DCDC
Research Highlights

The following research highlights from the Division of Communicable Disease Control demonstrate the role of science in CDPH programs.

- **N. meningitidis Carriage Eradication Study** - In response to a recent increase in meningococcal disease in Kern County and identification of drug-resistant strains in the United States, the Immunization Branch collaborated with CDC and the Kern County Department of Public Health Services to conduct a N. meningitidis carriage eradication study. Asymptomatic meningococcal carriers are the primary source of *N. meningitidis* transmission and are at risk of developing active disease themselves. Over 700 students and faculty of a Bakersfield-area middle school participated in this study designed to identify a potential antimicrobial agent to be used as prophylaxis to prevent carriers from becoming ill or transmitting the disease. Results included measuring the carriage rate in this group, determining whether the endemic strain predominated, and identifying risk factors for carriage.
- **Meningitis Vaccine Impact** - CDPH Immunization Branch and the Microbial Disease Laboratory collaborated to determine the serogroup of each meningococcal meningitis case in California, to determine the impact of the recent meningococcal conjugate vaccine (Menactra) and observe for serogroup replacement with increased vaccine uptake. Each isolate undergoes genetic sequence analysis (MILVA) to evaluate if this technique helps confirm whether clusters of cases are related.
- **Infant Botulism Treatment and Prevention Program (IBTPP)** - After an approximately 15-year development period by CDPH (beginning in the former Department of Health Services), in October 2003, the U.S. Food and Drug Administration licensed the orphan drug Human Botulism Immune Globulin, or BabyBIG(R) for the treatment of infant botulism. In addition, IBTPP is developing novel methods to identify the causative infectious agent, Clostridium botulinum. These methods will improve the speed and sensitivity of diagnosing infant botulism and of detecting the botulism bacteria in bioterrorism and food-poisoning situations. In addition, IBTPP collaborates with the City of Hope (COH) Medical Center to develop and extend the COH-developed ALISSA assay for botulinum toxin. IBTPP showed that the ALISSA assay is more than 10,000 times more sensitive than the current "gold standard" test for detecting botulinum toxin. IBTPP and COH are applying the ALISSA assay to human clinical specimens. This new assay will greatly improve the diagnosis of all forms of human botulism and the country's bioterrorism preparedness.

- **Rapid Response Diagnostic Techniques** - In response to viral bioterrorist threats and emerging infectious diseases, the Viral and Rickettsial Disease Laboratory (VRDL) conducted research to develop rapid-response diagnostic techniques for viruses including West Nile virus , St. Louis encephalitis virus, dengue virus , yellow fever virus), alphaviruses western equine encephalitis virus and Chikungunya virus. These single-day tests can replace the current gold-standard test that requires seven to ten days.
- **Tuberculosis (TB)-Related Causes of Death** - The Tuberculosis Control Branch developed the first systematic method for investigating and determining cause of death in individuals who die with TB. This approach is being used in California to inform interventions and practice to avert future deaths. The Centers for Disease Control and Prevention (CDC) funded a national study of deaths building on the approach piloted in California.
- **Alternate Gonorrhea Treatments**- As resistance to fluoroquinolones increased, the Sexually Transmitted Disease Control Branch investigated which oral therapy options are best for treating gonorrhea and led the nation in developing treatment guidelines. As resistance spread across the United States, CDC relied heavily on California's work to develop national treatment guidelines.
- **Thimerosal and Autism** – The Immunization Branch and the Environmental Health Investigations branch examined time trends in autism over the period of changing exposure to thimerosal using data maintained by the California Department of Developmental Services (DDS). If thimerosal exposure is a primary cause of autism, rates of autism would be predicted to decrease as exposure to thimerosal has sharply decreased. The study found that childhood autism increased throughout the study period, during years in which thimerosal exposure first exceeded but was subsequently greatly reduced compared with historical levels.
- **Chlamydia** – The Sexually Transmitted Disease (STD) Control Branch participated in a nationwide randomized trial that demonstrated that expedited partner therapy reduces the rate of reinfection with chlamydia among women. These data served as the basis for California being the first state in the nation to legalize expedited partner therapy for treating chlamydia and gonorrhea. In addition, the STD Control Branch conducted a case-control chart abstraction study in selected California family planning clinics. The study identified predictors of chlamydia infection in non-pregnant women older than 25, resulting in a reduction in screening in this age group and more cost-effective screening guidelines.