

EPI—NOTES



Hillsborough County Health Department



Disease Surveillance Newsletter

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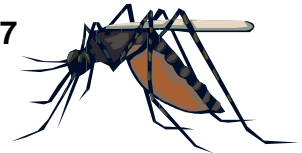
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Epidemic Dengue Fever in Puerto Rico in 2007

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The dengue virus is a single stranded RNA virus which shares the family Flaviviridae with the yellow fever virus. Dengue fever is a mosquito-transmitted disease caused by any of four closely related virus serotypes, DEN-1 through DEN-4. The usual incubation period of 2-7 days is followed by abrupt onset of fever, intense retro-orbital pain, and the severe musculo-skeletal pain of "break-bone fever". Deaths from uncomplicated dengue are unusual. Many cases are mild, unrecognized or unreported. Infection with any one of the four serotypes provides lifelong immunity only to the infecting serotype.

Subsequent infection with a different serotype, however, can place the person at risk of the more dangerous dengue hemorrhagic fever or dengue shock syndrome (DHF/DSS). Infants who have acquired maternal antibody *in utero* are likewise at risk. Clinically, DHF/DSS is characterized by bleeding manifestations, thrombocytopenia and increased vascular permeability, leading to life-threatening shock. The case-fatality ratio for DHF averages about 5% worldwide, but can be held below 1% with supportive clinical management. Acetaminophen products are recommended for managing fever but anticoagulants such as acetylsalicylic acid (aspirin) and nonsteroidal anti-inflammatory agents (ibuprofen) should be avoided.

The *Aedes aegypti* mosquito vector has a strong preference for human blood and breeds well in the relatively clean water of peridomestic containers. Following the global expansion of the human population and migration to over-crowded urban shantytowns, the mosquito has also spread throughout almost all tropical countries. The individual mosquito disperses over relatively short distances, suggesting that spread of the disease occurs primarily by movements of viremic individuals.

All four dengue serotypes are endemic around the globe and 40-80 million persons become infected annually. As of mid-2007, 630,356 cases accompanied by 12,147 cases of DHF/DSS and 183 deaths have been reported in the Americas, mostly in Brazil, Venezuela and Colombia. With the upcoming rainy season in many countries, total cases may exceed the 1,015,000 mark set in 2002. The virus was once assumed to have been nearly eliminated from Latin America, only to gain steadily since the 1980's. The incidence of DHF/DSS has also increased dramatically in Southeast Asia and the South Pacific in the past 25 years, with major epidemics occurring in many countries every 3-5 years. There is now the prospect that dengue fever could emerge as a pandemic similar to the one that became a leading killer of children in Southeast Asia after the Second World War. The U.S. Centers for Disease Control and Prevention recently issued a dengue outbreak notice that included Guadeloupe, Martinique, Mexico, Nicaragua, Brazil and Puerto Rico. Puerto Rico has experienced 500 new cases per week and 6,175 cases so far this year, 11 percent more than the entire year of 2006. According to local press coverage, the epidemic activity is said to have been confined to locations outside popular tourist haunts and the national health department is fumigating popular public areas on a daily basis. The nearby Dominican Republic has experienced more than 6,000 cases so far this year with 30 deaths.

Epidemic Dengue Fever in Puerto Rico in 2007 con't

In January 1998, dengue 3 (DEN-3) (group III genotype) was detected in Puerto Rico after an absence of 20 years. Virologic surveillance revealed an unexpected paradox: DEN-4 and DEN-1 produced a large overlying epidemic, obscuring the DEN-3 epidemic. In 1998 there were 17,000 reported cases of dengue (4.8/1,000 persons). Among all isolates (n=960), DEN-4 (43.6%), DEN-1 (35.1%) and DEN-2 (14.9%) were detected much more frequently than was DEN-3 (only 6%). The reappearance of DEN-3 and its subsequent circulation from 1999 to 2001 produced no increase in dengue incidence that would have been apparent in the absence of virologic surveillance (1).

A protective tetravalent vaccine must be licensed soon if dengue is to be brought under control. Strains of all 4 serotypes, attenuated by passage in tissue culture or by recombinant DNA technology, have been formulated into promising tetravalent vaccines and have entered successful phase 1 and 2 clinical trials in the United States and Southeast Asia (2). Even then, as with other diseases, the cornerstone of dengue prevention will remain the elimination of peridomestic larval breeding sites. Cultural barriers may be significant in the failure to prevent peridomestic mosquito breeding. Some Puerto Ricans do not associate dengue fever with mosquitoes in their own houses, but insist that "neighbors" need to control larval habitats and that the government should urge enforcement of trash disposal regulations (3). For personal protection, local pharmacies offer a solution of eucalyptus with lemon as a substitute for DEET.

If individual diagnostic testing by CDC in Puerto Rico is requested, acute- and convalescent-phase serum samples (collected 0-5 days and 6-30 days from fever onset, respectively) should be obtained and sent through state or territorial health department laboratories to CDC's Dengue Branch, Division of Vector-Borne Infectious Diseases (DVBID), National Center for Infectious Diseases, 1324 Calle Cañada, San Juan, Puerto Rico 00920-3860. Serum samples should be accompanied by clinical and epidemiologic information, including the date of disease onset, the date of collection of the sample, and a detailed recent travel history. For additional information, the Dengue Branch can be contacted by telephone 1-787-706-2399; fax 1-787-706-2496; e-mail hседа@cdc.gov; or the DVBID website at <http://www.cdc.gov/ncidod/dvbid/dengue/index.htm>.

U.S. physicians suspecting imported cases should collect a serum sample immediately for testing by the State Health Laboratory. Obtain a Laboratory Submittal Form at http://www.doh.state.fl.us/lab/PDF_files/doh_form.PDF. Specify the date of onset of illness, the date of serum collection and specify that the specimen is to be tested for dengue antibodies/virus culture.

Comparing the first 44 weeks of 2007 with 2006 in Florida, The Merlin Registry System documented an increase in the number of imported dengue fever cases. Reported cases more than tripled in 2007, from 12 (0.065 cases /100,000 residents) to 38 (0.206 cases /100,000 residents; $p < 0.0001$). In 2007 there were eight cases reported from Broward County, six from Orange County and two from Hillsborough County. In the United States, of 77 cases of dengue and DHF/DSS reported to the CDC between 2001 and 2004, 30% had traveled to a Caribbean island in the previous two weeks.

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- 2) Edelman R. Dengue vaccines approach the finish line. *Clin Infect Dis*. 2007 Jul 15;45 Suppl 1:S56-60
- 3) Pérez-Guerra CL, Seda H, García-Rivera EJ, Clark GG. Knowledge and attitudes in Puerto Rico concerning dengue prevention. *Rev Panam Salud Publica*. 2005 Apr;17(4):243-53.

DISEASE	2004 Yr end	2005 Yr end	2006 Yr end	3YR AVG (2004-2006)	Jan-Dec 06	Jan-Dec 07
AIDS	377	346	319	347.3	322	253
ANIMAL BITE, PROPHY REC.	17	30	38	28.3	38	20
ANTHRAX	0	0	0	0.0	0	0
BOTULISM	1	0	1	0.7	1	0
BRUCELLOSIS	2	0	0	0.7	0	0
CALIFORNIA SEROGROUP, NEUROINVASIVE	NR	NR	1	0.3	1	1
CAMPYLOBACTERIOSIS	59	45	45	49.7	45	57
CHLAMYDIA	2,964	3,208	3,800	3,324.0	3833	5,206
CIGUATERA	0	0	0	0.0	0	0
CREUTZFELDT-JAKOB DISEASE	2	0	1	1.0	1	0
CRYPTOSPORIDIOSIS	13	32	30	25.0	30	47
CYCLOSPORIASIS	0	40	0	13.3	0	2
DENGUE	1	3	0	1.3	0	2
DIPHTHERIA	0	0	0	0.0	0	0
EHRlichiosis, HUMAN GRANULOCYtic	0	0	0	0.0	0	0
EHRlichiosis, HUMAN MONOCYtic	0	0	0	0.0	0	0
ENCEPHALITIS, CALIFORNIA/LACROSSE	1	0	1	0.7	0	0
ENCEPHALITIS, HERPES	1	1	0	0.7	0	0
ENCEPHALITIS, NON-ARBOVIRAL	0	0	0	0.0	0	0
ENCEPHALITIS, OTHER	0	0	0	0.0	0	0
ENCEPHALITIS, EEE	0	0	0	0.0	0	0
ENCEPHALITIS, SLE	0	0	0	0.0	0	0
ENCEPHALITIS, WN	3	0	0	1.0	0	0
ESCHERICHIA COLI (E. COLI) O157:H7	4	6	4	4.7	4	4
E. COLI SHIGA TOXIN + NOT SEROGROUP	0	0	2	0.7	2	2
E. COLI SHIGA TOXIN + NON-O157	0	0	1	0.3	1	1
E. COLI, OTHER	0	0	0	0.0	0	0
FOOD AND WATERBORNE CASES	210	114	75	133.0	33	64
FOOD AND WATERBORNE OUTBREAKS	22	9	22	17.7	13	17
GIARDIASIS	62	64	81	69.0	81	87
GONORRHEA	1,197	1,261	1,685	1,381.0	1759	2,067
H. INFLUENZAE PNEUMONIA	3	5	0	2.7	0	5
H-FLU, PRIMARY BACTEREMIA	3	4	3	3.3	3	2
H-FLU, SEPTIC ARTHRITIS	NR	NR	NR	NR	0	1
HANSEN'S DISEASE (LEPROSY)	0	0	1	0.3	1	0
HANTAVIRUS	0	0	0	0.0	0	0
HEMOLYTIC UREMIC SYNDROME	0	1	2	1.0	2	1
HEPATITIS A, ACUTE	27	14	20	20.3	20	16
HEPATITIS B, ACUTE	60	41	41	47.3	41	38
HEPATITIS B, MATERNAL (HBsAg+ Pregnant)	42	41	38	40.3	38	63
HEPATITIS B, PERINATAL ACUTE	0	0	1	0.3	1	0
HEPATITIS B, CHRONIC	203	145	130	159.3	128	121
HEPATITIS C, ACUTE	9	3	4	5.3	4	2
HEPATITIS C, CHRONIC	1,184	827	1295	1,102.0	1295	1,349
HEPATITIS E, NON-A NON-B, ACUTE	0	1	1	0.7	1	0
HEPATITIS G	NR	NR	NR	NR	NR	1
HEPATITIS UNSPEC, ACUTE	0	1	0	0.3	0	0
HIV INFECTION	366	332	303	333.7	310	435
INFLUENZA, PEDIATRIC DEATH	0	0	1	0.3	1	1

LEAD POISONING	37	29	28	31.3	28	17
LEGIONELLOSIS	10	9	8	9.0	8	9
LEPTOSPIROSIS	0	0	0	0.0	0	0
LISTERIOSIS	0	1	2	1.0	2	2
LYME DISEASE	1	7	2	3.3	2	2
MALARIA	5	9	5	6.3	5	1
MEASLES	1	0	0	0.3	0	0
MENINGITIS, GROUP B STREP	3	4	3	3.3	3	2
MENINGITIS, H-FLU	4	1	1	2.0	1	1
MENINGITIS, LISTERIA MONO	0	0	1	0.3	1	0
MENINGITIS, OTHER	15	15	14	14.7	14	9
MENINGITIS, S PNEUMO	7	6	6	6.3	6	1
MENINGOCOCCAL DISEASE	4	4	1	3.0	1	6
MERCURY POISONING	0	0	1	0.3	1	0
MUMPS	1	2	1	1.3	1	3
NEUROTOXIC SHELLFISH POISONING	0	0	3	1.0	3	0
PERTUSSIS	3	34	43	26.7	43	18
PESTICIDE RELATED ILLNESS	0	0	0	0.0	0	0
POLIO, PARALYTIC	0	0	0	0.0	0	0
PSITTACOSIS	1	0	0	0.3	0	0
Q FEVER	0	0	0	0.0	0	2
RABIES ANIMAL	9	8	5	7.3	5	7
ROCKY MOUNTAIN SPOTTED FEVER	1	0	1	0.7	1	2
RUBELLA	0	0	0	0.0	0	0
SALMONELLOSIS	233	299	278	270.0	278	285
SHIGELLOSIS	49	251	140	146.7	140	44
SMALLPOX	0	0	0	0.0	0	0
STAPH AUREUS VISA/VRSA	0	0	0	0.0	0	0
STREP DISEASE, INVASIVE GROUP A	18	7	14	13.0	14	8
STREP PNEUMO, INVASIVE DRUG RESIST	50	46	65	53.7	65	48
STREP PNEUMO, INVASIVE SUSCEPTIBLE	39	35	44	39.3	44	35
SYPHILIS, CONGENITAL	1	0	1	0.7	1	1
SYPHILIS, INFECTIOUS	47	41	65	51.0	67	107
TETANUS	0	0	0	0.0	0	1
TOXOPLASMOSIS	2	0	1	1.0	1	2
TUBERCULOSIS	73	90	83	82.0	83	81
TYPHOID FEVER, ENDEMIC (MURIN)	2	1	1	1.3	1	1
VARICELLA*	NR	NR	2	NA	2	42
VIBRIO ALGINOLYTICUS	3	1	2	2.0	2	1
VIBRIO CHOLERA NON-01	0	0	0	0.0	0	0
VIBRIO FLUVIALIS	0	0	1	0.3	1	0
VIBRIO HOLLISAE	0	0	0	0.0	0	0
VIBRIO PARAHAEMOLYTICUS	0	2	1	1.0	1	0
VIBRIO VULNIFICUS	5	2	0	2.3	0	0
VIBRIO, OTHER	0	0	0	0.0	0	0
WEST NILE FEVER	0	0	0	0.0	0	0
YELLOW FEVER	0	0	0	0.0	0	0