT) and partial thromboplastin time (PTT). These laboratory indices initially suggest that the patient has disseminated intravascular coagulation (DIC); however, the peripheral smear evaluation reveals no microangiopathic hemolytic process (the defining feature of DIC). The components of rattlesnake venom yield a "positive DIC panel" by alternate mechanisms. Therefore, snakebite patients do not generally require administration of blood products. In fact, when blood products are given to patients, they result in no change in coagulations parameters. On rare occasion, when the snake's fangs manage to pierce through a major artery or vein, the patient may experience a rapid progression of symptoms, including true disseminated intravascular coagulation and spontaneous bleeding. These patients are treated symptomatically, with blood products and antivenom.

### How do you treat a patient with rattlesnake envenomation?

*Call the California Poison Control System (1-800-222-1222).* Experts in medical toxicology and poison information are on hand 24/7 to provide you with up-to-date, minute-to-minute guidelines to suit your patient's clinical scenario. In general, patients are assessed for progression of swelling and laboratory evidence of coagulation abnormalities, suggesting the need to administer rattlesnake antivenom. Antivenom is administered until the swelling and laboratory abnormalities are controlled. Supportive care is paramount, which includes close observation, elevation of the extremity above the level of the heart, and pain control (often with narcotics). Some patients may experience fasciculations, which may be relieved by benzodiazepines. A typical hospitalization is 2-3 days, however severe cases may require longer stays.

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## Care for Rattlesnake Bites...from page 5

### What are some myths about rattlesnakes and management of envenomations?

- 1) **Myth:** Snake bites require treatment with antibiotics  
**Truth:** Rattlesnakes do not carry bacteria in their mouths so routine use of antibiotics after envenomation is unnecessary.
- 2) **Myth:** Baby rattlesnakes are more dangerous  
**Truth:** So-called “Baby Rattlesnakes” are not characteristically more dangerous than more mature rattlesnakes because they produce less venom overall.
3. **Myth:** Snake bites require surgical intervention  
**Truth:** Surgical intervention with fasciotomy is almost never indicated in rattlesnake envenomation.

The affected extremity may feel quite tense, with diminished palpable pulses, giving the appearance of a compartment syndrome. Despite the ominous appearance, compartment pressures are usually normal because envenomations are subcutaneous injuries. Studies confirm that supportive care and the further administration of antivenom produces better clinical outcomes than surgical fasciotomy. ☞

**Cyrus Rangan M.D., FAAP, ACMT**

Director, Toxics Epidemiology Program

## Trauma Season

### Summer is peak injury and fatality season for County’s children

National and local data confirm the warmer and summer months increase the risk of childhood injury, likely due to increased exposure to outdoor activities such as swimming, biking, playing outdoors and motor vehicle travel.

During the summer, children spend more of their time outdoors often with minimal “active” adult supervision and improper use of safety equipment, which increases their risk of injury and even death.

In 2001, a national study on the seasonality of unintentional childhood injury found that 42% of all unintentional injury related deaths and 39.9% of all unintentional injury related hospitalizations among children ages 14 and under occurred during the summer months of June, July and August (Table 1). The study also found that 66.1% of drowning, 52.5% of bicycle, 49.2% of falls, 40.8% of pedestrian, and 40.3% of motor vehicle occupant related fatalities occurred during these months (Table 2).

	National	LA County
<b>Deaths</b>	42	50.9
<b>Hospitalizations</b>	39.9	40

**Table 1:** Percent of unintentional injury deaths and hospitalizations Among children 14 and under during summer months in the U.S. and Los Angeles County

In Los Angeles County a similar pattern exists with 51% of all unintentional injury related deaths and 40% of all unintentional injury related hospitalizations among children ages 14 and under occurring during the summer (Table 1). Further trends in the County suggest 72% of drowning, 56% of bicycle, 41% of pedestrian, and 38% of motor vehicles occupant fatalities occur during summer months among these children (Table 2).

	National	LA County
<b>Drowning</b>	66.1	72
<b>Bicycle</b>	52.5	56
<b>Fall</b>	49.2	*
<b>Pedestrian</b>	40.8	41
<b>Motor Vehicle Occupant</b>	40.3	38

**Table 2:** Percent of unintentional injury deaths among children 14 and under by mechanism during summer months in the U.S.

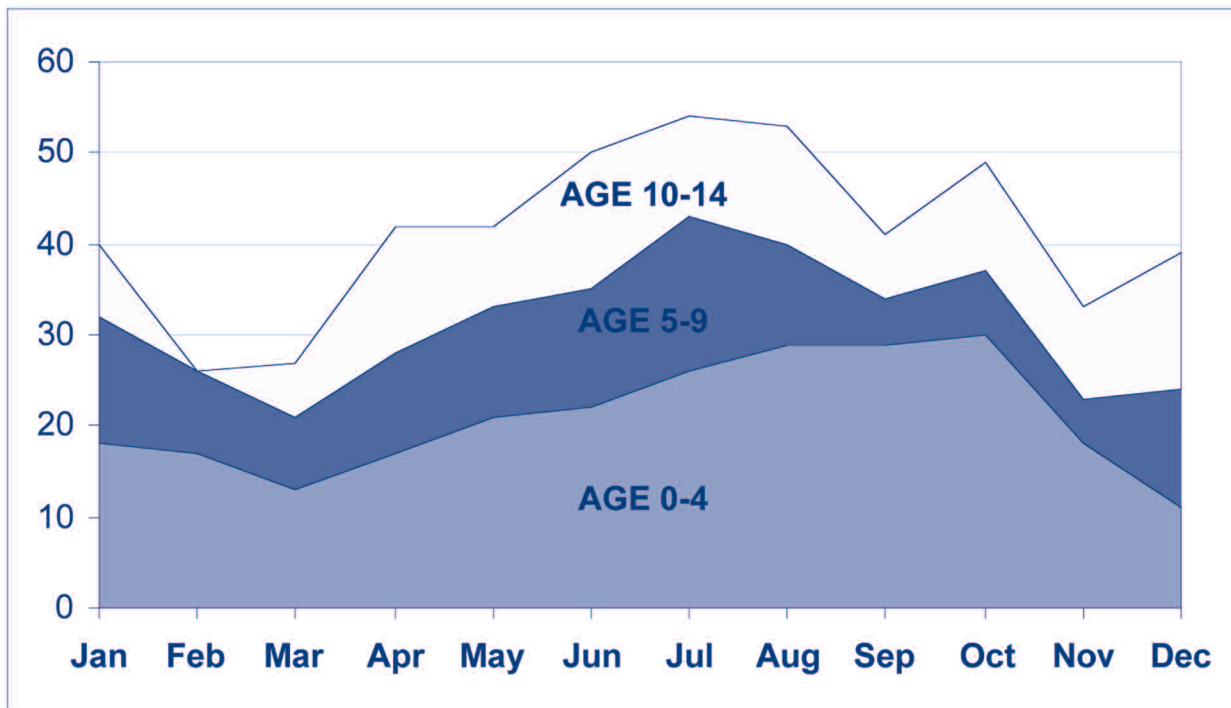
And Los Angeles County

\*Only “1” fatality reported during summer

When comparing specific age categories of children, ages 0-4, 5-9, and 10-14, in Los Angeles County a similar pattern among each group is observed suggesting an increase of summertime injury-related deaths compared to those throughout the year (Figure 1). In Los Angeles County, between the years 1999-2003, 40% of infants and toddlers between the ages of 0-4; 44% of ages 5-9; and 45% of children 10-14 were killed between the months of May through August due to unintentional injuries. More

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## Trauma Season...from page 6



**Figure 1: Distribution of unintentional injury deaths among children by Age Category, Los Angeles County, 1999-2003**

specifically in the 10-14 age range, warmer additional months seem to have an affect, as observed as early as April and in October (Figure 1).

### Water Safety

Ninety percent of children who have drowned were actually being supervised by an adult at the time of the drowning. These adults were distracted by talking on the phone, reading, eating, or even sleeping while watching the children nearby the pool. This is where “active” supervision is important, where the adult keeps their eyes on those in the pool and pool area similarly as a lifeguard would. Infants and toddler aged children are at most risk and parents/caregivers of these children who visit homes with pools or those who have their own pools must take caution.

### Bicycle Safety

California law requires children under the age of eighteen to wear approved safety helmets when riding bicycles, scooters, skateboards and skates. Wearing a helmet correctly is essential for effectiveness. Many children wear their helmet incorrectly, tilted back on their head like a hat. Generally in a bicycle collision, the rider

falls forward, and in this case of the helmet worn tilted back, exposes the prefrontal cortex, and upon impact, increases the risk of traumatic brain injury. When the helmet is worn flat on the head and is fastened snugly, during a forward collision the cortex is protected. When riding skateboards and in-line and roller skates, in addition to a helmet, elbow and knee pads, and wrist guards are also recommended. For those riding scooters, in addition to the helmet it is recommended the rider also wear elbow and knee pads for protection.

### Motor Vehicle Safety

California Child Passenger Safety Law requires children to be properly secured in a child seat or booster seat until they are at least 6-years old or weighing at least 60-pounds. For children between 6 and 16-years old or 60-pounds, it is required that they ride in a: 1) child restraint system (car seat, booster, harness, or other product certified to meet Federal Safety Standards), or 2) Be properly fitted in a safety belt (lap belt that lays flat on the lap and a shoulder belt that fits against the shoulder, and not under the arm or behind their back). Riding unrestrained is the greatest risk factor for motor vehicle occupant injury fatality.

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# Trauma Season...from page 7

## A Guide to Summer Safety

	Contributing Trauma Factors	Protective Factors
<b>Water Safety</b>	<ul style="list-style-type: none"> <li>• Warm Weather</li> <li>• Private pools/spas</li> <li>• Child wading/inflatable pools</li> <li>• Lack of perimeter fencing &amp; self closing/self latching gates</li> <li>• Lack of fence &amp; gate maintenance</li> <li>• Lack of “active “supervision</li> <li>• Lack of CPR and swimming ability among pool supervisors</li> <li>• Lack of lifesaving equipment at pool side</li> </ul>	<ul style="list-style-type: none"> <li>• “Active” supervision</li> <li>• CPR &amp; swimming lessons for pool owners, supervisors, and children 5 years and older</li> <li>• Perimeter fencing (5’ or greater)</li> <li>• Self-closing/self-latching gates (open outward)</li> <li>• Locks and alarms on all windows and doors that lead to the pool/spa area</li> <li>• Smaller wading pools, empty and turn up-side down after each use</li> <li>• Large inflatable pools-check local fencing/electrical requirements ( see yellow pages under “city planning department” for the city or county you live in.</li> </ul>
<b>Safety Bicycle</b>	<ul style="list-style-type: none"> <li>• Not wearing a helmet</li> <li>• Not wearing a helmet fastened or correctly</li> <li>• Not following rules of the road or bike path safety rules</li> </ul>	<ul style="list-style-type: none"> <li>• Always wear an approved helmet-“It’s a California Law for those &lt;18”</li> <li>• Always wear the helmet flat on the head</li> <li>• Always fasten the helmet so it fits snugly</li> </ul>
<b>Pedestrian Safety</b>	<ul style="list-style-type: none"> <li>• Not obeying pedestrian traffic lights</li> <li>• Crossing at mid-block</li> <li>• Not using crosswalks with crossing guards</li> <li>• Children under the age of 12 at most risk</li> </ul>	<ul style="list-style-type: none"> <li>• Obey pedestrian traffic lights</li> <li>• Use of crosswalks with crossing guards</li> <li>• Children 12 and under walking only with an adult</li> <li>• Look left, right, then left again before crossing</li> <li>• Make eye contact with the driver of a vehicle before crossing the street</li> <li>• Be aware that cars and delivery trucks can be backing from a blind driveway or alley when crossing a sidewalk.</li> </ul>
<b>Motor Vehicle Occupant Safety</b>	<ul style="list-style-type: none"> <li>• Riding improperly restrained in a child safety seat, booster, or vehicle seat</li> <li>• Not following <u>both</u> the safety seat <u>and</u> vehicle manufacture installation instructions, prior to installing a child safety seat or booster seat</li> <li>• Leaving a child alone in a vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Following <u>both</u> the safety seat <u>and</u> vehicle manufacturer installation instructions, prior to installing a child safety seat or booster seat</li> <li>• Have the seat inspected by calling 1-866-732-8243 to have your child safety seat or booster seat inspected in your area</li> <li>• Never leave a child alone in a vehicle for any reason-It’s a California Law</li> </ul>
<b>Fun in the Sun Safety</b>	<ul style="list-style-type: none"> <li>• Unprotected skin</li> <li>• Dehydration</li> <li>• Exhaustion</li> <li>• Excessive exposure to heat &amp; poor air quality</li> </ul>	<ul style="list-style-type: none"> <li>• Visit the “Seasonal Safety” section of the Injury &amp; Violence Prevention website at <a href="http://www.lapublichealth.org">www.lapublichealth.org</a></li> </ul>

For additional information visit [www.lapublichealth.org](http://www.lapublichealth.org) or call (213) 351-7888



# Trauma Season...from page 8

for motor vehicle occupant injury fatality.

## Falls-Playground Safety

While many injuries are associated with inadequate supervision on playgrounds, parents should become proactive in playground supervision. Although adults and parents are not expected to be inspectors on playgrounds, they should also visually inspect the equipment for potential safety problems.

## Pedestrian Safety

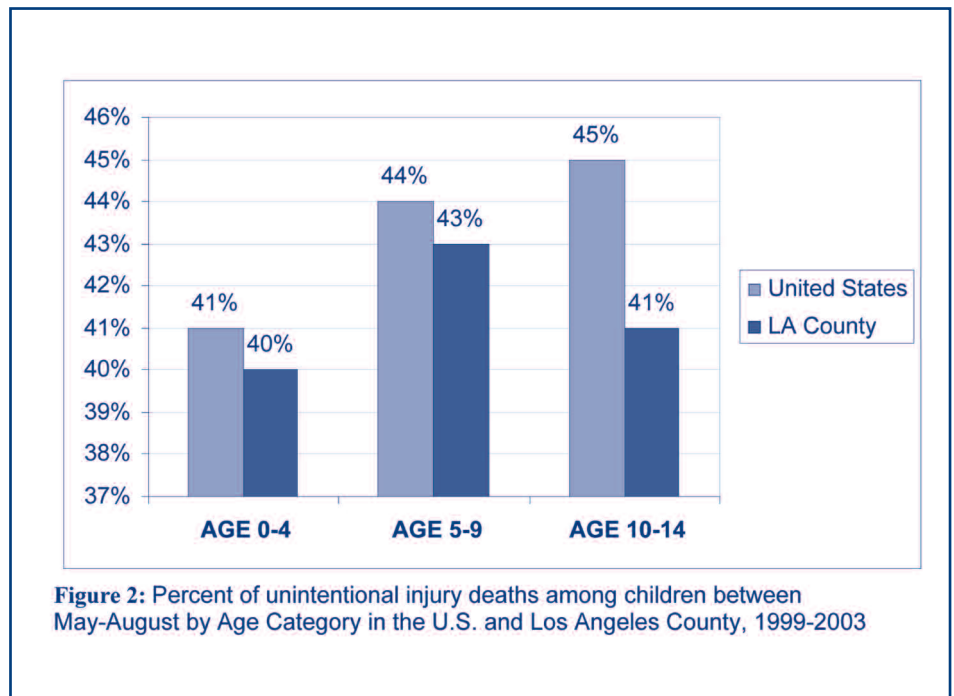
While children under the age of 12 are at risk for death and hospitalization due to pedestrian injury, the risk decreases as the child gets older and their coordination skills develop. These children should never walk alone. Parents and caregivers should also remember that since children learn by observing their behaviors they must model safe pedestrian behavior. These include: crossing at corners, obeying pedestrian signals and using crosswalks when possible.

## Babysitting Safety

While many teens work during the summer as babysitters, it is necessary that they have appropriate safety skills. Many local police departments have safety tips for babysitters. The health department also has safety tips for download at [www.lapublichealth.org](http://www.lapublichealth.org) or these can be mailed by calling the Injury and Violence Prevention Program at (213)351-7888.

## Safety in the Sun

Outdoor activities can expose children to skin damage from the sun, even on cloudy days. Heat stress is also a hazard. Babies less than 6 months of age should avoid sun exposure and be dressed in lightweight long pants and long-sleeved shirt and a brimmed hat to prevent sunburn, according to the American Academy of Pediatrics. For older children, sunscreen with a SPF of at least 15 should be applied at least 30-minutes before going outdoors and reapply as directed, especially after swimming or sweating. A hat, sunglasses that block 99-100% of ultraviolet rays,



and cotton or sun protective clothing to cover as much skin as possible should be worn.

Children are also more susceptible to dehydration and heat illness than adults. Children should drink at least 12 ounces of non-carbonated, non-caffeinated fluid 30 minutes before activity begins and during the activity. Children under 90 pounds should drink 5 ounces every 20-minutes and after activity, children should drink another 5 ounces every 20-minutes during the first hour to make up for fluid loss.

For additional information on Safety in the Sun, physicians can refer patients to the seasonal safety section of the Injury & Violence Prevention website at <http://lapublichealth.org/ivpp/SeasonalSafety/seasonalsafetyHome.htm> ☞

## James M. DeCarli, MPH, MPA, CHES,

Research Analyst III/Behavioral Sciences,  
Injury & Violence Prevention Program

# Beware of Drug Interactions with Anti-TB Agents

It is well known that Los Angeles County has experienced a decline in the total number of Tuberculosis (TB) cases. However, due to the increasing prevalence of co-morbid medical diseases and drug resistance, it can be said that this decline is tempered somewhat by the increasing complexity of the cases treated. This fact is illustrated in the following case histories below:

- A 65-year-old woman is admitted to a teaching hospital for fever and possible acute rejection of her liver transplant. Her chest radiograph (CXR) shows apical opacification and a pleural effusion. Although sputa smears for acid-fast bacilli (AFB) are negative, analysis of her pleural fluid is consistent with a lymphocytic exudate. She is started empirically on rifampin (RIF) and ethambutol (EMB), and moxifloxacin (MOX) for a presumptive diagnosis of tuberculosis and continued on mycophenolate, cyclosporine, and prednisolone.
- A 53-year-old man is admitted to a private hospital's ICU for fever of 102° F and respiratory failure. CXR is abnormal, and AFB smears of stool specimens are positive. His medical history is significant for diabetes mellitus, hypertension, renal failure, and kidney transplant several years ago. He is started on parenteral isoniazid (INH), RIF, and levofloxacin (LEV) for possible TB disease. His other medications include tacrolimus and methyprednisolone.
- A 49-year-old man is admitted to the hospital for respiratory failure and "pneumonia." CXR is noted to show an infiltrate in the left lower lung field. Sputa smears are negative for AFB, but cultures grow *M. tuberculosis*. The patient is started on INH, RIF, EMB, and pyrazinamide. The patient is also noted to be on warfarin for deep venous thrombosis.

In reviewing the case histories, did you note the potential drug-drug interactions? The aforementioned medical histories prompted calls from physicians of the Tuberculosis Control Program to the patients' doctors because all of these patients were at risk for serious complications due to medication interactions.

RIF is a powerful bactericidal agent that forms the backbone of anti-TB regimens. However, it is a potent inducer of cytochrome P450, an enzyme system that metabolizes numerous medications [1]. By accelerating their metabolism, RIF can drastically lower the levels, and thus the efficacy, of many drugs including anti-retroviral agents (e.g., protease inhibitors), cardiac anti-arrhythmics (e.g., amiodarone), anti-convulsants (e.g., phenytoin), and immunosuppressive agents. In the cases described above, patients could have been at risk for rejection of their organ transplants, serious cardiac arrhythmias, and blood clots due to drug interactions with RIF. Rifabutin (a rifamycin related to RIF) can also induce cytochrome P450, though to a lesser degree.

Physicians, pharmacists, and other healthcare providers need to be aware of the serious drug interactions that can occur with RIF. Electronic systems capable of automatically detecting such interactions may be one way to avoid adverse treatment outcomes.

Note: While clinicians sometimes choose to include a quinolone such as MOX and LEV into anti-TB regimens, these drugs are not first-line antimycobacterial agents and much remains unknown regarding their ability to eradicate TB organisms and their effect on the duration of therapy. ☞

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## References:

1. Li A, Reith M, Rasmussen A, et al. Primary human hepatocytes as a tool for the evaluation of structure-activity relationship in cytochrome P450 induction potential of xenobiotics: evaluation of rifampin, rifapentine, rifabutin. *Chemico-Biological Interactions* 1997;107:17-30.

## Annette Nitta, MD

Director, TB Control Program

# Physicians Help Medically Vulnerable Prepare for Disasters

Which patient is "medically vulnerable" in a disaster? In the context of a natural or man-made disaster, this is the patient who, by virtue of chronic medical problems and perhaps social isolation, faces an increased risk of adverse medical outcome due to interruption of usual life-sustaining or other medical care during and following a disaster. All physicians can identify patients in their practice who fit this description.

**Special medical needs individuals include those with chronic illnesses requiring ongoing medical visits, medication, and other treatments. Their personal physician is in the best position to help each individual prepare for the inevitability of natural and man-made disasters and the disruption they bring, based upon the physician's training and unique knowledge about a given patient.**

As recent natural and man-made disasters have shown, individuals with special medical needs are at greatly increased risk for poor outcomes when their usual sources of medical care, supplies, and transportation are suddenly and unexpectedly gone. All of us still remember the disturbing images of suffering and loss broadcast in the aftermath of Hurricanes Katrina and Rita. And we all know that preparing for such disasters is our only way to minimize such damage.

Federal, state, and local governments have a key role in development of disaster plans for communities. However, individuals with special medical needs may not have adequate preparation under more general disaster planning. Some questions arise: what should the rest of us do to help those with special needs be as prepared as possible? Who is in the best position to identify special medical needs individuals? Who is in the best position to help these individuals become prepared for future disasters?

Each personal physician knows the diagnoses of their patient's as well as the patient's existing social support. The physician may have regular visits with the patient, and so have multiple opportunities to deliver brief, focused, and effective messages about emergency preparedness. Most importantly, the personal physician is one of the most trusted and authoritative persons in the

lives of many patients. Thus, he or she is the one best able to deliver disaster information and advice for those with special medical needs.

Los Angeles County Public Health recommends that each physician, at each clinic visit, review the following:

## **Does the patient have a personal disaster plan, including:**

1. At least one "buddy" who lives nearby and who knows in advance to check in on the patient in the event of an emergency?
2. A phone list of all emergency phone numbers (personal physician, nearest emergency rooms, fire, police, pharmacies)?
3. At least one week's supply of non-perishable emergency food and water?
4. At least one or two weeks supply of any prescription medications on hand?
5. A wallet-sized list of diagnoses and medications?

**In summary:** a patient's personal physician may be the one best person in the medically vulnerable patient's life who can help insure that the patient be as well-prepared for a medical emergency as they can be. The health department encourages each physician to review the above disaster preparedness issues with each of their medically vulnerable populations at each clinic visit. ☞

## **Keith Campeau, MD, MPH**

Area Medical Director SPA 1  
Community Health Services

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# The Los Angeles-Orange Immunization Network (LINK):

## Getting to Know Your Local Immunization Registry

### What are immunization registries?

Immunization registries are confidential web-based information systems that maintain centralized electronic immunization records across multiple providers. They enable providers to track and update patients' immunization records, assess which vaccinations are due at each visit, and identify patients who should be sent immunization reminder notices. Immunization registries can help improve the delivery of immunization services and increase vaccination coverage rates within communities. Healthy People 2010 has set a national goal of enrolling 95% of children from birth through age 5 years in a fully functioning registry. All fifty states, and all counties in California, are participating in immunization registries.

### Why are immunization registries important?

An increasingly complex childhood immunization schedule can make it difficult for health professionals to assess patients' vaccination needs, and as families move or change healthcare providers, immunization records are often difficult to keep up-to-date. By maintaining updated immunization records and providing useful tools, such as automated reminder notices and vaccine management, registries can improve the delivery of immunization services and decrease rates of under- and over-immunization. Immunization registries are also

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Los Angeles-Orange Immunization Network

important to help prepare for and respond to public health emergencies and natural disasters. The benefits of immunization registries were recently made clear in the aftermath of Hurricane Katrina, when several state registries were quickly able to provide critical immunization information for families forced to relocate to other states.

### LINK: Your local immunization registry

The Los Angeles-Orange Immunization Network (LINK) is the regional registry currently in use in Los Angeles and Orange counties. LINK was originally formed in 2000 as a partnership between three health departments in Los Angeles County—the Los Angeles County Department of Health Services (LACDHS), the City of Pasadena Public Health Department, and the City of Long Beach Department of Health and Human Services and was called the Los Angeles Immunization Network. In October 2004, the Orange County Health Care Agency joined LINK, expanding the LINK region into Orange County and changing its name to the Los Angeles-Orange Immunization Network. LINK is one of nine regional registries operating in California, all of which will be linked electronically by 2008. This will enable participating providers to access immunization records for children who have moved anywhere within the state of California.

Since LINK was implemented in 2002, approximately 350,000 individuals have been entered into the registry. To date, 226 providers are using LINK: 43 public health department-based clinics, 95 community-based clinics, 69 private providers, 9 school-based clinics, 3 schools, 1 college-based clinic, 5 WIC sites, and 1 health department Foster Care office. With new providers joining and more records being entered

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# Immunization Network...from page 12

every day, LINK's goal is to have over 1,500 providers using LINK and over one million children's immunization records in LINK by 2010.

## How does LINK work?

With the click of a button, agencies approved to use LINK are directed to LINK's web login screen, where they can sign on with a unique ID and password and instantly search for a patient within thousands of immunization records. Once logged in, users can review and update a patient's immunization history, and record any shots they give. LINK has several other notable features including:

- A quick search screen to look up any child or adult within the registry;
- Automatic forecasting of vaccinations that are due based on the most up-to-date immunization recommendations;
- Tracking of adverse events and contraindications;

- Automatic generation of reminder/recall postcards based on upcoming or overdue shots;
- Vaccine inventory tracking and management;
- Generation of patient- and clinic-level reports; and
- Automatic printing of the official patient immunization record (yellow card) and school immunization record (blue card) electronically filled with the most current immunization history.

LINK includes a variety of tools that make it easy for participating healthcare providers and other users to implement the registry in their practice. LINK staff work closely with each participating agency to ensure that LINK is seamlessly integrated with their existing procedures and adds the most value to their work environment.

## Who can use LINK and how?

The California Health and Safety Code (H&S Code Section 120440) gives legal authority to registries and currently authorizes health care providers, schools, day care facilities, WIC, CalWORKs, county/state foster programs, and health plans to access registries for the purposes of providing immunizations, conducting assessment and referral, and determining school/program entry. Each participating agency is required to enter into a Memorandum of Understanding with LINK and each user must sign a User Confidentiality Agreement. To access LINK, users must have a computer terminal, Internet access, and Internet Explorer browser software.

Access to LINK, training and help desk services are provided free to participating providers.

To find out more about LINK, or to learn how to participate, please contact the LINK Help Desk at 213-351-7411. ☎

**Robyn Davis, MPH**  
Regional Manager, LINK  
Immunization Program

**IMMUNIZATION RECORD**  
Comprobante de Inmunización

CAIR ID#: 109432 Med Rec#: Page: 1

Name: Sam Sample  
Birthdate: 9/1/2005 Sex: M

Vaccine Reactions: None  
Allergies: None

**Pt Name: Sample, Sam ID#: 109432 Med#:**

The following immunizations are due or could be given today (4/24/2006):

- > ROTAVIRU 1 11/01/2005:
- > HIB 2 01/03/2006:
- > PNUcon 2 01/03/2006:
- > FLU 1 03/01/2006:

**Give These ...**

- \_\_\_ Polio (IPV / OPV) \_\_\_ PNUcon
- \_\_\_ DTaP/DT/Td/ \_\_\_ HAV
- \_\_\_ HepB \_\_\_ Varicella
- \_\_\_ Hib \_\_\_ PPD
- \_\_\_ MMR \_\_\_ Other

Prov. Authorization: \_\_\_\_\_  
Reactions: \_\_\_\_\_  
Risks: \_\_\_\_\_  
Waivers: \_\_\_\_\_

Patient's Immunization History:

(K) Vaccine	Group	(#)	Date Recv.	Age	Provider
IPV	POLIO	1	11/03/2005	0y 2m 2d	TRANSCRIBED
+ DTaPHIBIP	POLIO	2	04/23/2006	0y 7m 22d	MAIN
DTaP	DTP	1	11/03/2005	0y 2m 2d	TRANSCRIBED
+ DTaPHIBIP	DTP	2	04/23/2006	0y 7m 22d	MAIN
+ HIB-HBV	HIB	1	11/03/2005	0y 2m 2d	TRANSCRIBED
+ HIB-HBV	HEPB	1	11/03/2005	0y 2m 2d	TRANSCRIBED
+ DTaPHIBIP	HEPB	2	04/23/2006	0y 7m 22d	MAIN
PNUcon	PNUcon	1	11/03/2005	0y 2m 2d	TRANSCRIBED

\* Reaction to that vaccine: \_\_\_\_\_  
- Vaccination has been archived (by: MAIN/ladhs)  
+ Combination vaccine appears on list twice 4/24/2006

Printed For: Main Street Clinic  
(by: MAIN/ladhs)

ROTAVIRU \_\_\_\_\_  
HIB \_\_\_\_\_  
PNUcon \_\_\_\_\_  
FLU \_\_\_\_\_

Authorizing Signature \_\_\_\_\_

# National STD Conference Features Local Research and Programming, Part One\*.

The Los Angeles County STD program staff presented numerous presentations and posters at the recent 2006 National STD Prevention Conference. The theme was "Beyond The Hidden Epidemic: Evolution or Revolution?" Complete abstracts can be found at <http://www.lapublichealth.org/std/>. The following are summaries:

## **The effect of a cervical high-risk human papillomavirus (HR-HPV) diagnosis on women's sexuality in Los Angeles.** *B Amani, PM Gorbach, A Shin, R.D. Cranston, J St. Lawrence, PR Kerndt.*

Little is known about how sexual behaviors of minority women and their partners affect risk for high-risk human papillomavirus (HR-HPV). 1,771 African American (AA), Asian (AS) and Latina (L) women were tested for HR-HPV using Hybrid Capture 2 DNA test and interviewed about risk behaviors. Associations between HR-HPV infection and women's reports of their and their partners' sexual relationships were examined using Chi-square analysis, t-tests and logistic regression. Findings suggest differences in sexual behaviors among minority women and their partners may affect their risk for HR-HPV. Understanding of different sexual and racial/ethnic correlates of high risk HR-HPV is needed to develop appropriate counseling messages and risk reduction behaviors.

## **Where do we stand five years into the epidemic? Level of risk taking behaviors and HIV seroprevalence among early syphilis cases in Los Angeles, 2001 to 2005.** *G Aynalem, LV Smith, PR Kerndt.*

Despite rapidly instituted outbreak control efforts, prevalence of syphilis in the county remains high especially among MSM, many of whom are also HIV positive. Trends in HIV seroprevalence and risk behaviors and their deviation from a zero slope was assessed for a six month interval. Differences in HIV seroprevalence and high-risk behaviors between MSM and heterosexual early syphilis cases were assessed. Five years into the epidemic, lack of substantial reduction in high risk behaviors like anonymous sex and condom non-use and HIV co-infection among early syphilis cases underscore the need for more effective prevention and risk reduction efforts. Continued monitoring of risk behaviors among those who are reported with STDs is critical for evaluating trends in sexual practices and the impact of prevention efforts.

## **Variation in sexual "marketplace" by race/ethnicity, age and sexual orientation among early syphilis case: Implication for prevention strategies.** *G Aynalem, LV Smith, PR Kerndt.*

As a basis for prevention efforts, it is essential to understand the "sexual marketplace" or venues used to identify sexual partnership of those at risk of acquisition and/or transmission of STDs.

The different venues used for sexual encounter by age, race/ethnicity and sexual orientation were assessed, and the odds of initiating sexual contact through the venues were calculated for each study group. The study found that the "sexual marketplace" to initiate sexual contacts of patients with early syphilis varies based on patient age, race/ethnicity and sexual orientation. Findings study highlight the need for targeted HIV and STDs prevention interventions tailored to the difference in age, race/ethnicity and sexual orientation at the different sex venues.

## **A pilot segmentation of gay and bisexual men in Los Angeles: Sexual practice attitudes, values, and beliefs.** *JA Montoya, H Rotblatt, CK Kent, A Plant, M Javanbakht, PR Kerndt.*

A sample of 297 MSM (age 18 or older) were interviewed. Information was collected on testing behavior, sexual practices, venues used to find partners, HIV status and agreement ratings for values, attitudes, and beliefs around disclosure, drug use, gay affiliation, gay identity, anonymous sex, multipartnerism, HIV seriousness, eroticism, and responsibility. A factor analysis was conducted on these agreement ratings that resulted in 8 factors. A hierarchical cluster analysis was performed on these 8 factors producing 5 distinct MSM "market" segments. The MSM segments varied in terms of HIV disclosure versus non-disclosure, sense of gay identity and affiliation, perceived social norms concerning sex, and values towards unrestricted sexual activity and drug use.

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## **National STD Conference...from page 14**

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*\*Part Two will Appear in the October Issue.*

**Kim Harrison, MPH CHES**

Health Educator, STD Program

## **Physician Registry Become a Member of the Health Alert Network**

The Los Angeles County Department of Public Health urges all local physicians to register with the Health Alert Network (HAN). By joining, you will receive periodic emailed updates alerting you to the latest significant local public health information as well as emerging threats like pandemic influenza and possible bioterrorist activity. Membership is free and all physician's information will remain private and will not be distributed to other agencies or used for commercial purposes.

Registration can be completed online at [www.lahealthalert.org](http://www.lahealthalert.org)  
or by calling (323) 890-8377

**Be alert to Public Health emergencies! Enroll now!**


## Immunization Update 2006

A live satellite broadcast from CDC highlighting current and late-breaking immunization issues. More info available at <http://www.lapublichealth.org/ip/trainconf/IZupdate.pdf>.

August 10, 2006, 9:00 AM - 11:30 AM  
DHS Auditorium, 313 N Figueroa St, Los Angeles, CA 90012


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# THE PUBLIC'S HEALTH

Newsletter for Medical Professionals in Los Angeles County



COUNTY OF LOS ANGELES  
**Public Health**  
313 North Figueroa Street, Room 212  
Los Angeles, California 90012

### Selected Reportable Diseases (Cases)<sup>1</sup> - February and March 2006

Disease	THIS PERIOD Feb & March 2006	SAME PERIOD LAST YEAR Feb & March 2006	YEAR TO DATE MARCH		YEAR END TOTALS		
			2006	2005	2005	2004	2003
AIDS*	218	271	341	382	1,514	2,213	2,433
Amebiasis	11	26	26	36	120	98	121
Campylobacteriosis	90	89	163	149	725	915	1,100
Chlamydial Infections	6,814	6,464	10,216	9,757	38,862	38,464	36,900
Encephalitis	2	6	6	10	67	137	38
Gonorrhea	1,800	1,590	2,741	2,421	10,494	9,696	8,078
Hepatitis Type A	135	19	217	31	470	319	376
Hepatitis Type B, Acute	12	16	17	22	56	71	56
Hepatitis Type C, Acute	1	0	1	0	3	5	0
Measles	0	0	0	0	0	1	0
Meningitis, viral/aseptic	70	81	107	122	680	790	899
Meningococcal Infections	9	4	18	11	37	28	32
Mumps	0	0	2	0	8	2	10
Non-gonococcal Urethritis (NGU)	121	225	196	326	1,101	1,470	1,410
Pertussis	15	60	38	69	433	141	130
Rubella	0	0	0	0	1	0	0
Salmonellosis	102	112	186	174	1,077	1,185	995
Shigellosis	54	59	91	130	732	550	669
Syphilis, primary & secondary	55	97	115	130	646	470	468
Syphilis, early latent (<1 yr.)	54	88	101	124	571	395	388
Tuberculosis	84	126	84	126	906	930	949
Typhoid fever, Acute	3	4	5	4	12	13	16

<sup>1</sup> Case totals are provisional and may vary following periodic updates of the database.