

Mosquito-Borne Epidemics Threaten Katrina Survivors

by Laurence Hecht and Christine Craig

Contrary to denials by officials of the “mosquito President” George W. Bush’s Administration, there is a potential for the spread of devastating diseases among the vulnerable population in the wake of Hurricane Katrina. Water-borne diseases such as cholera, typhoid fever, and other diarrheal illnesses are threatened from stagnant, filthy water. Experts in entomology also warn of the danger of mosquito-borne diseases, especially West Nile and St. Louis encephalitis. As a final blow, the immunologically suppressed population will offer a vulnerability to the avian flu H5N1 pandemic which disease experts fear may strike the world this flu season.

Unlike 9/11, where damage was confined to a small area, Katrina is the kind of disaster in which the health threat worsens by the day. With the persistent flooding, mixed with sewage, animal and human corpses, spoiled food, and industrial chemicals spilled into the waters, a potentially lethal brew is being concocted for the survivors. There is an immediate threat from those “Third World” diseases such as cholera and typhoid fever, which are capable of causing devastating water-borne outbreaks. Infectious hepatitis, shigellosis, giardia, and *E. coli* are also likely candidates. Food poisoning bacteria including salmonella and *E. coli*, will develop in food exposed to contaminated water, or not properly refrigerated.

Coastal Louisiana and Mississippi are notorious breeding grounds for mosquito-borne illness. Without prophylactic spraying, the next few weeks will likely bring cases of St. Louis encephalitis, West Nile virus (encephalitis), and Eastern equine encephalitis, which are all present in the wild bird population in the area. In 1999, New Orleans suffered an outbreak of 20 cases of St. Louis encephalitis. The West Nile virus is the most likely to pose an epidemic threat, experts fear, if the most stringent measures of monitoring and control are not carried out.

The new ingredient for epidemics is the exposure of the human population to the biting mosquitoes. As a U.S. Army entomologist interviewed by *EIR* put it, “These people are presently denied the usual comforts such as air conditioning, tightly sealed houses and screening, which is what distinguishes us from Third World conditions.”

The *Culex quinquefasciatus*, or southern house mosquito, a vector for all the mosquito encephalitis viruses, has a propensity for stagnant water, rich in organic material, just the conditions prevalent in most of the affected area. The *encephalitides* which produce West Nile, Eastern and Western

Equine encephalitis, St. Louis, and other varieties are RNA viruses, transmitted from birds to humans and other mammals by insect vectors, particularly mosquitoes.

On the Ground in Baton Rouge

Matthew Yates, the director of the East Baton Rouge Parish mosquito control program, gave an appalling picture of the conditions in his area, in a Sept. 2 interview. East Baton Rouge parish contains the city of Baton Rouge, the state capital which is 80 miles upriver from New Orleans. The human population of Baton Rouge increased by hundreds of thousands overnight after the storm, Yates reported. Many homes are housing three and four families. Traffic is horrendous, and the gas supply short.

Spraying is going on in East Baton Rouge parish, but parishes to the east still had no electricity as of Sept. 2. Fallen trees and lack of fuel and electricity have grounded spray planes. People in the area are sleeping with open doors and window fans, working outside on repair projects, making them highly vulnerable to mosquito bites.

The most serious mosquito threat comes from West Nile virus. In 2002, Louisiana had an epidemic of 50 cases after a hurricane hit, Yates said. Prior to Katrina, there was an infection rate of 1.5 per 1,000 in East Baton Rouge parish. Populations of *Culex quinquefasciatus* are breeding in leaf-clogged gutters and drains and the ditches around sewage treatment plants which have overflowed from lack of electricity.

Apart from the *Culex*, large numbers of woodland mosquitoes are expected to come into residential areas, as the storm has blown leaves off trees and caused an animal exodus from forests, Yates explained. Some are vicious biters and can transmit West Nile. First flights of the woodland species were expected Sept. 2 and 3. It will take about another week for infectious capability to develop, after the mosquitoes feed on infected birds and then take their next blood meal on a human.

The Asian tiger mosquito (*Aedes albopictus*), a vector of West Nile virus and dengue fever, also breeds around homes. It emerges in 10 days after a storm, bites a bird carrying the virus, and becomes infectious to humans in a few more days. The problem does not abate until cool weather arrives in the area, around the first of October.

The infrastructure is down in New Orleans and the surrounding parishes, so no spraying is being done in the city or



National Institutes of Health

This typical southern house mosquito, Culex quinquefasciatus, is a vector for all the mosquito encephalitis viruses. It thrives on conditions like those in Katrina's aftermath: stagnant water that is rich in organic material.

adjacent areas. Military aircraft or private contractors will be needed to do aerial spraying.

Culex salinarius, a salt water species capable of West Nile virus transmission, is likely to breed in sewers, and other standing water around the city, Yates speculated. This could emerge as a threat to the human population by mid-September. Marshes on the north side of Lake Pontchartrain are a nesting ground for migratory birds likely to carry the virus. Without spraying, the only protection is repellents. There are effective repellents, but they must be applied assiduously. People otherwise distracted are not likely to be able to maintain repellent protection, even if they have access to it.

The state of Mississippi, badly hit by Katrina, has no county-level mosquito control programs, and little spraying is carried out except in some municipalities, according to State Entomologist Dr. Jerome Goddard. Application has been made for assistance from the Centers for Disease Control to dispatch experts in entomology. Spraying will have to come through FEMA assistance.

Eastern equine encephalitis, the most deadly of the mosquito-borne viruses, was present in southeastern Mississippi among horses before Katrina struck. One-third to one-half of human beings infected by this virus die. Among children, it is almost 100 percent fatal. Eastern equine does not normally appear as an epidemic, but the high mortality rate makes it fearsome.

Power is still out for 60,000 people in Jackson, Miss. (80 miles due north of New Orleans), and every mile south the destruction gets worse, the state entomologist reported Sept. 2. A town just 30-minutes' drive to the south will be three weeks without electricity. People are sitting outside under trees in the heat, with little clothing, sleeping on cots, and getting bitten.

Could Malaria and Yellow Fever Come Back?

Rural malaria was a major public health problem in the United States up to the mid-1940s, when DDT spraying programs virtually wiped it out. The *Anopheles* mosquito, which transmits the disease to human beings, is still present in the Gulf Coast region, and cases arise nationally. Most entomolo-

gists do not expect a return of the disease in epidemic form, but watch very carefully for it.

For an epidemic to arise, human individuals carrying the gametocyte of one of the four species of parasites would have to be bitten by a female *Anopheles* mosquito. The gametocyte would mature in the mosquito stomach and engage in sexual reproduction there, producing a zygote which penetrates the stomach wall. There it becomes an oocyst, which, after more divisions, releases hundreds of young plasmodia into the mosquito blood. The mosquito is then a transmitter of the deadly malaria parasite which invades the human red blood cells causing high fevers and often death. Malaria gametocytes may exist among the population of migrant workers and travellers to tropical regions living in the hurricane area. Under the worst possible circumstances, an outbreak could occur.

Yellow fever was once the scourge of the Louisiana Territory. In 1741, England sent Admiral Edward Vernon with 27,000 men to Mexico and the Louisiana Territory. They retreated after 20,000 were killed by yellow fever. In 1802, Napoleon's brother-in-law, Charles LeClerc, came to the Louisiana Territory with 33,000 soldiers, but gave up after 29,000 of them died of yellow fever.

In 1900, in Cuba, the U.S. Yellow Fever Commission under direction of Walter Reed proved that the fever was transmitted only by the bites of *Aedes aegypti* mosquitoes. The *Aedes aegypti* were almost eradicated in Central America and the Caribbean, but still abound in the southeastern United States. The disease was eliminated in the U.S.A. by spraying programs and an effective vaccination program, after a vaccine became available in 1942. Vaccination is no longer used. In recent decades, yellow fever prevalence has been restricted to parts of equatorial Africa and South America. It is not impossible that it could return to the southeast United States under prolonged aggravated conditions, as the mosquito vector is still present.

For now, the most likely widespread danger from mosquitoes for Katrina survivors is the West Nile virus, a disease that first appeared in the United States in 1999 with an epidemic near New York City. In 2002, the virus killed 284 people in the United States out of some 4,000 infected. Louisiana has had 52 cases so far in 2005. St. Louis encephalitis, present in the bird population of the affected region, may also take epidemic form. A major outbreak occurred in Mississippi in 1975, infecting more than 300 people. Fatality rates range from 2 to 20 percent, while most deaths occur in people 60 or older.

A final note: The 1918 Spanish flu (an avian virus like the one which threatens the world again today) was aided in its spread by the close contact and unsanitary conditions of soldiers during World War I. If the right flu combination intersects with the disaster conditions engendered by Katrina and the criminal incompetence of the Federal Government in its preparedness and response, the stage could be set for a new pandemic.