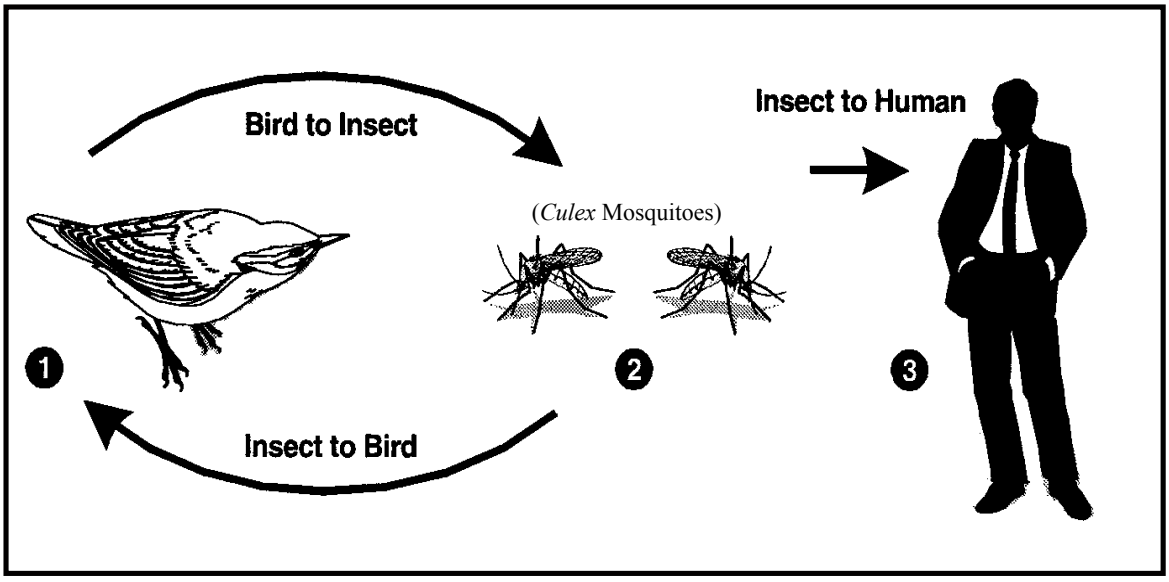
Surveillance and Response Procedures for Mosquito-borne Arbovirus Emergencies

West Nile Virus / St. Louis Virus Encephalitis Cycle



West Nile Virus Hot Line (Toll Free): 866-369-9710

Illinois Department of Public Health
525 / 535 West Jefferson Street
Springfield, Illinois 62761
217-782-4977

Web Site: www.idph.state.il.us
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January 2005

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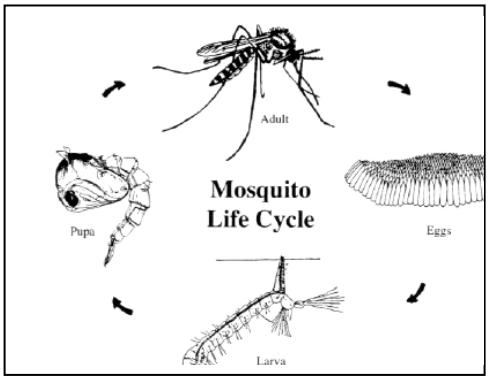

Part I. Purpose

Rationale and Objectives

The first outbreak of West Nile virus (WNV) infections in the Western Hemisphere occurred in the vicinity of New York in 1999. This outbreak was originally believed to be due to the St. Louis encephalitis (SLE) virus, based on serologic test results. Investigation of a simultaneous outbreak of bird fatalities in the area, originally believed to be unrelated to the outbreak in humans, revealed a flavivirus different from the SLE virus. Some flaviviruses produce cross-reacting antibodies. WNV antibody cross-reacting with SLE antibody was responsible for the original diagnosis of SLE in the human outbreak. In this outbreak there were 62 confirmed human cases and seven deaths. This virus survived the winter of 1999-2000 in the New York area when multiple dead crows found in May and June 2000 were confirmed with WNV. After 1999, WNV continued to spread west. In 2002, there was an outbreak of WNV in the Midwest; Illinois recorded 884 cases and 66 deaths. West Nile virus activity and human cases were also reported in the state during 2003 and 2004, and, WNV is likely to be a threat to public health for the foreseeable future.

Consequently, Illinois Department of Public Health (IDPH) staff representing environmental health, laboratory and epidemiology disciplines began meeting in January 2000 to discuss plans for incorporating WNV surveillance into the following existing arbovirus surveillance activities:

- Since 1976, human surveillance and avian surveillance have been conducted annually for mosquito-borne viruses. Hospital infection control practitioners, hospital laboratories and infectious diseases physicians are reminded in June of each year to report clinically diagnosed cases of encephalitis and aseptic meningitis. Acute and convalescent serum specimens and cerebrospinal fluid (CSF) specimens are requested to be submitted to the IDPH laboratory for arbovirus antibody testing. Local health departments also assist in acquiring convalescent phase serum specimens from patients for arbovirus antibody testing. Sera is tested for antibodies against SLE, Eastern equine encephalitis (EEE) and LaCrosse encephalitis (LAC). Specimens testing positive for SLE or WNV are confirmed by plaque reduction neutralization testing (PRNT).

- When feasible, employees of local health departments and the Illinois Department of Natural Resources (IDNR) collect dead birds when clusters occur and submit them to an Illinois Department of Agriculture (IDA) laboratory or the University of Illinois Veterinary Diagnostic Laboratory for necropsy and testing.

- Along with the Department, many local health departments, mosquito abatement districts, municipalities and the Illinois Natural History Survey collect and test Culex mosquitoes for WNV and SLE. During the last three years, the Department has established a password-protected portal to the Department's WNV Web site. Cooperating agencies input their data into the Department's data base and view maps of WNV activity throughout the state.

- Deaths of wildlife other than crows and blue jays are referred to the Illinois Department of Natural Resources. IDNR then investigates the incidents to determine if the wildlife mortalities have been caused by disease or possible exposure to toxicants.

- The Illinois Department of Agriculture reports deaths of equines and exotic mammals from WNV to the Department.

The objectives of this document are to:

(1) increase WNV surveillance for infected mosquitoes and birds throughout the state,

(2) increase serologic testing for evidence of arbovirus infection of human cases that are clinically compatible with arbovirus infections,

(3) pursue reporting of equine encephalitis cases and bird mortality, and

(4) provide state and local health officials with up-to-date information about surveillance and response to arbovirus emergencies.

These activities will help suppress West Nile virus activity in Illinois and prevent human illness and economic loss from the disease.

Part II. Plan Concept

Surveillance and Response Functions

Introduction

Historical Summary of Mosquito-borne Encephalitis in Illinois

There are two mosquito-borne arboviruses (arthropod-borne viruses) that have caused a large number of human cases in Illinois over the past 30 years: St. Louis encephalitis and West Nile virus. Other arboviruses occurring in the U.S. include Eastern equine encephalitis, Western equine encephalitis and La Crosse encephalitis. Public health response to these arboviruses will need to be tailored to the specific virus and its transmission cycle. With arboviruses that have a bird reservoir, surveillance of wild bird populations can be used to help predict outbreaks due to virus circulation in birds.

St. Louis encephalitis

Historically, there have been six outbreaks of mosquito-borne St. Louis encephalitis (SLE) in Illinois: **1932** (Paris, Illinois, not recognized as St. Louis encephalitis until 1933), **1933** (southwestern Illinois in conjunction with the major epidemic in St. Louis, Missouri), **1955** (West Salem), **1964** (McLeansboro), **1968** (Eldorado), and **1975** (statewide). Epidemics do not occur in regular cycles, but depend on a combination of factors such as virus activity the previous year, above normal rainfall and high populations of mosquitoes that transmit the infection to birds. Man is incidentally involved in this cycle when bitten by the virus-carrying mosquito. Clinical illness occurs in less than 1 percent of infected persons. Among those with clinical illness, as few as 60 percent may have encephalitis, with the remainder having aseptic meningitis or febrile headaches. Although outbreaks have occurred in Florida, Texas, and Arkansas in recent years, there have been few documented cases of SLE in Illinois and the upper Midwest. However, there is evidence from Illinois and other upper Midwestern states that SLE virus continues to be transmitted in the avian reservoir at measurable levels. Consequently, the potential for an SLE outbreak exists.

West Nile virus

The most recent introduction of an arbovirus into the U.S. was that of West Nile virus (WNV). Until 1999, this virus had not been reported in the Western Hemisphere. WNV is a member of the Japanese encephalitis complex of flaviviruses and is transmissible by mosquitoes. Mosquitoes, primarily bird-feeding species, are the principle vectors of WNV, although the virus has been isolated from other bird-feeding arthropods, including some tick species. The natural transmission cycle involves a bird-mosquito connection, but may include a tick-bird connection. The urban cycle of the disease requires mosquito species that will feed on free-ranging or domestic birds, and humans.

WNV can cause a febrile illness with headache, rash, stiff neck, muscle weakness and disorientation. Severe neurological illness occurs in less than 1 percent of those infected. Many persons experience asymptomatic infection. From 3 percent to 15 percent of cases are fatal. WNV was first isolated in Uganda in 1937 from a febrile woman and was subsequently isolated from other human patients, birds and mosquitoes. It has a wide geographic distribution and

has been involved in human disease outbreaks in Africa, southwest Asia and Europe. In endemic areas, the virus has been isolated from mammals including mice, hamsters, camels, cattle, horses, dogs and lemurs. It can cause clinical disease in a wide variety of animals, but fatalities are highest in humans, horses, crows and blue jays.

West Nile virus has persisted in the four states originally affected in 1999 and expanded across the continental United States causing outbreaks in Illinois and other Midwestern states in 2002. In 2003 and 2004, WNV outbreaks occurred in the central U.S. west of the Mississippi River. Although some decrease in severe human illness may be attributable to vector-control and other prevention activities, experience in Europe shows that the incidence of human illness can be variable and outbreaks sporadic.

Because widespread WNV epizootic activity probably will persist and expand in the United States, larger outbreaks of WNV infection and human illness are possible if adequate surveillance, prevention activities and mosquito control are not established and maintained. Surveillance should include monitoring WNV infection in dead birds (particularly crows and blue jays), humans and horses. Collecting and testing of mosquito populations can be added where WNV activity has been identified.

La Crosse encephalitis

La Crosse encephalitis virus (LAC), one of the California serogroup viruses, is another mosquito-borne virus that threatens public health. Even though LAC is the most consistently occurring mosquito-borne illness in Illinois, it is an endemic rather than epidemic disease. The eastern tree-hole mosquito (*Ochlerotatus triseriatus*), the usual vector of LAC, is normally found in discrete sites near woods or near accumulations of water-filled manmade containers like used tires. A new potential vector, the Asian tiger mosquito, is capable of transmitting LAC in the laboratory. The Asian tiger mosquito (*Aedes albopictus*), first discovered in Illinois in 1986, is expanding its range via the transport of used tires containing mosquito eggs. Small rodents, such as chipmunks, act as reservoirs for the virus. Monitoring of wild bird populations is an ineffective surveillance method because wild birds are not involved in the transmission cycle. Instead, when a probable or confirmed human case occurs, an environmental investigation should be conducted around the residence to identify man-made containers, such as tires. If large numbers of man-made containers are identified, a cleanup of the site is instituted.

Eastern equine encephalitis

Another possible threat is eastern equine encephalitis (EEE), which is endemic in nearby southern Michigan. Wild birds act as reservoirs for EEE. Although no confirmed human cases have been reported from Illinois, wild birds seropositive for EEE have been detected in northern Illinois in recent years. Some of the birds were non-migratory, indicating they were infected in Illinois.

Western equine encephalitis

In recent years there has been little western equine encephalitis activity in the United States. Wild birds are a reservoir for WEE, which usually is detected west of the Mississippi River.

Surveillance of feral bird populations can detect SLE, EEE, WEE and WNV activity. Consequently, the responses described in this plan would prepare for an outbreak of these encephalitis arboviruses.

Encephalitis Prevention by Local Health Departments and Other Agencies
The primary means of prevention performed by local health agencies should be public education of mosquito-borne diseases. An active public information effort includes conducting seminars or lectures, interviews with news media, news releases, etc. Informed citizens should remove man-made containers from around their residences and report suspected mosquito breeding sites to health authorities.

Nevertheless, even the most effective mosquito control program cannot eliminate mosquitoes. Mosquito bites and disease can be prevented through properly maintained door and window screens, protective clothing and repellents. Directions on the repellent's label should be followed. Long sleeves and long pants offer additional protection against mosquito bites, and mosquitoes are less attracted to white clothes than to dark colored clothes.

Some communities fund local mosquito control programs. Community-wide mosquito abatement efforts can be effective when conducted as part of an Integrated Pest Management (IPM) program. The primary focus of IPM programs for mosquito control should include monitoring and draining or treating areas where mosquitoes breed; such as occasionally flooded marshes, river backwater areas, swamps and other low-lying areas.

Surveillance and Response Procedures for Mosquito-borne Arbovirus Emergencies

I. Purpose
The purpose of this document is to establish procedures that will ensure rapid state agency response to significant public health threats from mosquito-borne arboviral infections such as West Nile virus, St. Louis encephalitis virus, equine encephalitis and others, particularly when such threats involve more than one jurisdiction or cross state boundaries. Significant threats are those that are severe, widespread and/or beyond the capabilities of local health jurisdictions. Other objectives of the document are:

- To ensure effective and timely communication between local, state, regional and federal agencies, academia, and animal and human health care professionals when a significant arbovirus threat is identified.

- To define state agency roles for significant arboviral threat responses, including education and other activities.

- To ensure arbovirus surveillance at the local level in areas where a significant threat is identified.

- To ensure the implementation of appropriate arbovirus control measures.

- To provide for smooth transition between local surveillance and emergency response activities.

II. Plan Concept
The concept of this plan is based on the combined surveillance of human, insect, bird and mammal populations for indications of the presence of arboviral encephalitis. As the reservoir of disease, wild birds are a key surveillance tool for response.

The planning and response actions are categorized into two major groups of activities: Surveillance Functions (Human Surveillance, Bird and Mammal Surveillance, Mosquito Surveillance) and Response Functions (Public Information, Mosquito Control).

A. Surveillance Functions

Human Surveillance – Before June 15 of each year, IDPH sends a memo on human arboviral surveillance and reporting requirements to local health departments and infection control

personnel. Local health departments conduct human surveillance for arboviral infection between June 15 and October 31 of each year. During this time frame, laboratories are requested to submit cerebrospinal fluid* and/or serum from individuals with aseptic meningitis or acute encephalitis to the IDPH laboratory for arbovirus testing (WNV, EEE and SLE). Acute and convalescent sera are requested. In addition, aseptic meningitis and acute encephalitis are reportable in Illinois. If human cases of SLE or WNV began to occur, increased surveillance activities might be undertaken, including the active surveillance of selected health care providers. Records of humans testing positive for arboviruses are maintained in a database by the IDPH Communicable Disease Section.

> *It is important that CSF be collected and transported under the proper conditions, either on cold pack or (preferably) frozen, both for human serologic testing and for virus isolation; otherwise it will be useless to attempt isolation.

Avian and Mammal Surveillance – Birds are considered the primary reservoir for arboviruses such as SLE and WNV. Mammals, particularly horses, can also be infected with arboviral encephalitis and thus provide a mechanism for identifying transmission of the organism in the community. Encephalitis in horses is reportable in Illinois to the Illinois Department of Agriculture (IDA). With WNV, wild birds, especially crows, may die from WNV infection. Protocols have been established to collect and test dead indicator birds for WNV (crows and blue jays). Birds are first sent to the IDA laboratory in Galesburg, Illinois and, if deemed necessary, shipped to a wildlife laboratory in Madison, Wisconsin (see Appendix). Deaths of flock birds are more likely to be from poisoning than WNV. Horses affected with encephalitis are tested for WNV in cooperation with the IDA. Information on WNV surveillance and the required reporting of encephalitis-positive horses will be published by the Illinois State Veterinary Medical Association and in the IDA newsletter. Zoos and the Illinois Department of Natural Resources (IDNR) will be notified of the protocol for submitting birds for WNV testing. Weekly summaries of wild bird serologic testing, animal and human cases, will be circulated by the IDPH Division of Environmental Health to selected IDPH, IDA and IDNR employees. Records of birds and mammals testing positive for arboviruses are maintained in a database.

Mosquito Surveillance – Testing mosquitoes for WNV using a rapid and simple test kit can be considered in addition to testing dead indicator birds. If virus activity is found in the region, mosquito surveillance can supplement avian and human surveillance. Initial activities will involve trapping, sorting species and determining population densities by species, and testing local mosquitoes. The risk of disease transmission should be considered elevated if infected mosquitoes are collected.

B. Response Functions

Public Information – Information dissemination to the public, support communities (health care providers, veterinary communities, etc.) and other governmental entities is essential for the effective implementation of this plan. Bulletins, literature, Web sites, news briefs and technical briefs applicable to each stage of the disease should be prepared. The information provided is dependent upon the specific arbovirus involved in the outbreak.

Mosquito Control - The safest and most useful approach to mosquito control is to prevent mosquito breeding by eliminating unnecessary pools of water and by properly maintaining swimming pools, birdbaths, etc. Jurisdictions that have ordinances prohibiting the breeding and harborage of disease-causing insects should enforce such codes. Early season control activities are typically limited to breeding site reduction efforts and catch basin larviciding, since reducing the adult mosquito population directly reduces the chance of subsequent mosquito-borne disease transmission.

Some localities routinely conduct larviciding and perform some adulticiding as a nuisance

reduction measure. The decision to move from this level of control to more aggressive strategies is dependent upon the jurisdiction. Should there be a significant human disease incidence, a regional approach may be recommended. Limited adult mosquito control, to include spraying by truck-mounted units and, ultimately, aerial pesticide application, is expected to involve intensive discussion and planning between the local, state and federal jurisdictions before implementation.

Part III. Authorization

All actions taken during the execution of this plan are authorized and conducted in accordance with provisions of the following laws and regulations: Vector Control Law (ILCS 95/1 to 11), Illinois Pesticide Act, Mosquito Abatement District Act, Nuisance Statute and other appropriate statutes.

Part IV. Arbovirus Surveillance Committee

A. Policy Group Members

Members and Function -The Policy Group will determine the need for appropriate resources, develop a response plan, assign actions to be undertaken by the Response Group, resolve issues not easily addressed by any individual on the committee, and, if necessary, mobilize a communications group. The Policy Group includes:

Director of Public Health
Deputy Director, Office of Health Protection
Chief, Division of Laboratories
Chief, Division of Infectious Diseases
Chief, Division of Environmental Health
State Public Health Veterinarian
State Epidemiologist, IDPH
Chief, Governmental Affairs
Emergency Officer, IDPH Office of Health Protection
Chief, Division of Communications
IDPH Communications Manager, Illinois Department of Central Management Services
Invited Representatives - Illinois Department of Agriculture, state veterinarian, Illinois Department of Natural Resources

Responsibilities:

- allocate resources,
- develop and update a response plan,
- assign actions to the Response Group,
- resolve issues related to Response Group activities, and
- disseminate news releases concerning the status of arboviral disease activity in the state.

B. Response Group Members

Members and Function - The Response Group will support the investigation of an arbovirus outbreak. They will gather and assess data, support or conduct epidemiological investigations and manage the response.

Responsibilities:

- Keep the Director and other agencies advised as to the status of serologically confirmed human cases.
- Lead epidemiological investigations of arboviral disease cases in humans.
- Assist as requested in epidemiological investigations of outbreaks potentially related to insects.
- Coordinate collection of human sera from affected individuals.
- Summarize the results of avian serologic testing, virus detection in avians, and testing of equines and humans.
- Report and disseminate activity results.

Division of Infectious Diseases Response Members
Regional Communicable Diseases Staff
Local Health Department Communicable Diseases Staff
Rapid Response Team Members

The Division of Infectious Diseases will:

- Coordinate communicable disease control program activities by local health departments,
- Conduct epidemiological investigations or support investigations performed by local health departments,
- Receive and prepare an assessment of data related to an arboviral outbreak,
- Respond to technical information requests, and
- Implement the response plan.

Division of Environmental Health Response Members
Vector Control Program Manager and Regional Environmental Health staff
Toxicology Program Manager
Structural Pest Control Program Manager
Rapid Response Team Member

The Division of Environmental Health will:

- Gather environmental surveillance data,
- Conduct avian and mosquito collections and surveillance,
- Report and disseminate status of positive avian and mosquito samples, and
- Assist local agencies with implementation of environmental interventions such as tire collections and other breeding site elimination measures and local applications of larvicides and adulticides, etc.

Division of Laboratories Response Members
Director, Division of Laboratories

The Division of Laboratories will:

- Test specimens and provide results to providers and the Division of Infectious Diseases.
- Forward specimens as needed to the Centers for Disease Control and Prevention (CDC) for confirmation.

C. Allied Agencies

Because of their responsibilities in issues related to an outbreak of arboviral encephalitis, the following agencies will be kept informed of data concerning the possibility of an outbreak of arboviral encephalitis:

Agency	Telephone number	Responsibilities
Illinois Emergency Management Agency	217-782-2700	Coordinates Emergency Response
Illinois Department of Agriculture, Division of Animal Health*	217-782-4944	Monitors Diseases of Domestic Animals
Illinois Department of Agriculture, Division of Environmental Programs	217-785-2427	Licenses Mosquito Control Personnel, Registers Insecticides for Use in Illinois, Investigates Alleged Misuse of Mosquito Control Pesticides

Illinois Department of Natural Resources** (IDNR)	217-782-6302	Health of Wildlife
Illinois Environmental Protection Agency	217-524-5024	Regulates Cleanup and Disposal of Hazardous Wastes and Used Tires
U.S. Environmental Protection Agency - Region 5	312-886-7835	Registers Insecticides for Use in Illinois

* Invited member of the Department's Policy Group.

**Additionally, IDNR has two technical resource agencies: Natural History Survey (mosquito biology research) 217-244-1349 and Natural Heritage (nongame wildlife) 217-785-8774.

Risk Levels Based on Surveillance Data

Arbovirus surveillance conducted in Illinois is best suited for detecting evidence of the potential for a widespread epidemic. Some localized positive bird, mammal or mosquito results might be detected prior to the occurrence of human disease, but the geographical boundaries of the risk will not be well defined. Other localized transmissions of arboviruses among birds, mosquitoes and equines will not be detected prior to the occurrence of human cases because of the limited number of surveillance sites. For St. Louis encephalitis (SLE), wild bird serology can be an early indicator of increased viral activity. From surveillance data from Illinois, 1976 and 1977, and from other surveillance programs, the onset of human cases of SLE appears to occur two to six weeks after seropositive birds are detected. For WNV activity, surveillance data indicate that positive birds and/or mosquitoes can be detected about two to six weeks prior to human cases. As a result, the implementation of response efforts must be rapid. A delay of one or two weeks will likely result in the occurrence of human cases of encephalitis that could have been prevented. The establishment of formal response guidelines *before* an epidemic will help public health agencies act quickly to minimize human disease. A number of factors acting in concert trigger response by IDPH and other public health agencies. Action threshold levels are based on a combination of environmental conditions conducive to mosquito production; detection of eastern equine encephalitis, SLE, western equine encephalitis or WNV in feral birds; virus detections from mosquito samples; and serologically positive cases of the disease in humans or horses. The triggering criteria and the responses are intended as a *framework,* rather than a rigid structure, for decision-making by public health agencies.

The following table is adapted from *Epidemic/Epizootic West Nile Virus in the Untied States: Revised Guidelines for Surveillance, Prevention and Control*, Centers for Disease Control and Prevention, 2003. http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-apr-2001.pdf

Table 1. Suggested Guidelines for Phased Response to West Nile Virus Surveillance Data

Risk Category	Probability of Human Outbreak	Definition	Recommended Response*
0	None	Off season; adult vectors inactive; climate unsuitable.	Develop WNV response plan. Secure surveillance and control resources necessary to enable emergency response. Initiate community outreach and public education programs. Conduct audience research to develop/ target education and community involvement. Contact community partners.
1	Remote	Spring, summer or fall; areas anticipating WNV epizootic activity based on previous WNV activity in the region; no current surveillance findings indicating WNV epizootic activity in the area.	Response as in category 0, plus: conduct entomologic survey (inventory and map mosquito populations, monitor larval and adult mosquito density); initiate source reduction; use larvicides at specific sources identified by entomologic survey and targeted at likely amplifying and bridge vector species; maintain avian mortality, vector and virus surveillance; expand community outreach and public education programs focused on risk potential and personal protection, and emphasizing residential source reduction; maintain surveillance (avian mortality, mosquito density, human encephalitis/meningitis and equine illness).
2	Low	Summer or fall; areas with limited or sporadic WNV epizootic activity in birds and/or mosquitoes. No positives prior to August.	Response as in category 1, plus: increase larval control and source reduction and public education emphasizing personal protection measures, particularly among the elderly; enhance human surveillance and activities to further quantify.
3	Moderate	Spring, summer or fall; areas with initial confirmation of epizootic WNV in birds before August; a horse and/or a human case, or sustained WNV activity in birds and/or mosquitoes.	Response as in category 2, plus: intensify adult mosquito control in areas where surveillance indicates human risk, initiate adult mosquito control if not already in progress, initiate visible activities in community to increase attention to WNV transmission risk (speaker, social marketing efforts, community mobilization for source reduction, etc.), work with collaborators to reduce risks to elderly (e.g., screen repair).
4	High	Spring, summer or fall; quantitative measures indicating WNV epizootic activity at a level suggesting high risk of human infection (*e.g.*, high dead bird densities in early summer, sustained high mosquito infection rates, multiple positive mosquito species, horse or mammal cases indicating escalating epizootic transmission, or a human case and high levels of epizootic activity). Areas with early season positive surveillance indicators where WNV epidemic activity has occurred in the past.	Response as in category 3, plus: Expand public information program to include TV, radio, and newspapers (use of repellents, personal protection, continued source reduction, risk communication about adult mosquito control); increase visibility of public messages and engage key local partners (e.g., government officials, religious leaders) to speak about WNV ; intensify and expand active surveillance for human cases; intensify adult mosquito control program, repeating applications in areas of high risk or human cases.
5	Outbreak in Progress	Multiple confirmed cases in humans; conditions favoring continued transmission to humans (*e.g.*, persistent high infection rate in mosquitoes, continued avian mortality due to WNV).	Response as in category 4, plus: intensify emergency adult mosquito control program repeating applications as necessary to achieve adequate control; enhance risk communication about adult mosquito control; monitor efficacy of spraying on target mosquito populations; if outbreak is widespread and covers multiple jurisdictions, consider a coordinated widespread aerial adulticide application; emphasize urgency of personal protection through community leaders and media, and emphasize use of repellent at visible public events.

*Local and regional characteristics may alter the risk level at which specific actions must be taken.

Contact Information for the Illinois Department of Public Health

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<tr><td colspan="2">

Springfield Headquarters
525-535 W. Jefferson St.
Springfield, IL 62761-0001
217-782-4977

Illinois Office of Communication and Information
(for all news media inquiries)
217-558-1540
217-558-1542

Chicago Headquarters
160 N. LaSalle St.
Chicago, IL 60601
312-814-2608

Web Site: www.idph.state.il.us **E-mail:** mailus@idph.state.il.us

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<tr><td>

Division of Infectious Diseases
217-782-2016

(Questions about human disease)

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Division of Environmental Health
217-782-5830

(Questions about mosquitoes and bird testing)

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Public Health Laboratory - Chicago
(Arbovirus Testing)
2121 W. Taylor St.
Chicago, IL 60612
312-793-4760

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IDPH Regional Offices and Local Health Departments:

Please see
http://www.idph.state.il.us/local/map.htm

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Part V.

Arbovirus, Vector Control and Insect Repellent Fact Sheets and Technical Information

Internet Resources

The following Web sites are provided for information only. Publications that contain pesticide use recommendations are subject to change at any time. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. No endorsement is intended for products listed, nor is criticism meant for products not listed.

Agency	Title	Web Site Address
IDPH	West Nile Virus Web Site	**http://www.idph.state.il.us/envhealth/wnv.htm**
	Mosquitoes	**http://www.idph.state.il.us/public/hb/hbmosquito.htm**
	Prepared News Releases about Mosquito Prevention (pdf File)	**http://www.idph.state.il.us/envhealth/pdf/mosquito-borne01.pdf**
	Questions and Answers about Mosquito Prevention for People, Property and Pets	**http://www.idph.state.il.us/envhealth/factsheets/psreduction.htm**
	Questions and Answers about Spraying for Adult Mosquitoes	**http://www.idph.state.il.us/envhealth/factsheets/fog.htm**
	Pyrethroid Insecticides	**http://www.idph.state.il.us/envhealth/factsheets/pyrethroid.htm**
CDC	Many References	**http://www.cdc.gov/ncidod/dvbid/index.htm**
CDC and U.S. EPA	CDC / U.S. EPA Joint Statement On Mosquito Control	**http://www.epa.gov/pesticides/factsheets/mosquitojoint.htm**
	Pesticides and Public Health: Integrated Methods of Mosquito Management	**http://www.cdc.gov/ncidod/eid/vol7no1/rose.htm**
U.S. EPA	U.S. EPA and Mosquito Control	**http://www.epa.gov/pesticides/factsheets/skeeters.htm**
	Using Insect Repellents Safely	**http://www.epa.gov/pesticides/factsheets/insectrp.htm**
	Larvicides for Mosquito Control	**http://www.epa.gov/pesticides/citizens/larvfs.pdf** **http://www.epa.gov/pesticides/factsheets/larvicides4mosquitos.htm**
	Synthetic Pyrethroids for Mosquito Control	**http://www.epa.gov/pesticides/citizens/synpyfs.pdf** **http://www.epa.gov/pesticides/factsheets/pyrethroids4mosquitos.htm**
University of Illinois Extension	Community Mosquito Management	**http://www.ipm.uiuc.edu/hyg/insects/mosquitoes/**
	Mosquito Control: What Doesn't Work	**http://www.ipm.uiuc.edu/wnv/ftb_mosquito_control.doc**
Ill. Dept. of Natural Resources	Fish Stocking for Mosquito Control	**http://dnr.state.il.us/fish/FishStockingForMosquitoControl.htm**
Rutgers University, N.J.	Products /Promotions that have Limited Value for Mosquito Control	**http://www-rci.rutgers.edu/~insects/proprom.htm**
U.S. Geological Survey	West Nile Distribution Maps	**http://nationalatlas.gov/virusmap.html**
Other West Nile Virus Sites	Cornell University WNV site	**http://environmentalrisk.cornell.edu/WNV/**
	National Pesticide Information Network	**http://npic.orst.edu/wnv/introduction.htm**
	New York City Department of Health	**http://www.ci.nyc.ny.us/html/doh/html/wnv/wnvhome.html**
	New York State Department of Health	**http://www.health.state.ny.us/nysdoh/westnile/index.htm**
	University of Illinois Extension	**http://www.ipm.uiuc.edu/wnv/**

American Crows

What Is the Connection Between the West Nile Virus (WNV) and Crows?
WNV can infect virtually any species of bird. When crows are infected they tend to die -- unlike most infected birds, horses or people. Thus, crow deaths may be an indicator of WNV activity in an area. To take advantage of this observation, many states have developed systems to collect selected dead crows for WNV testing.

Why Do Crows Die from WNV?
For reasons that are unknown, a high percentage of crows and blue jays that become infected with WNV develop severe infection, become ill and die. Most birds and humans develop few if any symptoms and only a small percentage develop severe, life threatening infection.

Where Are American Crows Found?
American crows are found throughout central and eastern North America, wintering as far north as southern Maine and the Great Lakes region (including Illinois).

How Can I Identify an American Crow?
American crows are large, black, perching birds with robust beaks and a fan-shaped tail. Both sexes are similar in appearance although females are slightly smaller. Images of crows and blue jays may be found at < http://www.idph.state.il.us/envhealth/wnvsurveillance.htm>.

Are Crows Spreading the Disease to Humans?
Normally, crows and other birds transmit this disease to humans only via infected mosquitoes. However, one should not handle crows or any other type of dead animal with bare hands (see disposal instructions below).

What Should I Do If I Find a Dead Crow?
The Illinois Department of Public Health is advising residents who find dead crows or other large birds (such as geese or hawks) to report this to their local health department during regular working hours. The local health department then may send a representative to pick up the bird or request you dispose of the bird in an appropriate manner.

What If I Am Told to Dispose of the Bird Myself?
Dead birds can be disposed of by picking the bird up with a shovel or a pair of disposable gloves. Also, one can make a pair of disposable gloves by using a heavy-gage plastic bag like a glove. Bury the bird three-feet deep or double bag them and place them with regular trash. Wash your hands when you are done. Check with your local health department for specific instructions.

How Long Do Crows Live?
The average life span of a wild crow is 7-8 years. Captive crows have been known to live up to 30 years.

Do Crows Migrate?
American crows can be considered partially migratory. They can make rather long daily movements but do not need to migrate for long distances. Crows will migrate out of areas when the winter temperature averages approximately zero degrees Fahrenheit. Most crows remain all winter in more temperate winter climates.

How Far Can Crows Travel During a Day?
As noted above, crows can travel rather long daily distances. Daily distances of up to 50 miles are common and distances of 100 miles have been documented.

Why Do Crows Congregate (Roost) in Large Numbers?
For crows, large roosts are primarily a fall and winter phenomenon. Numbers peak in winter then decrease in March as the breeding season approaches. It appears crows gather together at winter roosts, even territorial breeding crows. Most theories suggest crows roost together because it provides protection from predators and they don't mind congregating in large numbers as some birds do.

When Do Crows Mate?
Early spring (March) is when crows usually court and mate. After mating, females build a nest in 5 to 13 days against the trunk of a tree at heights ranging from 6 to 60 feet above the ground.

Note: Extracted and slightly modified from Connecticut Department of Environmental Protection, August 2000.

Licensing Requirements for Mosquito Pest Control

Persons applying pesticides for mosquito control are ***certified (licensed) by the Illinois Department of Agriculture.*** The Illinois Department of Public Health acts in an advisory and informational role in the area of mosquito control. The Department does not regulate mosquito control applicators or the insecticides used in mosquito control. Specific inquiries about mosquito pesticides should be directed to the Illinois Department of Agriculture.

General Standards (Operator) Exam: All persons must pass this exam on the safe use of pesticides. Study materials (**Illinois Pesticide Applicator Study Guide**) may be obtained from your University of Illinois Extension county office or call 800-644-2123.

Category (Applicator) Exam: At least one person in an organization must have an applicator license. One must pass the General Standards Exam before taking the Mosquito Control Applicator Exam. Study materials for the Mosquito Pest Control Exam may be obtained from your University of Illinois Extension county office or call 800-644-2123.

Limited Licensing for Mosquito Larviciding: In 2003, a rule established by the Illinois Department of Agriculture allows applicators with a mosquito abatement license to train new personnel themselves, provided the application method is limited to placing a solid product pre-packaged by the manufacturer for the control of mosquito larvae in a specific treatment area. Applications of other agents used for control of mosquito larvae and pesticides targeting adult mosquitoes must be conducted only by applicators and operators licensed by the Illinois Department of Agriculture through the traditional testing and certification program. Please contact the Department of Agriculture for more information.

Testing: A limited number of training sessions for mosquito pest control will be held each spring. **Preregistration** is now required for all clinics. Otherwise, exams must be taken at the Department of Agriculture offices listed below. To make an appointment call 800-641-3934, or in Springfield, 217-785-2427, or in Des Plaines, 847-294-4343.

Selected References

"Epidemic / Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention and Control" - Centers for Disease Control and Prevention
"Michigan Mosquito Control Manual" - Michigan Department of Community Health
"Morbidity and Mortality Weekly Reports" - Centers for Disease Control and Prevention
"Standard Operating Procedures for Michigan Arbovirus Emergencies" - Michigan Department of Agriculture
"Surveillance and Control of Selected Arthropod-borne Diseases in Florida" - Florida Department of Health

"West Nile Virus Outbreak: Lessons for Public Health Preparedness" – U.S. General Accounting Office
"West Nile Virus Response Plan" - New York State Department of Health
"West Nile Virus Response Plan" - Metropolitan Washington Council of Governments Regional Health Officers Committee

Public Information about Mosquito-borne Viruses

Introduction

Included in this section are a number of sample news releases and public service announcements designed to provide the user with a quick reference and examples for response to the public concerning mosquitoes and mosquito-borne diseases. The example documents are intended for use by local health departments and other local organizations as an aid for developing information for distribution to the public.

Preinterview Questions for Local Health Department Staff

Review Question		Brief Response
1	Can mosquito bites be dangerous to human health?	Yes, some types of mosquitoes can carry diseases such as West Nile virus (WNV), St. Louis encephalitis (SLE) and La Crosse encephalitis (LAC). Some individuals can develop a severe allergy to mosquito bites.
2	*What kinds of disease can mosquitoes transmit to man and animals?*	In Illinois, encephalitis can be transmitted to people, WNV to people, horses and birds and heartworm to dogs.
3	*Do all kinds of mosquitoes carry disease?*	There are about 50 species of mosquitoes present in Illinois. The house mosquito and the tree-hole mosquito are the most important vectors of disease to humans.
4	*How does encephalitis affect adults and children?*	For most people, mosquito-borne diseases produce a very mild flu-like illness. However, people older than 50 years of age are more likely to become severely ill from SLE and WNV. Symptoms range from headache and fever to more severe illness. Children are more likely to be adversely affected by LAC, but it is rarely fatal.
5	*Are all types of encephalitis viruses carried by mosquitoes?*	No, encephalitis is a generic term for inflammation of the brain. Some viruses can cause encephalitis by personal contact. Only appropriate laboratory testing can determine if the illness was caused by a mosquito-borne virus.
6	*Does encephalitis make domestic animals ill?*	Horses can become ill or die from diseases such as eastern equine encephalitis (EEE), western equine encephalitis (WEE) and WNV. Dogs and cats appear to be very resistant to mosquito-borne encephalitis.
7	*What does dog heartworm do to dogs?*	Heartworms enter the blood when a dog is bitten by an infected mosquito. The parasites multiply then move to the heart. Dogs can become weak, anemic and die.

8	*What are the mosquito-borne diseases that we should be aware of in this area?*	WNV and SLE can occur anywhere in Illinois. LAC may also be of concern, but you should check with authorities in your region.
9	*Were any of these infections found last year or this year?*	This information is available from the IDPH Web site. Check for information on your region.
10	*Are we part of any mosquito control district or does the city conduct a mosquito control program?*	Your local health department should be able to tell you about mosquito control programs in your area.
11	*How does a mosquito control district function and can it reduce the number of mosquitoes in the area?*	An established Mosquito Abatement District (MAD) keeps records and maps, some going back many years, enabling them to locate, survey and treat potential breeding sites using the best methods available.
12	*How do mosquito control programs control larval and adult mosquitoes?*	Products are used to treat water in ponds, storm drains, etc., where mosquito larvae are found or may develop later. Ultra low volume sprays are used at critical times and locations to help control adult mosquitoes.
13	*How should the public respond to spraying for adult mosquitoes?*	When used according to label directions, these products pose little risk to the public. Do not approach trucks when spraying is taking place. Persons with allergies or asthma may want to close their windows.
14	*Would such a program have any adverse effects on the environment or on other insect and animal populations?*	If used according to label directions, the EPA-registered general use insecticides for mosquito control have minimal impact on the environment.
15	*Are there mosquito control programs in other parts of the county?*	Yes, some have been established for many years.
16	*What about controlling mosquitoes in wetlands and swamps? Would it be necessary to drain them?*	There are methods appropriate for sensitive areas such as wetlands. Other control strategies have been used when swamps pose a problem.
17	*Where do the mosquitoes living in cities and towns come from?*	Many are produced in water-filled containers like old tires, improperly maintained swimming pools, and street catch basins, where mosquito eggs are laid.
18	*Does one have to be licensed to spray for mosquitoes?*	Yes, anyone that sprays for mosquitoes must be licensed by the Illinois Department of Agriculture. There are two exceptions: spraying one's own residential property and tire dealers using designated pesticides.
19	*How can I protect myself from mosquito bites?*	Many personal protection measures can be employed: wear protective clothing, use repellents, maintain window/door screens and limit outdoor activities, especially after dark.
20	*What else can I do?*	You can eliminate mosquito breeding sites on your property by periodically emptying water from containers such as bird baths, buckets, tires, gutters, etc. Report dead crows or blue jays to your local health department.

Example IDPH News Releases and Public Service Announcements

The following can be used by local health department staff to prepare for a news media interview.

News Releases:	http://www.idph.state.il.us/envhealth/wnvnews.htm
Public Service Announcements (Radio/Television):	http://www.idph.state.il.us/envhealth/wnvgenpublic.htm

Evaluation of St. Louis Encephalitis Public Information Efforts in Florida

From Surveillance and Control of Selected Arthropod-borne Diseases, 2000
Florida Department of Health

During the summer of 1997, activity among sentinel chicken flocks indicated the potential for widespread human cases of St. Louis encephalitis (SLE). Because personal prevention of mosquito bites is known to reduce the risk of arboviral infection, the Department of Health (DOH), county health departments and mosquito control agencies undertook many activities to more adequately inform the public about the prevention of this dangerous disease.

Three main public health messages were widely disseminated. The public was warned to: (1) minimize outdoor activities from dusk to dawn; (2) but, when outdoors during these hours, cover up with clothing; and (3) use mosquito repellents, as directed, on exposed skin. To draw attention to the potential danger and reinforce suggested preventive measures, the DOH issued a medical alert for 27 central and southern Florida counties. Significant media attention was generated by this alert and was used by the department both to reiterate the preventive messages and to communicate current viral activity in humans and chickens. During the season, nine cases of human illness, including one death, were recorded.

In an attempt to assess the effectiveness of the DOH's media campaign, several questions were appended to the Behavioral Risk Factor Surveillance System surveys for November and December [the alert was in place from August through mid-December]. Results of the survey follow: A total of 468 persons completed the SLE section of the survey, of which 184 were male and 284 were female. The mean age of respondents was 51 years. There were 286 respondents who lived in a county that had been placed on SLE alert. There were no differences between alert and non-alert counties with respect to age, sex or race/ethnicity. Respondents were asked if they currently took any precautions to prevent mosquito bites. Of those answering the survey, 67 percent in alert counties and 51 percent in non-alert counties reported currently taking precautions (p=0.001). In alert counties, 93 percent of respondents reported having heard (or read) SLE messages, compared to 75 percent in non-alert counties (p=0.001). Of those who received SLE messages, 72.5 percent used some kind of anti-mosquito precaution compared to 45.3 percent of those who did not receive SLE messages (p=0.001). Television and newspapers were the most common sources of information on SLE. There were 86 percent of respondents in alert counties and 74 percent in non-alert counties who reported receiving SLE information from television (p=0.002); and 55 percent of respondents in alert counties and 39 percent in non-alert counties who reported receiving information from the newspaper (p=0.003). Of respondents who reported receiving SLE information, 41 percent reported taking additional precautions against mosquito bites after hearing the messages. In alert counties this number was 49 percent, and in non-alert counties, 27 percent took additional precautions (p=0.001). The most common preventive measures included the following: limiting outdoor activities (45.8% in alert counties versus 17.6% in non-alert counties, p=0.001); wearing insect repellent (44.8% in alert counties vs.

38.5% in non-alert counties, p=0.2); and wearing long pants and long sleeves (26.9% in alert counties vs. 10% in non-alert counties, p=0.001).

Widespread dissemination of these important preventive messages did not require large expenses for media air time or print space by public agencies, but seemed to have been widely heard and practiced. Press releases, Web sites, toll-free hotlines and interviews with media representatives were commonly used to increase awareness of the message. These efforts probably prevented a large amount of morbidity as well as mortality during the 1997 SLE season and could be applied to other vector-borne diseases.

Example of IDPH News Release

June 11, 2004

Birds from Five Counties Positive for West Nile Virus

SPRINGFIELD, Ill. – Dead birds collected in five northern Illinois counties have tested positive for West Nile virus, Dr. Eric E. Whitaker, state public health director, today announced.

The birds were found either Tuesday or Wednesday in Boone, Kankakee, Lake, Ogle and Rock Island counties and confirmed positive today by the Illinois Department of Agriculture Laboratory in Galesburg. A total of 20 birds in 15 counties have now been confirmed positive for West Nile virus in Illinois since state and local health departments began surveillance for the mosquito-borne disease on May 1. No human cases have been reported.

Other positive birds have been reported in the following counties: Adams, Champaign (2), DuPage (2), Kane, Madison (2), McHenry, McLean (2), Stephenson (2), Vermilion and Winnebago. In addition, two mosquito pools in DuPage County have been confirmed positive for West Nile.

In 2003, 75 of the state's 102 counties had a West Nile positive bird, mosquito, horse or human. A total of 54 human cases of West Nile disease, including one fatality, were reported last year in Illinois. In 2002, the state led the nation with 884 human cases and 66 deaths, and West Nile activity was reported in 100 of 102 counties.

Surveillance for West Nile virus includes collecting dead crows and blue jays. Citizens who observe a sick or dying crow or blue jay should contact their local health department, which will determine if the bird is to be picked up for testing.

WNV is transmitted through the bite of a mosquito that has picked up the virus by feeding on an infected bird. Most people with the virus have no clinical symptoms of illness, but some may become ill three to 14 days after the bite of an infected mosquito.

West Nile infections can be mild and include fever, headache and body aches, or can be severe and marked by headache, high fever, neck stiffness, stupor, convulsions, muscle weakness, paralysis and, rarely, death. Serious West Nile virus illness is most often present in individuals 50 years of age or older.

Dr. Whitaker said individuals can reduce their risk of West Nile disease and other mosquito-borne diseases by taking these precautions:

* Avoid being outdoors when mosquitoes are most active, especially between dusk and dawn.
* When outdoors, wear shoes and socks, long pants and a long-sleeved shirt, and apply insect repellent that includes DEET according to label instructions. Consult a physician before using repellents on young children.

* Make sure doors and windows have tight-fitting screens. Repair or replace screens that have tears or other openings.
* Eliminate all sources of standing water that can support mosquito breeding, including water in bird baths, ponds, flowerpots, wading pools, old tires and any other receptacles.

Additional information about West Nile virus can be found on the Department's Web site at : www.idph.state.il.us/envhealth/wnv.htm or people can call the Department's West Nile virus hotline (866-369-9710) Monday through Friday from 8 a.m. to 5 p.m.

Draft News Releases

Local Health Department News Bulletin - Template A
(Risk Level 1)

Residents Encouraged to Help Eliminate Mosquito Breeding Places

Village health officials are asking residents to be more conscious this year of the need to eliminate mosquito-breeding places around their homes. "We are more concerned about mosquitoes this year than in the past." said {local health department official}. "We are concerned about any sign that the {West Nile Virus or other arbovirus}, which can be transmitted by mosquitoes to humans, has been detected in Illinois. We would encourage residents to be on the lookout for small pools of water in discarded tires, ditches, tarps covering firewood and similar locations that could be breeding grounds for mosquitoes," said {local health department official}. "Taking away those easy targets will help limit the reproduction of mosquitoes and help prevent the mosquito population from impacting our summer quality of life."

The house mosquito (*Culex pipiens*) is known to have transmitted the virus to humans after ingesting the virus from infected birds. "Since 2002, the West Nile virus has been responsible for cases of illiness and death in Illinois and surrounding states," noted {official}. "Because the virus continues to be detected in Illinois, we want to monitor the situation closely each year. Most birds simply carry the virus, but crows and blue jays are particularly vulnerable to the virus. Should a citizen find a dead crow or blue jay that appears to have died as the result of natural causes, we would ask that the citizen call the {local health agency at telephone number}."

The {West Nile} virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, in relatively rare instances, death.

Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease. Dogs and cats can be infected with the virus the same way as humans, but those animals are apparently very resistant to the virus. Animals cannot transmit the disease to other animals or humans.

Local Health Department News Bulletin - Template B
(Risk Level 4)

Health Officials Ask Citizens to Protect Themselves from Mosquito-borne Encephalitis

County health department officials are asking citizens to take appropriate action to protect themselves from mosquitoes carrying {West Nile Virus or other arbovirus}. A confirmed case of {West

Nile or St. Louis} encephalitis has been identified in the region. The individual is being treated {at an area hospital}. {General comment on patient's condition}. The virus causes encephalitis, which is an inflammation of the brain. Mild symptoms associated with the virus include fever, head and body aches, often with swollen lymph glands. More severe infection is marked by headache, high fever and neck stiffness, which can progress to stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, in relatively rare instances, death. Treatment involves intensive supportive therapy for more severe cases. Elderly people are more susceptible to the virus than younger age groups. There is no vaccine to prevent contraction of the disease.

Citizens are encouraged to stay indoors at dawn and dusk through early evening when mosquitoes are most active. Individuals should wear long-sleeved shirts and long pants when going outdoors. An insect repellent should be used on exposed skin and on thin clothing in accordance with the manufacturer's directions for use. Effective repellents will contain 20-30 percent DEET. Repellents with higher concentrations of DEET can cause side effects, especially in children. Avoid putting repellent on the hands of younger children, as they may irritate the eyes and mouth. Also, fine-mesh screens should be used on windows and doors. The mosquitoes that carry the {West Nile or St. Louis encephalitis} virus breed in standing water. Citizens should eliminate mosquito-breeding sites around the home. Water in bird baths, flowerpot trays and outside pet water bowls should be changed every few days. Also, water in roof gutters, wading pools, trash cans, tires and low spots on tarps over firewood and boats should be eliminated.

The {West Nile or St. Louis} virus is transmitted to humans by mosquitoes that have ingested the virus from infected birds. Many bird species carry the virus, but crows and blue jays are particularly vulnerable. Additional information is available in a brochure entitled "Mosquitoes and Encephalitis" which is available from the {local health department}.

Local Health Department News Bulletin - Template C

Cities Can Help with Mosquito Control

"The mosquito season will soon be here," said (Name), director of the (Health Department). "Not only are mosquitoes a pesky nuisance," he or she added, "but they are potential carriers of West Nile virus or St. Louis encephalitis."

(Name) offered the following suggestions for area municipalities wanting to control mosquitoes. All actions are related to removing stagnant water as mosquitoes breed in this kind of environment. (Name) said every seven to 10 days a new hatch of mosquitoes can be produced in an area of stagnant water.

Measures that can be taken follow:
(1) Roof gutters and flat roofs of buildings are areas which should be kept clean and drained to prevent mosquito breeding;
(2) Community cleanup campaigns should stress the removal of any type of containers where mosquito breeding can occur;
(3) Bodies of water such as roadside ditches, creeks, and rivers should be kept free-flowing with steep, smooth shores, little or no vegetation and no stagnant side pockets;
(4) Weeds should be trimmed along roadside ditches and creeks;
(5) Tree holes accumulating water are common mosquito breeding sites. Such holes can be drilled so they will drain or can be filled with sand or another material such as rock wool;*
(6) Sewage lagoons at community sewage treatment plants should be checked for the presence of larvae from mid-June through September;
(7) Swimming and wading pools should be properly maintained; and
(8) Storm sewer catch basins should be checked to determine if they hold pooled water and if larvae are present from mid-June through September. If larvae are present, then a larvicide should be applied. A larvicide should also be used for ornamental ponds and pools and woodland ponds that

produce mosquito larvae.

(Name) reminded, too, that the responsibility for helping to control mosquitoes is not solely that of the community. Every individual can help by remembering that stagnant water might be in a public park or a child's wading pool at home.

* Rock wool is insulating cement that is available at building supply stores. This material is pliable when dried and will not crack with the movements of the tree.

Local Health Department News Bulletin - Template D

Mosquito Control Begins at Home

(MAIN OFFICE CITY)- - (Name), director of the (Local Health Department), is concerned that mosquito-borne encephalitis be prevented to the fullest extent possible this summer.

In keeping with this concern, (Name) today reminded the public that mosquito control is the answer to the problem, and mosquito control begins at home.

(Name) listed numerous things residents can do around their homes to help reduce mosquitoes, especially the removal of stagnant water where mosquitoes breed:

- Get rid of old tires, tin cans, bottles, jars, buckets, drums and other containers where water collects.
- Fill in tree holes with cement.
- See that cisterns, cesspools, septic tanks, fire barrels, rain barrels and tubs in which water is stored are tightly covered.
- Empty and thoroughly wash bird baths and plastic wading pools once each week.
- Dispose of old tires.
- Repair leaky pipes and outside faucets.
- Keep eaves and drain gutters cleaned and unclogged so water runs off properly and dissipates.
- Empty, clean and refill watering pans for pets and chickens daily.
- Examine flat roofs after rains to be sure no water remains standing on them.
- Drain stagnant puddles.
- Keep weeds and shrubs trimmed and the lawn mowed.
- Drain and clean rock garden pools once each week or keep small fish in them.

Local Health Department News Bulletin - Templates E & F
Public Service Announcements

Television

VIDEO	AUDIO
"Fight the Bite!" slide director's name health department name and phone number across the bottom.	Mosquitoes are a nuisance . . . and a health menace! Get helpful information on how to control them. Call the (Health Department) and help "Fight the Bite!"

Radio

(10 Seconds, 20 Seconds or 30 Seconds)

Announcer: This is the mosquito season. The (Health Department) cautions that mosquitoes breed in standing water. So check your yards and neighborhood to eliminate anything that holds water. Mosquitoes are not only a nuisance, they can carry disease.

Announcer: (County) does not have a mosquito control program, but the (Health Department) has helpful information on what you can do to "Fight the Bite!" Contact the (Health Department) at (phone number) for helpful information on what you can do to control mosquitoes in your yard and neighborhood.

Announcer: The mosquito season is here. Mosquitoes are a nuisance, but more than that, they can transmit disease. Encephalitis is of particular concern to (County) health authorities. Mosquitoes breed in standing water. Clean out roof gutters, change the water in bird baths at least weekly, and cover or eliminate any item that could hold water. Standing water can produce a new hatch of mosquitoes every seven to 10 days. Do your part to "Fight the Bite!"

Announcer: When encephalitis is present in the area's bird population, there is always the danger that humans may contract the disease from mosquito bites. So, as best you can, avoid being bitten by mosquitoes. The (Health Department) offers these suggestions: Use caution when out-of-doors, particularly in evening hours. Wear clothing that protects you as much as possible, and use a mosquito repellent on areas of exposed skin. If your residence has any screens that are defective, have them fixed. Such precautions should be continued until after the first hard freeze of fall.

Part VI. Appendices

Appendix 1.

Collection and Submission of Dead Birds for West Nile Virus Testing

Crows and blue jays continue to be good sentinels for detecting the presence of WNV activity in a geographic area because of their susceptibility to the virus. Each year, Illinois Department of Public Health requests that local health departments assist with "dead bird" (crows or blue jays ONLY) reports as part of the WNV surveillance effort. Each year, local health departments will be the lead agencies in the coordination of this effort from May 1 through October 15. Citizens who observe dead crows or blue jays should contact their local health department during regular business hours. Please note that not all dead crows and blue jays will be collected for testing. For a list of local health departments, see: **<http://www.idph.state.il.us/local/map.htm>.**

Appendix 2.

IDPH Vector Control / Arbovirus Staff, Division of Environmental Health

Office	Supervisor	Vector Personnel
Central (Springfield) 217-782-5830	Gary Flentge, Chief, Environmental Health Division	Linn Haramis, Ph.D., Program Manager Curt Colwell, Ph.D., Entomologist

Champaign Region 217-278-5900	Mark Kuechler, Regional Office Supervisor	None
Edwardsville Region 618-656-6680	Michael Hungerford, Regional Office Supervisor	Position vacant
Marion Region 618-993-7010	Walter Ward, Regional Office Supervisor	Gary Patschke
Peoria Region 309-693-5360	John Smet, Regional Office Supervisor	Jack Swanson
Rockford Region 815-987-7511	Clay Simonson, Regional Office Supervisor	None
West Chicago Region 630-293-6800	Joe O'Connor, Regional Office Supervisor	Emanuel Wilder (Supervisor); Barbara O'Meara and Samuel Davis

Appendix 3.

Mosquito Control and Prevention of West Nile Viral Encephalitis for Municipal Governments and Local Health Departments

During 2002, an outbreak of mosquito-borne West Nile virus in Illinois resulted in 884 cases and 66 deaths. The appearance of West Nile virus (WNV) cases in Illinois required local health departments to expend many staff hours responding to inquiries by concerned citizens. Additionally, there was intense interest in the issue on the part of the news media. In response to the 2002 outbreak, many communities conducted or enhanced mosquito control operations. Anecdotally, areas in Cook County that had existing mosquito control programs with especially intensive mosquito **LARVICIDING** efforts had fewer human cases than those areas that had less intensive efforts or no larviciding at all. Consequently, Illinois Department of Public Health (IDPH) staff believe local governments that conduct mosquito control programs should emphasize the methods most effective at controlling the primary mosquito vectors (carriers) of WNV and a related disease, St. Louis encephalitis virus. Additional information about WNV and mosquito control may be found on the Department's Web site: < http://www.idph.state.il.us/envhealth/wnv.htm > and on the Web sites listed on pages 3 and 4.

Please be aware that all personnel who do pesticide applications for mosquito control must be licensed by the Illinois Department of Agriculture (IDA). The only exceptions are homeowners who treat their own residential property for mosquitoes and tire recycling companies that use certain pesticides to treat water-filled used tires. Please contact the IDA at 800-641-3934 or 217-785-2427 for more information about mosquito control licensing.

Control of the Primary West Nile Virus Mosquito Vector

Control of Culex Larvae is a Priority. Although WNV has been detected in several species of mosquitoes, about 70 percent of the positive samples have been from *Culex pipiens* (the house mosquito) and related species of *Culex*. The house mosquito breeds most prolifically in stagnant water that has a heavy organic content. In urban areas, catch basins, artificial water-filled containers like used tires and poorly draining ditches are common production sites for *Culex* mosquitoes. Additionally, ***most of the house mosquitoes present in a community are produced locally*** because the house mosquito does not fly more than about one to two miles from its production site. In contrast, inland floodwater mosquitoes (*Aedes vexans*) can fly 10 or more miles from where they hatch, particularly along prevailing winds. Although floodwater mosquitoes can be a nuisance to the public when they are

abundant, they have not been significant disease carriers in Illinois and are currently believed to be minor carriers of WNV.

The most effective method of mosquito control is larviciding or the treatment of locations where mosquito larvae are present, such as the water impounded in the bottom of catch basins (storm drains). Catch basins may be found along streets, in parking lots and sometimes in backyards. Because catch basins are a major breeding site of the house mosquito in urban areas, the Department recommends that they be treated at least twice during the summer to control *Culex* mosquitoes. Ideally, municipalities should treat catch basins and other locations that produce *Culex* mosquitoes as often as determined by necessary inspection and according to insecticide label directions. (Please see Table 1 for a list of mosquito larvicides.) However, ***a minimum response*** by a municipality would be to treat catch basins and other *Culex* production sites twice during the summer (June and July). This would reduce numbers of ***vector*** mosquitoes during late summer, the period of greatest risk for humans. Local officials should review the references about mosquito control found in Table 2, particularly the *Joint Statement on Mosquito Control* and *Integrated Methods of Mosquito Control*, issued by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency (U.S. EPA).

Spraying for Adult Mosquitoes: Adult mosquito control (also called fogging, spraying or adulticiding) is the mosquito control method that is most familiar to the public. However, the aerosol fog kills only mosquitoes that contact insecticide droplets and the fog soon dissipates. Although the local mosquito population is reduced for a few days, fogging does not prevent mosquitoes from re-entering the area. Because only a part of the local adult mosquito population is reduced for a few days by fogging, municipalities should give priority to larval mosquito control of *Culex* mosquitoes. Nonetheless, when the risk of human disease is present, the only method that will reduce the population of ***WNV-infected*** mosquitoes throughout a community is adulticiding. Treatment for control of WNV-infected adult mosquitoes is a valid and legal option for local officials to employ as a supplement to larviciding.

To be effective, spraying for adult mosquitoes MUST be conducted when suitable environmental conditions are present. Fogging for adult mosquitoes should ONLY be conducted at the proper time (evening or early morning) and under appropriate environmental conditions (such as temperatures from 60 to 85 degrees Fahrenheit and low wind speeds). For ultra-low volume (ULV) spraying units to control mosquitoes, they MUST be serviced so they produce a proper droplet size spectrum. Please consult the pesticide label and manufacturer's recommendations for further information.

Every effort should be made to inform the public when treatment for adult mosquitoes is planned. An informed public will better understand the measures being taken and will be able to take precautions to limit exposure to pesticides.

Nonchemical Mosquito Control. Mosquito larvae or "wrigglers" must live in still water for five or more days to complete their growth before changing into adult biting mosquitoes capable of transmitting disease. Often, the number of mosquitoes in an area can be reduced by removing sources of standing water around residences. For example, hundreds of mosquitoes can come from a single discarded tire. Local agencies should inform the public how to prevent mosquito production around residences and to prevent mosquito bites:

1. Get rid of old tires, tin cans, buckets, drums, bottles or any water-holding containers.
2. Fill in or drain any low places (puddles, ruts, etc.) in the yard.
3. Keep drains, ditches and culverts free of weeds and trash so water will drain properly.
4. Keep roof gutters free of leaves and other debris.
5. Cover trash containers to keep out rainwater.
6. Repair leaky pipes and outside faucets.
7. Empty plastic wading pools at least once a week and store indoors when not in use.
8. Unused swimming pools should be drained and kept dry during the mosquito season.
9. Fill in tree rot holes and hollow stumps that hold water.
10. Change the water in birdbaths, plant pots or drip trays at least once each week.

11. Store boats covered or upside down, or remove rainwater weekly.
12. Make sure ornamental ponds have fish that will eat mosquito larvae.
13 Repair window screens.
14. When outdoors in the evening or when mosquitoes are biting, use personal protection measures to prevent mosquito bites (proper use of insect repellent and appropriate clothing). See the Department's Web site for specific personal protection recommendations.

In summary, local agencies that conduct mosquito control should give highest priority to eliminating breeding sites and to larviciding. Elimination and treatment of *Culex* mosquito production sites will help municipalities protect Illinois citizens from mosquito-borne West Nile virus. For additional technical information about mosquito control, contact the Illinois Department of Public Health, Division of Environmental Health at 217-782-5830 or E-mail < mailus@IDPH.state.il.us >. Questions concerning licensing for mosquito control or inquiries about the legal aspects of pesticide use should be directed to IDA at the telephone numbers listed on the first page.

Table 1. Mosquito Larvicides Commonly Used in Illinois [1]

Note: Mosquito larvicides with methoprene or *Bacillus sphaericus* as the active ingredient have been found to be particularly effective for control of *Culex* mosquito larvae in catch basins.

Larvicide	Type	Action	Primary Use
Abate^{R} (Temephos)	Organophosphate	Directly toxic	Tires, containers, floodwater sites
Altosid^{R} (Methoprene)	Growth regulator	Prevents larvae from developing to adults	Catch basins, containers, floodwater sites
Bacillus thuringiensis israelensis (Bti)	Bacterial	Gut toxin	Floodwater, catch basins
Bacillus sphaericus (Bs)	Bacterial	Gut toxin	Catch basins, septic waters (for ***Culex***)
Oils (Golden Bear^{R} and BVA^{R}) [2,3]	Surface treatment	Suffocation: film covers air tubes of larvae	Floodwater, catch basins, septic waters

[1] Always read and follow all current pesticide label instructions. If any information in these recommendations disagrees with the pesticide label, the label instructions must be followed. Use of a product name does not constitute product endorsement. All pesticides must be registered with U.S. EPA and the IDA.
[2] Monomolecular film larvicide (Agnique^{R} , an alcohol-derived product) that acts like an oil larvicide has become available recently.
[3] All oils used as larvicides must be registered with U.S. EPA and the IDA.

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