DEPARTMENT OF
PUBLIC HEALTH AND WELLNESS

OFFICE of EMERGENCY and PUBLIC HEALTH PLANNING

ZIKA RESPONSE PLAN

JUNE 14, 2016

Executive Summary

On March 8, 2016 the Centers for Disease Control & Prevention published guidelines for the development of state and local risk-based Zika action plans. The Zika Virus Disease Response Plan will leverage the powers of state, local, and federal governments and the private and non-profit sectors to meet public health needs in response to the dynamic and evolving threat of Zika in in the Louisville Metro jurisdiction.

Zika is a mosquito-borne virus that is primarily transmitted to people through the bite of an infected *Aedes sp.* mosquito vector. It is in the same virus family which also includes chikungunya, dengue and yellow fever. Zika was first isolated in Uganda in 1947 and caused sporadic human cases in Africa and Southern Asia from the 1950s to 2000s. In 2007, an outbreak occurred on Yap Island of Micronesia which later spread to surrounding Pacific Islands in 2013-2014.

In May 2015 the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed local transmission cases of Zika Virus Disease (Zika) infection in Brazil. Subsequently, outbreaks are now occurring in many countries across the Americas. Although Zika infection rarely leads to severe illness, it has been found to cause birth defects such as microcephaly and has been associated with the neuromuscular disorder Guillain-Barré syndrome. In response to this outbreak, the World Health Organization declared the Zika a Public Health Emergency of International Concern on February 1, 2016.

As of May 20, 2016 there is no local transmission of Zika virus reported in the U.S., however travel-related cases have been reported in most states including Kentucky. The Zika Response Action Plan provides guidelines for preparation and response to the virus in the LMPHW jurisdiction. The Plan provides direction for the prevention and mitigation of Zika virus in the Louisville Metro area and discusses the Zika virus Operational Design in five (5) phases: Preparedness, Local Mosquito Confirmation, Local Human Confirmation (single/multiple instance), Widespread Local Human Confirmations, and Widespread Regional Outbreak. Each phase represents an escalation in scope and effort based upon these pre-defined trigger points. All phases incorporate the components of Community Engagement, Surveillance, Laboratory Testing, Vector Control, Pregnancy Outreach, and Blood Safety.

Zika virus is a newly emerging virus and recent scientific information is continually becoming available. This document will be updated regularly to reflect additional information from peer-reviewed research, the Centers for Disease Control and Prevention (CDC), and other relevant organizations. More information is regularly becoming available at www.cdc.gov/zika.

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I. Purpose, Authority, and Scope:

A. Purpose: This document describes actions that will be taken as the risk of locally acquired (transmitted by the bite of a local vector) cases of Zika virus disease increases in Kentucky and more specifically within the Louisville Metro jurisdiction. The response to Zika will be phased based on changing conditions in the local environment. The organization of this plan is based on the Centers for Disease Control and Prevention's (CDC) "Public Health Response Plan for Areas at Risk for Local Zika Virus Transmission and High Volume of Travel Associated Cases."

B. Authority: The Louisville Metro Board of Health, Louisville Metro Director of Health and Louisville Metro Public Health & Wellness are charged in KRS 212 with the responsibility for all matters relating to the protection of the health of the public.

C. Scope:

1. This plan is consistent with and supports the Kentucky Department of Public Health Zika Virus Disease Concept of Operations (currently in draft) and Centers for Disease Control and Prevention (CDC) guidance, available at http://www.cdc.gov/zap/pdfs/action-plan/zika-action-plan_3-10-16.pdf. The plan will be utilized in concert with the Louisville Metro Public Health and Wellness (LMPHW) Emergency Operations Plan (EOP) and, as needed, the Louisville Jefferson County Emergency Management Agency (LJCEMA) Emergency Operations Plan to facilitate and enhance County-level coordination.

2. Public outreach and education, as well as surveillance and epidemiological investigation, will be among the most important strategies for preventing or mitigating the spread of Zika. Other activities may require large-scale efforts and may involve multiple Emergency Support Functions (ESFs). Activities that may be implemented during Zika response include but are not limited to:

- Coordination with state, regional and local entities and mosquito control organizations
- Epidemiological surveillance, investigation, and laboratory testing
- Mosquito surveillance and control
- Analysis of Zika surveillance data to inform the development of objectives and strategies
- Development and dissemination of guidance information for the medical community, responders, schools, special populations, public safety officials, and the general public
- Designation of "Areas of Active Zika Transmission," if necessary
- Coordination of community clean-up events to reduce mosquito habitats or breeding sites

II. Situation:

A. Threat and Hazard Analysis

1. Zika is spread to people primarily through the bite of an infected *Aedes sp.* Mosquito Primary vector *Aedes aegypti*; secondary vector *Aedes albopictus.*

2. Researchers detected Zika virus for the first time in *Aedes albopictus* (Mexico; Apr 29, 2016)

3. Zika has also been documented as spreading through cases of sexual transmission and from mother to fetus

4. Symptoms include fever, rash, joint pain and conjunctivitis (red eyes) but rarely requires hospitalization or death

5. First reported fatality in Puerto Rico (Apr 29, 2016)

6. Most Zika infections (80%) are asymptomatic with no notable symptoms

7. Zika virus during pregnancy can cause microcephaly and other fetal brain defects

8. In May 2015, there was the first confirmed virus infection in Brazil

9. On January 11, 2016, there was the first Zika case confirmed in Texas (sexually transmitted)

10. CDC Statistics Jan 1, 2015 – Apr 27, 2016:
    a. CONUS – 426 travel related cases/42 states; no locally acquired cases
    b. Hawaii – 7 travel related cases; no locally acquired cases
    c. US Territories – 596 locally acquired cases; 3 travel related cases

11. Zika virus will likely continue to spread to new areas as the summer mosquito and travel season unfolds

B. External Public Health Capability Assessment:

1. The Center for Disease control's EOC was activated for Zika on January 22, 2016 and moved to a level 1 activation (highest level) on February 8. The CDC is currently:

    a. Developing laboratory testing to diagnose Zika.
    b. Conducting studies to learn more about the link between Zika and microcephaly and Guillain-Barré syndrome.

c. Monitoring and reporting cases of Zika, which will help improve our understanding of how and where Zika is spreading.

d. Providing guidance to travelers and Americans living in areas with current outbreaks.

e. Surveillance for the virus in the United States, including US territories.

f. Supporting in Puerto Rico, Brazil, Colombia, American Samoa, the US Virgin Islands, and Panama on the ground.

g. Conducting a study to evaluate the persistence of Zika virus in semen and urine among male residents of the United States

2. As of 25 May 2016, the KDPH State Health Operations Center (SHOC) is operating at a level 3 for Zika Preparedness Efforts.

3. KDPH Maternal and Child Health branch is working with the Kentucky Hospital Association to distribute information about accurately completing birth records and recording head circumference in order to track microcephaly.

4. The KDPH Reportable Disease Branch is fielding information calls from medical providers concerning the Zika disease.

5. As of 25 May 2016, Louisville Metro EOC is not activated and currently operating at a normal level.

6. KDPH Division of Laboratory Services is now able to accept urine specimens, as well as patient-matched serum specimens for RT-PCR testing within 14 days of Zika symptom onset.

C. Facts about the Zika virus:

1. Zika virus infection in pregnant women is associated with birth defects and adverse pregnancy outcomes. Pregnant women represent a highly vulnerable population with special needs.

2. Both the Louisville area and Kentucky are primarily at risk for local transmission of Zika virus by the *Aedes albopictus* (Asian tiger mosquito). The prevalence of the *Aedes aegypti* mosquito (Yellow Fever mosquito) is lower, however, both are competent vectors for Zika virus transmission.

3. CDC is investigating the link between Zika and Guillan-Barré syndrome (GBS), a serious health condition in which an individual's own immune system damages the nerve cells, causing muscle weakness and sometimes paralysis. Symptoms of GBS can last a few weeks or several months. Although most people fully recover from GBS, some people have permanent damage, and people have died in one out of 20 cases.

4. Beginning in May 2015, Zika outbreaks occurred in Brazil. On February 1, 2016, the World Health Organization (WHO) declared Zika virus a public health emergency of international concern.

D. Planning Assumptions:

1. There is a possibility that Zika can be spread through blood transfusion. Zika virus currently poses a low risk to the blood supply in the US.

2. The number of imported cases among travelers visiting or returning to the US will likely increase. These imported cases could result in local spread of the virus in some areas of the US.

3. Local transmission has been reported in many other countries and territories. It is likely that Zika virus will continue to spread to new areas.

4. Kentucky Emergency Management/Kentucky Department for Public Health may have to stand up a Unified Command structure to coordinate the Commonwealth's response to Zika with wide-spread regional outbreaks.

5. A wide-spread regional outbreak of Zika Virus Disease will trigger a Federal and State level of response with LMPHW continuing to focus on cases within the Louisville Metro jurisdiction and coordinating with additional resources for support.

6. The use of pesticides and other agents to control mosquito populations may cause concern about potential damage to the environment or harm to other species.

7. Local governments have the primary responsibility to provide initial emergency response and emergency management services within their jurisdictions.

8. Hospitals and providers in the Louisville metro area can expect an influx of potential Zika cases to clinics and emergency departments due to high level of public anxiety.

9. There will be enormous public interest and concern should one or more confirmed locally-transmitted cases of Zika appear or have the potential to appear in the Louisville Metro area.

10. Regardless of the presence or absence of Zika in Louisville and in Kentucky, there will be increased public interest in mosquitoes and mosquito control this year.

E. Planning Guidance:

1. Knowledge of Zika is improving over time. Guidance and recommendations from CDC will change as more is learned about Zika. Zika planning will need to be continually refined to incorporate new guidance.

2. Mosquito control programs outside of the Louisville Metro area are limited in funding and scope potentially leading to undetected Zika infected mosquito populations in nearby geographical

areas surrounding Jefferson County until a locally positive test result is found. Mosquito control should be guided by surveillance for arboviral disease in humans, mosquito surveillance and arboviral testing of mosquitoes, or by mosquito surveillance only.

3. The Aedes albopictus (Asian tiger mosquito) will not be vulnerable to broad area aerosol spraying. Therefore, surveillance and public outreach will be the most effective tools for preventing or mitigating the spread of Zika.

4. Prevention and mitigation strategies should be part of an integrated mosquito management approach, including public education and outreach, mosquito habitat control, and use of environmentally-friendly larvicide when appropriate and resources permit.

5. LMPHW response efforts will include conducting human disease surveillance, conducting public outreach and education, approving and coordinating human testing, and further investigating identified cases. If a commercial test is developed, there will be less need for LMPHW to coordinate testing but a greater effort in maintaining accurate tracking of confirmed positive cases in the local jurisdiction.

III. Concept of Operations:

A. Intent: It is the intent of LMPHW to serve as the primary agency for the prevention and mitigation of the local transmission of Zika Virus Disease in the Louisville Metro jurisdiction. The Department will monitor the information and escalation of response from one phase to another and will be in collaboration with the health care community, Kentucky Department of Public Health (KDPH), KYEM, LJCEMA, and Louisville Metro government officials in accordance with the pre-defined trigger events defined in the plan. By working with partners at the local and state levels, LMPHW will strive to accomplish the following objectives during the 2016 mosquito season:

B. Objectives:

1. Reduce/eliminate/prevent the spread of the Zika virus through community involvement in enhanced mosquito abatement activities (Lead PIO)

2. Improve and adapt the local surveillance capacity (Lead Environmental Health Specialist/Mosquito Control supported by Epidemiology)

3. Develop a local laboratory testing capability and enhance the capacity to test for the Zika virus in mosquitoes (Lead Laboratory Technical Director)

4. Conduct vector control activities and reduce the *Aedes aegypti* and *Aedes albopictus* mosquito population in targeted areas (Environmental Health Specialist/Mosquito Control)

5. Decrease risk of the Zika virus to pregnant women and women of reproductive age (Lead PIO supported by the Community Health Manager – Clinical Services)

6. Safeguard the local blood supply (Lead Environmental Health office of Emergency and Public Health Preparedness)

C. Triggering Events/Phases: Zika-related preparedness, prevention, response, and mitigation actions addressed in this plan will occur in five risk-based phases:

- Phase 0 - Preparedness;
- Phase I – Local Zika positive mosquito confirmation;
- Phase II - Confirmed local transmission (single/multiple patients);
- Phase III - Widespread local transmission; and
- Phase IV - Widespread regional transmission.

D. As an organizational method, the Prevention, response, mitigation, and recovery efforts will be organized into the following categories:

1. Community Engagement
2. Surveillance (Human and Mosquito)
3. Laboratory Testing
4. Vector Control
5. Outreach to Pregnant Women
6. Blood Safety

E. Efforts in each phase will build on and may occur concurrently with efforts in subsequent phases. Each phase has a pre-defined trigger event to identify escalation to the next phase. Based on the situation, some phases may be skipped in order to more rapidly and efficiently respond to the unfolding Zika threat. Administrative activities, training, and exercises may occur throughout each phase as well.

G. Phase 0: Preparedness: Phase 0 is currently underway and will advance to the next phase upon confirmation of a Zika positive mosquito in the local surveillance area or confirmation of a locally acquired human Zika infection (immediate escalation to Phase II). Most Zika-related efforts will be preventive or in preparation for confirmed locally-transmitted cases. The LMPHW Mosquito Control Program will commence the active surveillance and treatment as established in the LMPHW Environmental Division; Mosquito Control Program: Standard Operating Guidelines.

1. Community Engagement: LMPHW Lead: Public Information Officer

a. LMPHW will work with KDPH and other partners to prepare a communication campaign for pregnant women, travelers, healthcare providers, and the general public to raise awareness of Zika

virus. Public messaging will include information on the risk of sexual transmission and steps individuals can take to prevent it, as well as information on:

- General prevention
- Pregnancy and Zika
- Work with airport authorities to display Zika-related signage and/or run public service announcements regarding travel advisories for pre- and post- travel to Zika-affected areas
- Up-to-date information on Zika-affected areas (international and within United States)
- Mosquito bite prevention
- Mosquito control
- Pesticide use
- Other pertinent topics as they arise

b. The multimedia campaign will include the following:

- Multiple key messages and message maps
- Social media posts
- Public service announcements (audio and audiovisual)
- Door hangers
- Fliers and posters
- Letters to clinicians

c. LMPHW will recommend updates to scripts for the Metro United Way 211 and MetroCall 311 call centers to include Zika informational messaging and Frequently Asked Questions (FAQs) that are available on selected partner websites. Statewide and/or support local public information campaigns will encourage yard and personal property clean-up to reduce or eliminate mosquito habitats, to include draining, covering, or treating containers of water; use of mosquito repellant; use of air conditioning, if available; use of window and door screens, if possible; wearing long, light-colored clothing; and other tips for preventing mosquito bites.

d. The LMPHW Communications Planning Document is attached as Appendix 7.

2. Surveillance: Lead: Environmental Health Specialist/Mosquito Control**,** Supporting effort: Epidemiology

a. LMPHW will review the local mosquito control program as outlined in the LMPHW Environmental Division; Mosquito Control Program: Standard Operating Guidelines (Appendix 1) to assess the capacity and capabilities based upon 2014 and 2015 data (Appendices 2 and 3). Mosquito season in the Louisville Metro area typically lasts from approximately March 1st or when temperatures reach 45 degrees through approximately October 31st. The Mosquito Control Supervisor will evaluate

the need and procure, if needed, additional resources required to assist with trap placement and maintenance plus trained resources to enumerate and perform speciation procedures on the collected specimens.

b. Mosquito Control will plan and support local activities to prevent or mitigate transmission of Zika by mosquitoes, to include:

- Reducing *Aedes* mosquito habitats on or around personal or public property
- Reducing potential breeding sites on or around personal or public property
- Initiating community clean-up efforts

c. Concurrent with mosquito surveillance LMPHW will conduct general epidemiological surveillance for cases of Zika virus disease per the LMPHW EOP, Annex J, Epidemiological Response Plan. Action includes travel-associated cases, locally acquired cases, and cases of maternal-fetal transmission. Travel-associated cases include those travelers returning from affected areas, their sexual contacts, or infants infected in utero. Surveillance and testing algorithms will evolve as more information becomes available during mosquito season, with the goal of promptly identifying locally transmitted cases when possible.

3. Laboratory Testing: Lead: LMPHW Laboratory Technical Director

a. The LMPHW Laboratory branch has undertaken a project to acquire, install, and validate new equipment to enhance and increase the capacity and throughput to test locally collected mosquito specimens for the Zika virus. Equipment installation was completed on schedule as of May 16th with training sessions for laboratory staff beginning May 31st. At this time the target date for full mosquito testing capability remains July 1, 2016. This project represents a critical path event on the timeline for the Zika Response Action Plan in the Louisville Metro jurisdiction. The LMPHW Laboratory does not currently have the capability to test human samples for the Zika virus.

b. Healthcare providers with patients qualifying for Zika virus testing on human samples (blood and urine) can process the specimens through the following two laboratories:

i. Quest Diagnostics has been approved by the FDA to perform the PCR test on human blood specimens for patients with symptoms within 14 days of specimen collection. Samples are collected and sent to Quest Diagnostics by the provider. Results are returned directly to the provider in approximately one week.

ii. KDPH Division of Laboratory Services (DLS) has been approved to conduct Zika virus testing on human blood and urine specimens as follows:

(a). For patients who have been symptomatic within the last 14 days the provider can collect blood and urine samples for submission directly to DLS for PCR testing. Results are returned to both the provider and LMPHW Epidemiology in approximately one week.

(b). For patients with travel history to a Zika-affected area 2-12 weeks from the specimen collection date or for testing as a convalescent specimen the provider should contact (502) 564-3261 for approval to collect blood samples for submission directly to DLS for IgM testing. Results are returned to both the provider and LMPHW Epidemiology in approximately one week.

4. Vector Control: Lead: Environmental Health Specialist/Mosquito Control

a. LMPHW is the lead agency for mosquito surveillance and control in the Louisville Metro area. Louisville has had an established mosquito control program since 1957. The agency utilizes an integrated mosquito management approach to vector control, consisting of vector population surveillance, public education, larval mosquito habitat reduction, biological control, and chemical control of larval and adult mosquitoes. Larval source reduction (i.e. the physical elimination of larval breeding sites) involves the inspection and removal of man-made containers (including tires), clutter and trash around residences. For sites that cannot be removed or drained, appropriate larvicides are used to target developmental stages. Adult mosquitoes can be treated on a yard, block or residential level using a variety of equipment; backpack, hand-held sprayers, and trucks for neighborhood fogging. The LMPHW Environmental Division; Mosquito Control Program: Standard Operating Guidelines are used as a reference for these procedures (Appendix 1).

b. Mosquito Control resources will review mosquito surveillance data and update as necessary to assess whether historic maps of *Aedes aegypti* and *Aedes albopictus* distribution are accurate. Louisville Mosquito Density maps from 2014 and 2015 are included as Appendices 2 and 3.

5. Outreach to Pregnant Women: Lead: LMPHW PIO**,** supporting effort Community Health: Manager – Clinical Services

a. LMPHW will continue routine surveillance for suspected Zika virus infections, including pregnant women through OB/GYN clinics and other providers as appropriate. Resources will be identified that could be used to educate pregnant women regarding the prevention of Zika virus. This may include products to develop Zika prevention kits for pregnant women and resources for public education and outreach campaigns. Materials and information may include but not be limited to:

- Travel advisories
- Mosquito exposure/bite prevention tips
- Information about preventing sexual transmission of Zika
- Discussion regarding Zika Prevention Kits and acquisition/distribution options.

b. The distribution of educational resources, include but not limited, to the following:

- Postings on the LMPHW website
- Dear Clinician letters
- Clinical websites

- Locations in the community such as:

    - Daycares
    - OB/Gyn clinics
    - LMPHW WIC sites
    - Family Health Centers
    - Public libraries
    - Healthcare Provider offices
    - Worksites

c. Additionally efforts will be made to work with health care providers of pregnant women who are infected with Zika to enroll eligible women into the CDC US Zika Pregnancy Registry for future monitoring and follow-up of birth outcomes.

6. Blood Safety: Lead: LMPHW Office of Emergency and Public Health Preparedness

a. LMPHW will consult with American Red Cross and other local blood collection centers as appropriate on blood safety contingency plans. American Red Cross will continue to comply with FDA and American Association of Blood Banks (AABB) guidance regarding the screening of potential donors who may have travelled to an area that has active transmission of the Zika virus or who have had sexual intercourse with a male with recent travel history to a Zika area. The current ARC guidance document is in Appendix 4. LMPHW will monitor the CDC toolkit releases for information regarding the investigation of transfusion transmitted infection.

H. Phase I: Local Zika Positive Mosquito Confirmation: This phase of prevention, response, mitigation, and recovery efforts is initiated when a confirmation of a mosquito positive test for the Zika virus is reported by the LMPHW Laboratory. Biting activity of *Aedes albopictus* (Asian tiger mosquito) in the Louisville Metro area typically lasts from approximately March 1st or when temperatures reach 45 degrees through approximately October 31st. Monitoring of mosquito populations and testing of collected specimens will reach its peak during this timeframe. Efforts from Phase 0 will continue during this phase. Escalation to Phase II would occur immediately upon confirmation of a locally acquired human Zika infection.

1. Community Engagement:

a. LMPHW will continue a local communications campaign, with primary messaging focusing on awareness, personal protection against mosquitoes, and residential mosquito habitat and breeding site reduction. Public education and outreach efforts during this phase will include:

- Continuing dissemination of messages and products via social media and paid advertising on relevant websites
- Setting up news and social media monitoring via alerts

- Partnering with radio and television meteorologists to share messages related to mosquito-breeding weather conditions

b. LMPHW, in conjunction with KDPH will deploy messages encouraging travelers returning from areas with Zika transmission to take precautions to prevent mosquito bites for at least three weeks for asymptomatic travelers and one week for symptomatic travelers to reduce the risk of infecting local mosquitoes.

d. Messaging to healthcare providers to counsel their patients with Zika virus disease will continue by advising them to take precautions to avoid exposure to local mosquito populations by:

- Removing potential mosquito habitats and breeding sites from their personal property to include draining, covering, or treating containers of water
- Using mosquito repellant
- Using air conditioning, if available
- Using window and door screens, if possible
- Wearing long, light-colored clothing
- Providing counseling regarding the prevention of sexually transmitted Zika virus as appropriate.

2. Surveillance:

a. Upon notification of a local Zika positive test result for trapped mosquito specimens increased surveillance activities will be activated for the targeted area around the positive test collection site. Detailed specimen collection maps will be generated in an effort to focus the appropriate vector control actions on the larvae and/or adult mosquito population. If necessary to adequately cover the suspected area(s) where the mosquito Zika infection was detected additional resources may need to be acquired to place and recover traps, count and identify trapped specimens, and prepare updated threat maps of the Louisville Metro jurisdiction.

b. As additional Zika positive specimens are identified surveillance coverage of high mosquito density areas will be enhanced to maximize the ability to accurately define the scope and extent of the mosquito infected population and the predicted risk to vulnerable human population in that geographical area. Close communication with vector control personnel is paramount to minimizing the spread of the Zika infected mosquitos.

c. Concurrent with the effort by Vector Control to monitor and control mosquito populations in the Louisville Metro area once a Zika positive mosquito has been confirmed Epidemiology will take the lead in monitoring the populations in and around the targeted area. Healthcare providers in the targeted area(s) will be contacted to advise them of the precautions necessary to prevent Zika virus exposure and to collect data on all persons approved for testing to ensure any positive results are reported immediately.

3. Laboratory Testing:

a. The probability of a Zika carrying mosquito in the Louisville Metro jurisdiction prior to July 1 is quite low. In spite of this statistical probability all efforts should be focused on bringing the new laboratory equipment on-line and fully functional for mosquito pool testing by the July 1 target date. Should large populations of the target mosquito (*Ae. albopictus*) be observed, the capability to rapidly test a larger volume of specimens is critical to managing and mitigating the risk of a locally acquired transmission. Delays in equipment installation/validation or cross training laboratory staff represent a critical timeline event to the Zika Response Action Plan.

b. The Notification protocol for positive mosquito pool tests is outlined in the Organization and Assignment of Responsibilities section (Appendix 6). The confirmation of the first Zika positive mosquito is a key indicator to advance to the next level of response.

4. Vector Control:

a. Confirmation of a local mosquito specimen testing positive for the Zika virus immediately triggers an escalation in surveillance and abatement procedures. The LMPHW Mosquito Control resources will leverage partnerships with other Metro governmental departments, private sector, and non-profit organizations to disrupt mosquito breeding grounds through activities such as:

- Tire collections
- Waste removal in at-risk areas
- Other community clean-up efforts
- Collaborate with Surveillance teams in targeted areas for *Ae. albopictus* (Asian tiger mosquito) to determine abundance and distribution via a combination of pre-existing mosquito surveillance programs and the LMPHW Environmental Division; Mosquito Control Program: Standard Operating Guidelines
- Continue/maintain community source reduction efforts
- Initiate adult mosquito sampling in targeted communities to identify or confirm areas of elevated adult mosquito populations
- Initiate preventive adult mosquito control measures to reduce adult populations targeting areas of high mosquito abundance
- Concentrate control efforts around places with high mosquito density
- Use larvicide in containers/bodies of water that cannot be dumped

b. Shortfalls in equipment or manpower resources should be escalated quickly to avoid any delays in increasing the activity in the community. Target areas identified by collection and testing data will be posted to all in order to focus not only mitigation events but also increased community messaging activity to the public.

5. Outreach to Pregnant Women:

a. Efforts to push out messaging to pregnant women and women contemplating pregnancy must accelerate with intense focus on residents/providers in and around the target area identified by the positive Zika test in the mosquito population. Continued distribution of educational material will be targeted towards maternal-child healthcare providers. LMPHW should ensure all educational material is available in Louisville Metro facilities – especially all clinics and family health centers.

b. Heightened efforts will be made to work with health care providers of pregnant women who are infected with Zika to enroll them into the CDC US Zika Pregnancy Registry for future monitoring and follow-up of birth outcomes. Close attention will be paid to pregnant women who can be identified in and around (~150 yards) the target area(s).

c. During this phase, the Office of Emergency and Public Health Preparedness will purchase and distribute Zika Prevention Kits to pregnant women in the affected area and will determine cost and availability of expanding the distribution of Zika prevention kits to the Louisville metro area.

d. Zika Prevention Kits contain products to help prevent the spread of Zika. Items in the kit will help protect women who are pregnant or think they may be pregnant from being exposed to potentially infected Zika carrying mosquitos. Each kit will contain educational materials, condoms, insect repellent, and a starter kit of mosquito dunks to treat water in containers that cannot be emptied.

6. Blood Safety: Although notifications to Red Cross most likely will be provided by the CDC or other governmental agencies, LMPHW will reach out to the local American Red Cross Blood Services management team to inform them of the event. Efforts will also be made to contact other blood product processors in the community to inform them of the increased risk in the local area.

I. Phase II: Confirmed Local Transmission**:** Prevention, response, and mitigation efforts in this phase occur when one or more cases of locally-transmitted Zika virus disease in the Louisville Metro jurisdiction have been confirmed. Cases may occur in a single household or may be clustered in a neighborhood, community, or local jurisdiction. If multiple cases are confirmed outside a single household or address, the escalation to Phase III will occur immediately. Efforts from Phase 0 and Phase I will continue during this phase. LMPHW DOC activation may be established during this phase, if necessary per directive from the LMPHW Director. If the DOC is activated all Zika related prevention, response, mitigation, and recovery efforts will be managed through the appropriate branch of the ICS organizational structure (Appendix 5). At the discretion of Louisville Jefferson County Metro EMA, the local EOC may be activated. LMPHW will provide an ESF 8 liaison to the operation as needed.

1. Community Engagement:

a. Upon receipt of notification of a locally acquired human Zika infection case(s) LMPHW PIO in collaboration with KDPH will issue a press release to inform the public of confirmed local transmission of Zika. Press releases and talking points will be developed by the Public Information branch under the direction of the PIO and the Incident Commander. The LMPHW DOC in concert with the KDPH SHOC will work with Louisville Metro government to intensify public outreach and education efforts in and around the affected area to promote protection against mosquito bites. Methods of communication may include, but are not limited to:

- Fliers and posters
- News releases/media statements/tele-briefings, as appropriate
- Statements or addresses from community leaders
- Formalized news and social media monitoring to counter incorrect information
- Identify new or specific message needs (contraception education and planning)
- Make adjustments to communications plans as needed to target messages for pregnant women

b. Significant effort will be targeted to monitor local news stories and social media postings to determine accuracy of information, identify messaging gaps, and make adjustments to communications as needed.

2. Surveillance:

a. As human Zika positive cases are identified the Surveillance Team will, under the direction of the Information and Planning Chief, provide Vector Control with information regarding the physical location of the positive cases. Patient confidentiality issues may be a factor in determining if mosquito surveillance and control can be conducted around a patient's home. Due to HIPAA regulations and the concern for protecting patient anonymity, any targeted mosquito surveillance and control activities being conducted on or around a suspected patient's home should be implemented in a fashion that preserves the anonymity of the patient.

b. LMPHW Epidemiology should obtain patient authorization prior to sharing address (or other identifying) information to the Surveillance or Vector Control Teams. If it is determined a patient qualifies for targeted mosquito surveillance and control due to having a viremic period in the Louisville Metro jurisdiction LMPHW personnel should contact such a patient and advise the patient to avoid contact with mosquitoes (if still in their viremic period) and to take other personal protective measures. During this phone contact, the LMPHW representative should also request permission to share the address of the patient and/or patient contact information with local mosquito surveillance/control personnel.

c. The patient's address or other identifying information **should not** be shared without patient permission. It is recommended that any release of address or other identifying information to Surveillance or Vector Control Team should include the condition that the patient's information will not be disclosed to the public. If the patient does not authorize disclosure of his/her address, and targeted mosquito surveillance and control is deemed a necessary and priority action, these situations can be reviewed on a case-by-case basis with consultation with the LMPHW Director and appropriate Louisville Metro Government legal counsel.

d. During such discussions LMPHW should be prepared to discuss neighborhood characteristics, particularly in regard to the number and density of houses in the neighborhood, and the level of urgency for mosquito surveillance and control activities, as this information is important to inform this consultation. The area of implementation of aggressive control methods will be determined by the number and location of human cases, mosquito populations, container indices, presence of virus in mosquitoes, and the general risk of transmission.

3. Laboratory Testing: Accelerated, high volume mosquito sample testing may be required in order to keep prevention and mitigation efforts fully engaged in the appropriate neighborhoods/target areas when Zika cases have been identified. If human testing capabilities exist locally by the time of this event trigger there is the potential for engaging in discussions with Louisville Metro Government about an expanding need for increasing the number of laboratory staff resources assigned to Zika testing.

4. Vector Control: Intensified, targeted vector control activities will continue but must adhere to the same restrictions and guidelines as stated in the Phase II Surveillance section above. Efforts can continue jurisdiction wide to respond to mosquito complaints received by LMPHW. The Vector Control Team can target areas of known or recently identified heavy mosquito activity without specific permission from residents as long as no identification information is released about potential Zika positive human cases within the area. Additional activity may occur to identify and remove mosquito breeding conditions within the area in an effort to mitigate any further spread of the Zika virus.

5. Outreach to Pregnant Women:

a. The LMPHW DOC, if activated, in collaboration with the KDPH SHOC and the LJCEMA EOC, if activated, will support targeted communication and surveillance for pregnant women. Communications and outreach to healthcare providers will continue, with particular focus on maternal-child healthcare providers. LMPHW in collaboration with hospitals, OB/GYN practices, clinics, healthcare outreach efforts, and others providing healthcare in the community will continue to collect case information on cases of Zika virus disease in pregnant women, for inclusion in CDC's US Zika Pregnancy Registry. All efforts to push out messaging regarding mosquito bite prevention and sexual transmission of the Zika virus will continue as in the previous phases.

b. Based upon the analysis conducted in Phase I and the geographical area(s) where Zika has been confirmed, LMPHW may, based upon funding availability, provide a number of kits for

distribution to vulnerable populations in the Louisville Metro area. Instructions on key preventative measures will be distributed as part of the Community Engagement effort.

6. Blood Safety:

a. The American Red Cross and other local accredited blood product suppliers will comply with all FDA/CDC/AABB guidance regarding the collection of blood in an area of active transmission. Importation of blood to the areas with active transmission will be coordinated with the AABB, the FDA and CDC and the Commonwealth of Kentucky.

b. Blood centers located in other areas in the US will comply with the FDA/CDC/AABB guidance regarding the deferral of recent travelers to areas with active transmission. AABB Task Force contingency plans include:

- Public messaging
- Recalls of previously collected blood products (based on FDA/CDC/AABB guidance
- Suspension of blood collections in the affected jurisdictions(s)
- Importation of blood products from unaffected areas of Kentucky and the US, as necessary

c. Although CDC will be releasing alerts via their established protocols LMPHW will reach out to the local American Red Cross Blood Services management team to inform them of the event. Efforts will also be made to contact other blood product processors in the community to inform them of the increased risk in the local area.

J. Phase III: Widespread Local Transmission: Prevention, response, and mitigation efforts in this phase occur when one or more cases of locally-transmitted Zika virus disease have been confirmed in multiple localities within the Louisville Metro jurisdiction. There may be individual cases or case clusters in a single household, neighborhoods or communities. The LMPHW DOC will be activated with ICS procedures fully operational. If a Unified Command is established all operations will be coordinated through this structure. This phase may also be triggered by a rapid increase in the number of mosquito Zika positive test results from trapping activities. Efforts from Phases 0, I, and II will continue during this phase. In the event the number of identified positive cases increases at a rapid level this phase may be triggered and Phase II bypassed.

1. Community Engagement:

a. Public education and outreach efforts will intensify in and around the affected areas. Social media posts and tweets, targeted media monitoring and specific messaging for pregnant women will increase in frequency. The LMPHW DOC in collaboration with Louisville Metro Government,

LJCEMA, and KDPH will determine if a local call center should be stood up based on the number of calls being received by all agencies involved in the response.

b. Key messaging released in all previous phases will be reinforced to cover any travel advisories and stress the importance of understanding the potential for sexual transmission of the Zika virus and the prevention steps that should be followed. Outreach to OB/GYN and maternal-child providers will be the focus.

2. Surveillance:

a. Field surveillance activities to trap, identify, and speciate the mosquito population of the Louisville Metro area will continue on a widespread basis. Accelerated batching for submission for laboratory testing is critical. Additional resources including engaging partner agencies may be required to adequately cover the county and any adjoining geographical areas that may be contributing to the influx of Zika infected mosquitoes. Vector control will determine if additional entomological resources are needed to speciate the mosquito population and submit the requests through LJCMEMA to KDPH.

b. LMPHW Epidemiology resources in conjunction with support from KDPH will continue canvassing the healthcare providers, hospitals, clinics, and individual outreach to identify Zika positive individuals. Investigations continue to follow the appropriate HIPAA guidelines for collecting, collating, and sharing of patient information. Additionally the efforts need to monitor the Birth Registry for indications of significant rise in reported birth defects potentially attributed to the Zika virus.

3. Laboratory Testing: Accelerated, high volume mosquito sample testing will be required in order to keep prevention and mitigation efforts fully engaged in the appropriate neighborhoods/target areas when Zika cases have been identified. If human testing capabilities exist locally by the time of this event trigger there is the potential for engaging in discussions with Louisville Metro Government about an expanding need for increasing the number of laboratory staff resources assigned to Zika testing. Increased capacity and throughput for KDPH testing of human samples will also be critical.

4. Vector Control:

a. The LMPHW DOC Command will work with other Louisville Metro governmental departments, private sector mosquito control organizations, KDPH and other Kentucky state agencies to conduct larval and adult mosquito control. Recommendations for the scope of such control will be determined in consultation with Unified Command (if activated). Control plans should be tailored to meet the needs of the jurisdiction(s) and will be part of an integrated mosquito management approach.

b. Activities may include, but not be limited to the following:

- Mosquito control activities should be repeated as necessary to achieve adequate control
- Community clean-up activities will continue as outlined in previous phases

- Outbreak areas will be divided into operational areas where control measures can be effectively applied
- Door-to-door inspections and mosquito control in these operational areas will be considered, where resources permit
- Outdoor space spraying will be conducted in the following manner:
  - Least harmful to the environment;
  - Consistent with integrated mosquito management
  - Minimizes the risk of the buildup of immunity in local mosquito populations

c. For areas where air conditioning and screens are not widely available, the possibility of conducting a well-managed indoor residual spraying in at-risk homes may be an option. Interventions for high-risk populations, including pregnant women, include mosquito-proofing homes through installation of screens and air conditioning, if necessary. Unified Command, if activated, will support local areas and local public works in monitoring effectiveness of vector control efforts through mosquito trapping surveillance.

5. Outreach to Pregnant Women: The LMPHW DOC and Unified Command (if activated) JIC will work with local agencies and healthcare provides to:

- Provide up-to-date public health recommendations to pregnant women regarding travel to the affected areas within Kentucky and surrounding states
- Advise men in the affected jurisdictions to use condoms correctly and consistently or abstain from sexual contact with pregnant women and other men
- Implement intervention plans for at-risk pregnant women in affected areas such as:

  - Mosquito-proofing homes
  - Providing additional materials such as insect repellent, larvicide, and educational materials
  - Revise procedures for the testing of asymptomatic pregnant women in affected localities or pockets of high incidence of Zika positive mosquito populations
  - Conduct retrospective enhanced surveillance in healthcare facilities to establish the earliest known date of local human infection to guide decisions on counseling/testing of asymptomatic pregnant women.

6. Blood Safety:

a. The American Red Cross and other local accredited blood product suppliers will comply with all FDA/CDC/AABB guidance regarding the collection of blood in an area of active transmission. Importation of blood to the areas with active transmission will be coordinated with the AABB, the FDA and CDC and the Commonwealth of Kentucky.

b. Blood centers located in other areas in the US will comply with the FDA/CDC/AABB guidance regarding the deferral of recent travelers to areas with active transmission. AABB Task Force contingency plans include:

- Public messaging
- Recalls of previously collected blood products (based on FDA/CDC/AABB guidance
- Suspension of blood collections in the affected jurisdictions(s)
- Importation of blood products from unaffected areas of Kentucky and the US, as necessary

c. Although CDC will be releasing alerts via their protocols LMPHW will reach out to the local American Red Cross Blood Services management team to inform them of the event. Efforts will also be made to contact other blood product processors in the community to inform them of the increased risk in the local area.

J. Phase IV: Widespread Regional Transmission: Prevention, response, and mitigation efforts in this phase occur when multiple cases of locally-transmitted Zika virus disease have been confirmed in multiple localities not only within the Louisville Metro jurisdiction but surrounding counties and a large portion of Kentucky. These may be individual cases or case clusters in a single household, neighborhoods or communities. Efforts from Phases 0 through III will continue during this phase. At this level of response the operation will most likely shift to a Unified Command with the LMPHW DOC, LJCEMA, KDPH SHOC, and the KyEM EOC fully activated. Major response events may be under the direction of a Federal and/or State level of declaration.

1. Community Engagement: Same as Phase III but coordinated state-wide with Federal/State resources.

2. Surveillance: Same as Phase III but coordinated state-wide with Federal/State resources.

3. Laboratory Testing: Same as Phase III but coordinated state-wide with Federal/State resources. LMPHW laboratory in conjunction with the KDPH lab and CDC may be supporting testing for specimens throughout the region and surrounding geographical areas.

4. Vector Control: Same as Phase III but coordinated state-wide with Federal/State resources.

5. Outreach to Pregnant Women: Same as Phase III but coordinated state-wide with Federal/State resources.

6. Blood Safety: Same as Phase III but coordinated state-wide with Federal/State resources.

IV. Direction and Control: See LMPHW EOP, Annex A for guidance emergency operations response and operations.

V. Administration, Finance, and Logistics: See LMPHW EOP for guidance on Mutual aid requests, financial tracking and logistics.

A. Administration: Mutual aid and assistance requests will be sent through the LCJEMA EOP to the KDPH SHOC.

B. Finance:

1. Current budget available is $3400 identified from remaining Ebola (cost center 737).

2. Additional funding will be requested through LMPHW fiscal and executive administration.

VI. Authorities and References:

A. CDC (Zika Virus): http://www.cdc.gov/zika/

B. Kentucky Health Alerts (Zika Virus): http://healthalerts.ky.gov/Pages/Zika.aspx

C. Louisville metro: https://louisvilleky.gov/government/health-wellness/zika

Appendices:

Appendix 1 – LMPHW Environmental Division; Mosquito Control Program; Standard Operating Guidelines
Appendix 2 – Mosquito Surveillance Data Map/2014
Appendix 3 – Mosquito Surveillance Data Map/2015
Appendix 4 – American Red Cross Blood Supply Guidance Document
Appendix 5 – LMPHW ICS 207 (Incident Organization Chart) for Zika Response
Appendix 6 – LMPHW Laboratory Notification Protocol and Flowchart
Appendix 7 – LMPHW Communications Planning Document

Appendix 1

Environmental Division: Mosquito Control Program

Standard Operating Guidelines

PUBLIC HEALTH AND WELLNESS
DIVISION OF ENVIRONMENTAL HEALTH & PROTECTION
LOUISVILLE, KENTUCKY

GREG FISCHER
MAYOR

LAQUANDRA NESBITT, MD, MPH

Environmental Division: Mosquito Control Program

Standard Operating Guidelines

Louisville Metro Department of Public Health and Wellness-Environmental Health Division
March 9, 2009
Reviewed: May 22, 2012

www.louisvilleky.gov

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Request for Service (Complaint Investigations)

Initial investigation

1) Staff members and MetroCall will enter all complaints into the Hansen/MIDAS system and employees will review accounts assigned to them daily (see Attachment 1). Environmentalists will, for the most part, be responsible for selecting and scheduling their own inspections on a given day. The Mosquito Control program will investigate those complaints pertaining biting mosquitoes and potential mosquito breeding sites. Health Department staff will access MIDAS and look up S/R assigned to them daily to route activity for the day. Environmentalists should attempt to inspect those complaints that have not been inspected with the oldest initiation date first. It is expected that environmentalists will route themselves properly to conserve on the amount of mileage they will travel during a work day.

2) When the problem or problem site is not specifically identified; the complainant should be contacted to obtain additional information. The complainant should be questioned regarding the location of any standing water issue or potential mosquito breeding areas. Information regarding the mosquito problem (e.g., time biting occurs, description of mosquito) should also be obtained.

3) When a visit to the complaint site is made, the site should be surveyed for mosquito breeding or potential mosquito breeding. This would also be an appropriate time to sample standing water for larvae samples. Although the initial site review should be primarily concerned about mosquito breeding or potential mosquito breeding areas, it should not ignore other apparent or potential health hazards. If the presence of adult mosquitoes is confirmed, the site should be further evaluated for later "adulticiding." Additionally, the person or persons responsible for the maintenance of the property should be identified.

4) If the potential mosquito breeding problem is on private property, the problem of concern should be discussed with the responsible party, and educational materials should be provided where appropriate. Methods to abate the problem(s) should be reviewed. An order for corrections should be issued to the responsible party. The order should require correction of the conditions within a reasonable time frame.

5) After each inspection, the Mosquito Control staff will update the S/R by adding log comments into MIDAS. It is important that these updates be properly coded (e.g., initial inspection, order, update, etc.). Moreover, the initial inspection should always be coded as the initial inspection even if it is resolved afterwards. "**All" complaints should be inspected within 10 days from receipt of the initial complaint**. Any log entry will also include the time/date of the inspection, the inspecting environmentalist, and any other applicable information. After each subsequent inspection (follow-up) "new" comments are logged into the MIDAS. The S/R will remain open in the database until the S/R has been resolved.

Follow-up Inspections-

If a complaint cannot be resolved after the initial phone call or inspection; it will likely require follow up inspection(s). Areas that are treated with pesticide should be revisited at some duration as outlined by the pesticide labels to ensure proper treatment for mosquitoes. For

example, if the pesticide offers 30-day protection against mosquito larvae, the reinspection should be done at 30-day intervals (i.e., one month). All other accounts should be followed-up according to priority level and the duration between previous visits.

When orders have been issued, a paper file must be generated to track it outside of the HANSEN/MIDAS system (see Special Cases). These cases should be given a higher priority from the inspector. The follow-up inspections should be done soon after the orders compliance date. If the problem is corrected, the responsible party should be contacted and thanked for their cooperation. Additionally, the paper file should be filed away and the MIDAS file should be updated and resolved.

However, if the problem is not corrected, the responsible party should be contacted and allowed to demonstrate that a good reason for the non-compliance continuing.

- If a good reason did exist, then an extension of the compliance deadline should be granted.

- If a good reason did not exist, then the responsible party should be scheduled for an administrative conference where they can attempt to show just cause for failure to comply with our order for correction.

If the responsible party fails to appear for the administrative conference or does appear but fail to demonstrate just cause to the hearing officer, then the case should be prepared for court action.

Special Cases
Most complaints should be resolved by the end of the season; however, when orders have been issued, office hearings scheduled, or cases have been signed up for court, a case may be unresolved from one season to the next. Although these complaints will be entered into HANSEN/MIDAS, a paper file must be created to retain copies of orders, office hearings, and any other document generated outside the HANSEN/MIDAS system. A salmon colored cover sheet should be used to record the complaint address, SR number, pull date, and assigned environmentalist. Additionally, cases that have been signed up for court will have a separate court jacket with a pull date as well.

Mosquito Pretreatment

1. The program staff members maintain a listing of those areas and sites, in the Metro Area, that have been found to breed significant numbers of mosquitoes during previous years. The existence of these sites has the potential, in any given year, to greatly impact the human populations in close proximity. These sites are updated as necessary (usually yearly or biyearly) if the listed conditions are found to have changed.

2. Sites are monitored by the staff members for the development of standing water or other conditions (tire dumps, tire ruts, etc) that are favorable to the breeding of mosquitoes.

3. If conditions in pretreatment sites become favorable for mosquito breeding, the environmentalist assigned this area will take appropriate actions to mitigate mosquito breeding. The presence of mosquito larvae in the water does not always warrant treatment of the water with pesticide since the pretreatment has been shown to sustain some larval forms of mosquitoes. Generally, pretreatment activities are at their peak in the spring when early season rains inundate areas with water; however, this is not the case in all sites.

4. Division staff will treat the area or site with mosquito control products when necessary to provide the needed community protection. Pretreatment activities may employ chemical treatment of the larval breeding habitat or use a combination of larvacides and adulticides to mitigate mosquito populations.

Population and Disease Surveillance

Staff members conduct mosquito surveillance activities in order to monitor for the presence of mosquitoes in the community. This system is designed to monitor overall mosquito population size while actively testing for disease presence in those mosquito populations.

1. Environmentalists collect both adult and larval mosquito samples, as part of their mosquito pretreatment, Complaint Investigation and surveillance activities.

2. Larval samples should be collected from various locations (e.g., swimming pools, tires, puddles) when encountered on any given inspection, pretreatment, or surveillance. Each location type should be considered a separate sample because the information can be used to assess which habitats a mosquito species inhabits.

   Larval samples should include the following information on the sample vial 1) address/location, 2) collector, 3) date of collection, 4) habitat where sample was taken (e.g. tire, gutter, or stream). An accompanying sample sheet will be filled out in duplicate for each sample. This sheet will be used as a reporting sheet after the sample is submitted.

3. The samples collected (adult and larva) are forwarded to an entomological consultant at the University of Kentucky, for species identification. Species identification allows the program staff to better target their prevention and treatment activities to the appropriate habitat type. An annual report is generated by the department's consultant, which allows the program staff to monitor for trends.

4. Landing counts (environmentalists use themselves as 'bait' for mosquitoes) may be used to provide a reference for the species and abundance of biting mosquitoes in an area. These are evaluated as the number of mosquitoes that physically land in a given time period (usually expressed as landings per minute). Landing counts can be used as criteria for adulticiding (see below Adulticiding).

Captured mosquitoes from landing counts can also be submitted for identification to the entomological consultant. These samples should be treated the same as larval samples when being labeled and the same reporting sheet included.

5. Regular Mosquito "Light Traps", which use ultraviolet light and carbon dioxide as bait, are placed at multiple locations throughout the community and samples are collected for 24-hr period. Light Trap locations are sampled a minimum of every two weeks. An additional attractant called octonal may also be used to augment carbon dioxide bait or may be used as a 'stand alone' attractant.

6. Additional Mosquito "Light Traps" are placed by environmentalists and summer workers to evaluate mosquito populations in various other places throughout the Metro area. This is done at the discretion of the environmentalist where they see a need for additional surveillance activities in the area.

7. All light trap samples should be frozen for a minimum of 25 minutes in the LMPHW lab or mosquito control freezer. After freezing, samples will be sorted (removing non-mosquito insects) and a total count of all mosquitoes will be entered into the 'Mosquito Light and Gravid Trap Log Sheet.' From the total number of mosquitoes collected, specimens selected for identification by the entomological consultant will be of good condition (have head, thorax and abdomen, have both wings, have at least 4 legs, and still have attached scales.

8. Portions (split samples) of "Light Trap" samples are sometimes submitted for mosquito borne disease testing.

As part of a statewide system, testing for the presence of diseases spread by mosquitoes, staff collect samples of mosquitoes using traps designed to capture mosquitoes most likely to have fed and contain blood.

1. Mosquito "Gravid Traps", which mimic the egg laying sites favored by the disease caring species of mosquitoes, are placed at eight locations throughout the community and samples are collected for one (24 hour) day each week.

2. Mosquito samples are to be placed in the freezers at the LMPHW lab or in the Mosquito Control Division. After a minimum of 25 minutes, samples are sorted (remove non-mosquito insects from sample). Sorted samples will also have the male mosquito segregated out. ONLY FEMALE mosquitoes should be submitted for arbovirus testing. The total number of mosquitoes (both male and female) will be reported on the 'Mosquito Light and Gravid Trap Log Sheet.'

3. An accompanying form is to be filled out for each sample being submitted. When trained staff is available, mosquito samples should be speciated before submission for diagnostic testing. This form should be filled out completely. A matching unique identifying number is placed on each sample vial and the accompanying sample sheet.

a. A given sample should not have more than "35" mosquitoes. Samples will also be based on separate species collected from a single location at a specific time. For example, if Site A has 5 species of mosquitoes present one day, five samples will be submitted for Site A (one for each species). However, if Site B produced 50 mosquitoes of the same species another day; two samples would be submitted (one sample with 35 mosquitoes and another with 15 mosquitoes). Similarly, if fewer than 35 mosquitoes of the same species were collected at Site C on the same day, only one sample would be submitted.

b. When trained staff are not available to speciate mosquitoes and mixed location samples are sent for diagnostic testing, submitted mosquitoes should be in good condition (i.e., have head, thorax, and abdomen; have both wings; have at least 4 legs; and have attached scales). All accompanying paperwork, as well as the sample vial, should indicate that the sample has not been speciated.

4. Mosquitoes collected are to remain in refrigeration before being forwarded, overnight, to the state laboratory for testing or identified by trained Mosquito Control staff and sent to the Department of Public Health and Wellness's Lab or the Kentucky Department of Agriculture Livestock Diagnostic Center for testing. Samples should be shipped in insulated containers (such as Styrofoam) with an ice pack inside to keep the sample cool during transport. Additionally, mosquito sample submission forms should be placed in the shipping container prior to shipping. Mosquito samples to be tested for disease presence should be processed and shipped out within the same week they were collected if possible. Samples should not be mailed out on Friday since samples will arrive at the state laboratory and remain unrefrigerated for several days.

5. Samples being sent off site for diagnostic testing should be weighed, and the proper UPS/US Postal Service forms filled out along with postal information placed on the box.

6. Samples collected will be sent to either the local or state lab to test for the indicators of the mosquito borne diseases.

7. Any indications of mosquito born disease noted by the laboratory are reported to the Department of Public Health and Wellness.

8. ALL OUTGOING SAMPLES will have an entry in the sample submission log. This log helps program staff to know how many samples have been sent out and which samples have not been reported on. It also verifies when a sample is lost by the entomological consultant or the diagnostic laboratory. This is part of quality control and assurance.

Adulticiding ("Fogging")

Staff members will conduct mosquito adulticiding (the fogging of an area with a pesticide in order to kill adult mosquitoes) when necessary to reduce the potential for mosquito borne diseases or, when indicated by surveillance criteria.

1. Any area being considered for adulticiding ("Fogging") will be evaluated prior to adulticiding and a decision will be based on some or all of the following criteria:
    - Light Trap surveillance captures 100 or more mosquitoes during 24-hr period.
    - Gravid Trap surveillance captures 50 or more mosquitoes in a 24-hour period.
    - Staff Environmentalist has observed a mosquito landing count of more than 5 mosquitoes per minute.
    - In response to a mosquito borne disease outbreak.
    - Mosquito Borne Disease presence in an area (human, mosquito or veterinary samples, not bird sample).

2. When adulticiding criteria has been met, the environmentalist assigned the case that prompted the mosquito surveillance will complete the following steps to initiate adulticiding:
    - Create or mark a map to delineate the area to be fogged.
    - Ascertain the Northerly, Easterly, Southerly and Westerly boundaries of the area to be fogged
    - Fill out the 'criteria form' and the 'pre-fogging route form'
    - Notify supervisor of the intent to fog
    - When possible, find program staff to assist in fogging (fogging should be done in 2 person teams unless otherwise specified.
    - When possible, advance schedule adulticiding operations
    - Check weather report for conditions conducive to fogging.
        1. above 55º F and below 85º F
        2. wind speeds less than 10mph
        3. no precipitation

3. The supervisor or his/her designee will notify specified Metro agencies or individuals who will assist in fogging operations.
    - EMA- LENS Operator
    - Metro Call Supervisor
    - LMPHW Deputy Director over Environmental
    - LMPHW Director
    - LMPHW Media Relations
    - Environmental Clerical Supervisor
    - LMPHW Information Technology Webmaster
    - Jefferson County Public Schools Environmental Representative

4. Residents living in an area that has been scheduled to be fogged will be notified in advance by phone that fogging has been scheduled. 'LENS' (Louisville Emergency Notification System) is the service currently used to notify resident that fogging has been scheduled in their area. Sign postings will be also be used when the fogging

route covers very large urban areas. Additional notification will be used on a case by case basis.

LENS notifies residents by calling all listed phones in a selected area and providing them with a pre-recorded fogging information message. Any scheduled fogging should not commence until 24 hours after the LENS calling has initiated, unless disease outbreak conditions occur and immediate fogging operations are necessary as deemed by the management.

Any fogging must be completed within 10 days of the initial notification or the LENS notification. If for some reason the fogging cannot be completed within that time period, the LENS notification should be reinitiated to call homes in that area.

5. All pesticide applications will be done in compliance with pesticide label requirements. Any and all application of pesticide will be done in a manner consistent with all local, state, and Federal regulations and good Public Health Practices.

   Environmentalist will wear the appropriate personal protective equipment when filling the fogger.
   - Gloves
   - Apron
   - Glasses or goggles

   Environmentalist will make every effort to ensure that no individual is directly sprayed by the fogging vehicle. When people are observed within the fogging path, the pesticide spray will be shut off until the truck has passed these individuals or until that individual has time to seek cover. When individuals refuse to stay out of the spray; either walking, running, and riding a bike or when too many individuals are present on the street, the environmentalist should cease fogging operations and return to that site at a later time or date if deemed necessary.

6. Staff Environmentalist will complete a fogging report which accurately portrays a fogging event. The report must contain information about the area(s) treated, pesticide used, amount of pesticide used, map of the area treated, date of application and total area treated, and criteria for fogging. These reports are required by the state and will be maintained in a fogging binder.

   a) Treatment reports should be filled out at the time of fogging operations and will include start and end time and mileage for when the fogger is in operation in a given area. If the fogger is off for more than 2 minutes, a new entry should be made.
   b) Each fogging entry should be labeled with a general description of the site being fogged.
   c) Mileage can be determined by start and stop miles on the tachometer or using the trip tachometer

d) When additional technology becomes available that calculates pesticide usage and area treated with adulticide, the above procedures will continue to be used for quality control purposes.
e) Smartflow© equipped fogging vehicles should adhere to the following procedures to ensure accuracy
    1) Turn the power on (top right) and turn flow switch to off position (bottom right)
    2) Turn the indicator knob to the 'total flow' indicator
    3) Press the Reset button and hold in until the display for total flow shows zero
    4) Turn indicator knob to 'total area," "Field area" and "field flow" to verify that all values have been reset to zero
    5) When the area to be fogged has been reached
        i. Select the flow rate to be used for the appropriate pesticide and application (1, 2 or 3)
        ii. Flip start and choke toggle switches up at the same time to start the fogger and allow the fogger to warm up.
        iii. Turn indicator dial to the flow per minute (this is to monitor whether the fogger can keep up with current pace of driving and still achieve the proper pesticide flow rate)
        iv. Turn pesticide flow switch to 'Var' and begin fogging. If the pesticide must be shut off, it should be done with the pesticide flow toggle switch, not the Power toggle switch.
        v. After fogging is completed turn indicator knob to setting 'total flow' and record the number, then turn the knob to 'total area' and record the number.

No Fog List

A list will be maintained each season which includes those individuals who have requested that fogging operations not be conducted on their property. This is done as a service to the public.

1. The list will include the following information
    a. Name of requestor
    b. Date requested
    c. Property address
    d. Phone number
    e. Area of town/Neighborhood
    f. Email address

2. Citizens who want their home included on the No Fog List must formally make their request in writing and may only request their primary residence be placed on this list.

3. The no-fog list is in effect only for a single mosquito season. The purpose of this is that people may relocate and sell their home and new owners may not want to be part of a no-fog list.

4. Environmental staff will make every effort to adhere to the no-fog list as closely as possible when adulticiding operations are for the purpose of nuisance mosquito reduction. In the event that the presence of an arbovirus is detected in an area of Metro Louisville and the requestor's address is in the designated area to be fogged for arbovirus vector abatement, the no-fog list will be considered null and void.

5. Being a no-fog property only entitles the property owner to have the fogging pesticide flow ceased in front of their home. While fogging along the street, the pesticide flow will be discontinued at the leading corner of a no fog property, but resumed after passing the ending edge of the property. It does not give any specific assurances that pesticide will not drift from other adjacent properties onto the no-fog property.

Drainage Bond Reviews

1. Public Works Department or this division will receive a notice from the developer of the developer's desire to have the bond released on a given subdivision section.

2. Upon receipt of a bond release request, mosquito control staff will contact the developer by phone or letter advising them that a written request must be sent to the Department of Public Health and Wellness along with a copy of the composite drainage map. Once this has been received and all pre-inspection criteria have been met, an inspection will be conducted.

3. After receipt of the required information a subdivision bond file will be created. This file will contain all written correspondence with the developer/designee, subdivision maps, and inspection information from the Department of Public Health and Wellness.

4. After receipt of the required information or after the file is created, division staff will schedule a subdivision inspection as soon as is reasonably possible (these inspections, though important, take lower priority to disease prevention activities).

5. During the inspection, staff will walk the drainage system involved and all areas of potential mosquito breeding will be noted.

6. A letter, reporting the findings of the inspection, will be generated and forwarded to the Public Works Department, other agencies presiding over the bond and to the

developer. The letter will include a list of the corrections required or will make the statement that proper drainage was found during the inspection.

7. In those cases where corrections were noted as needed, a follow up contact will be made (either by letter or by phone call) with the developer to encourage that corrective actions are taken.

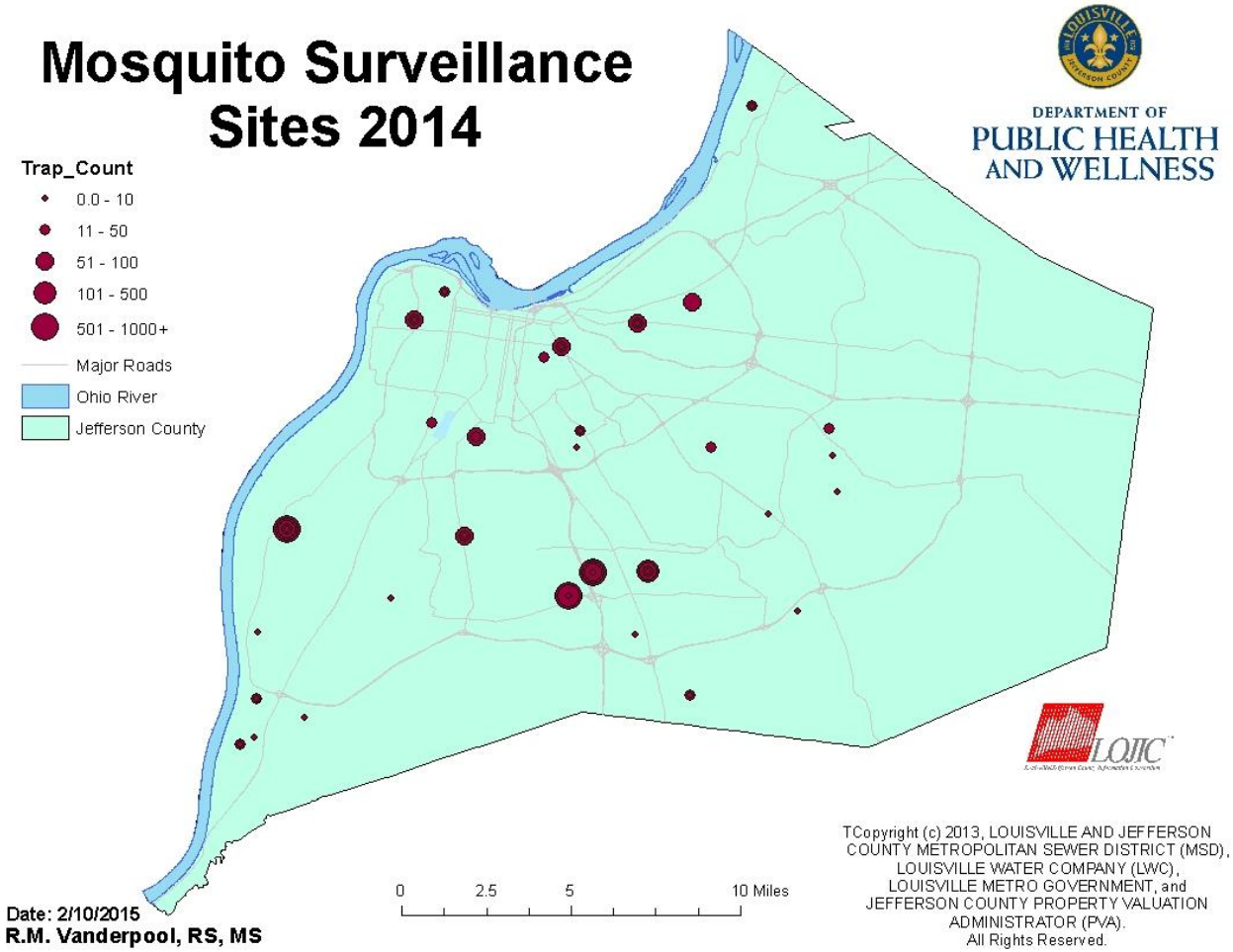
8. When advised by developer that conditions have been corrected, staff will re-inspect subdivision and review the potential mosquito breeding problems noted during previous inspection. This system of inspection and contact with the developer will continue until positive drainage is found throughout the area under development or the bond is forfeited to Public Works or MSD.

9. In cases where drainage bonds are not corrected in a reasonable amount of time (as determined by Public Works SOP), Mosquito Control staff can recommend bonds for 'bond forfeiture' proceedings. These issues are to be discussed in the Subdivision Bond Meetings conducted monthly between the agencies presiding over the inspections of the Subdivision Bonds. When all parties except the Department of Public Health and Wellness have released their interest in the bond(s), the property should be inspected again by the Supervisor, Manager, and/or an additional inspector prior to proceeding with "any" type of forfeiture. These added inspections should be done to ensure that bond forfeiture is warranted rather than some other action.

10. Upon the determination that positive drainage has been achieved, a letter will be forwarded to The Public Works Department indicating that the division approves the release of the bond to the developer.

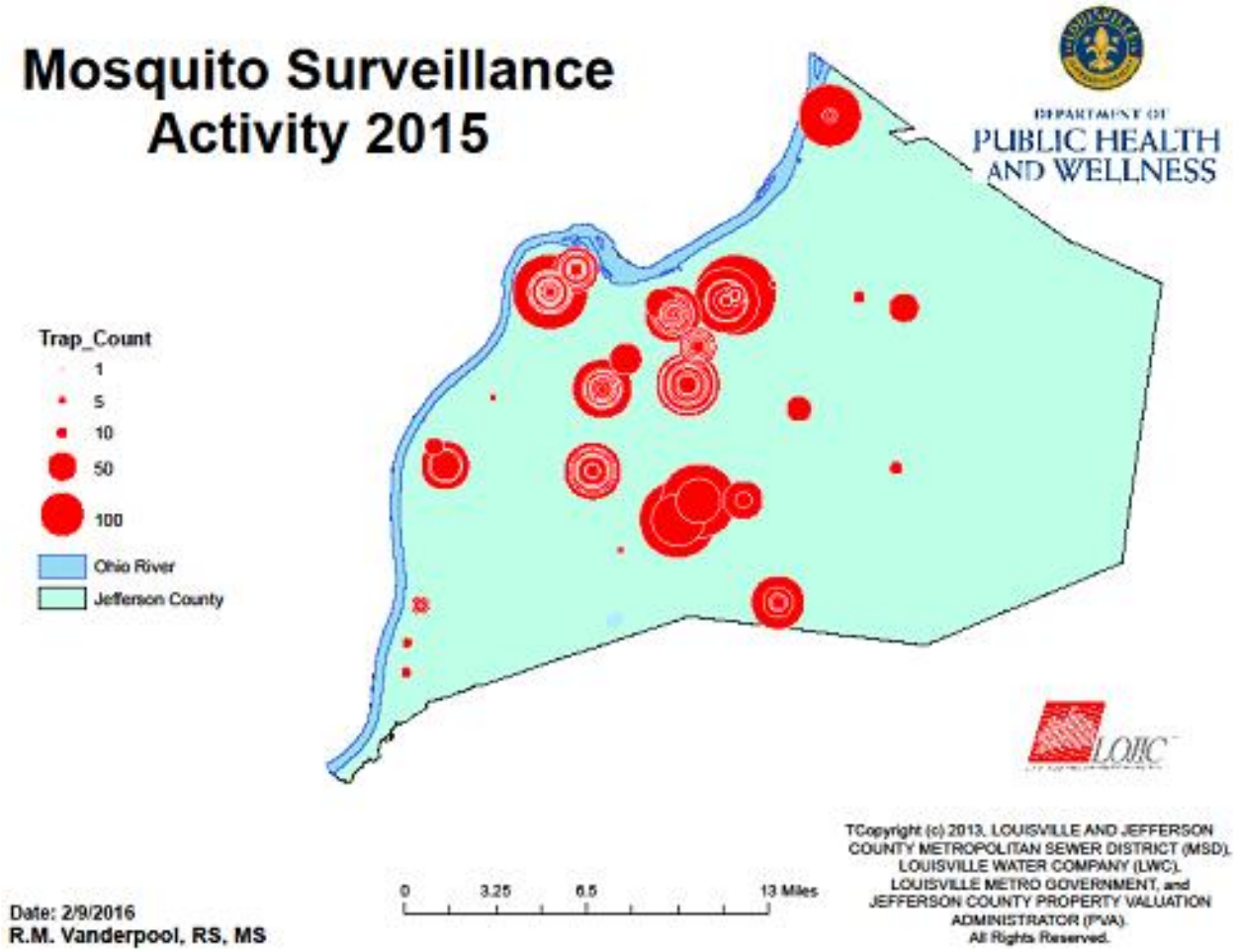
APPENDIX 2

LOUISVILLE MOSQUITO DENSITY (2014)



APPENDIX 3

LOUISVILLE MOSQUITO DENSITY (2015)



Appendix 4

Red Cross Statement on Zika Virus

Posted Mar 14,2016

The following statement regarding Zika virus may be attributed to Dr. Susan Stramer, vice president of Scientific Affairs at the American Red Cross:

"The American Red Cross is dedicated to providing the safest, most reliable blood products possible to patients in need.

We are closely monitoring the spread of Zika virus. On March 14, the Red Cross implemented the U.S. Food and Drug Administration's (FDA) guidance to reduce the risk of transfusion-transmission of Zika virus. Following the guidance, we have added a specific question to our donor health history questionnaire concerning travel to or residence in areas with local Zika virus transmission and we continue to ask donors to self-defer, or postpone their blood donation for four weeks, if they are at risk of Zika virus exposure.

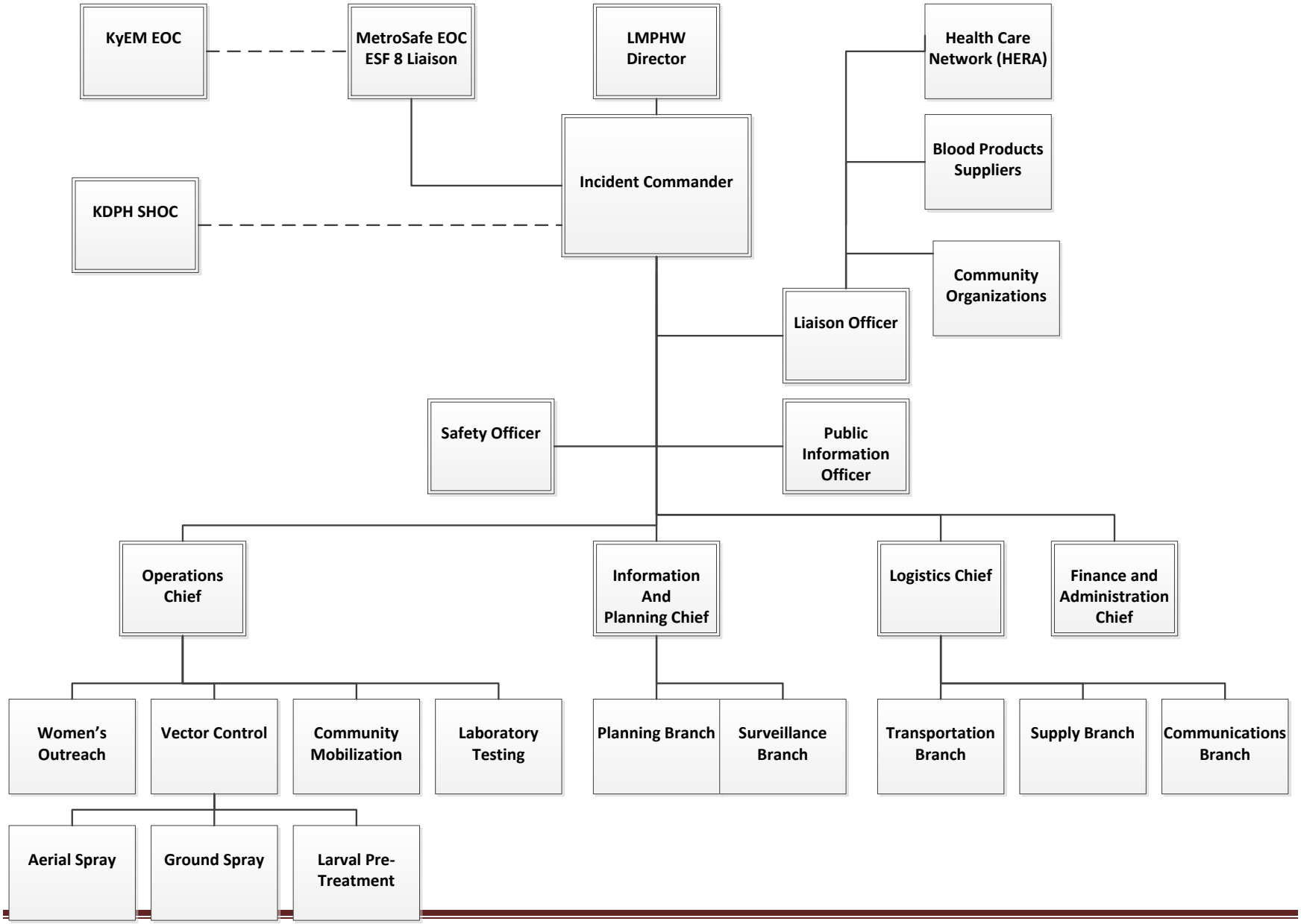
Those risk factors include: travel to or residence in countries on the Centers for Disease Control and Prevention (CDC) Zika Travel Information list within the last four weeks; diagnosis of Zika virus infection; existence of two or more Zika virus infection symptoms within two weeks of leaving an area with local transmission; or sexual contact within the last four weeks with a man who in the three months before sexual contact was diagnosed with Zika virus infection, or traveled to or resided in an area with local Zika virus transmission. Potential donors with any of these risk factors should schedule their blood donation for four weeks after the end of the defined risk periods noted above.

The Red Cross continues to use additional safety measures to protect the blood supply from Zika virus and other mosquito-borne viruses. As part of our current health screening process, we only collect blood from donors who are healthy and feeling well at the time of donation.

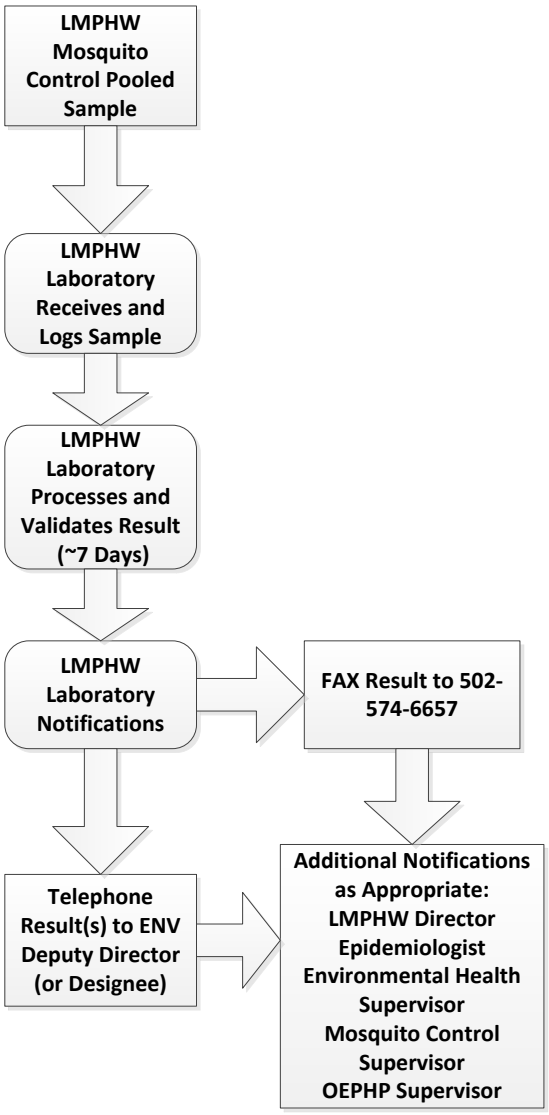
The Red Cross also provides a call back number if the donor develops any symptoms of disease within the next several days following donation. Specifically with Zika virus, we ask that if a donor does donate and subsequently develops symptoms consistent with Zika virus infection within two weeks of that donation, that he or she immediately notify the Red Cross so that we can quarantine the product. Donations from donors who develop any symptoms of disease are not used for transfusion.

The risk of contracting Zika virus by blood transfusion in the continental U.S. at this time is believed to be extremely low due to the absence of local mosquito transmission. The Red Cross continues to evaluate all emerging threats in collaboration with the FDA and CDC to determine what additional mitigation strategies are needed as the situation evolves."

APPENDIX 5 – INCIDENT COMMAND STRUCTURE for ZIKA RESPONSE



APPENDIX 6 – LABORATORY TESTING NOTIFICATION FLOW CHART (Mosquito Samples ONLY)



APPENDIX 7 – COMMUNICATIONS PLANNING – ZIKA VIRUS

Communications Planning – Zika Virus

Background/Purpose:

- Inform and educate pregnant women, women wanting to get pregnant, and women of childbearing age, the health risks of the Zika virus
- Provide the local medical community with up-to date information from the CDC and other recognized sources
- Communicate the relative health risks of Zika virus to the general public
- Inform and educate residents of Louisville and Jefferson County about what they can do to protect themselves and their families and neighbors from mosquitoes and the diseases they may carry
- Communicate information and education about LMPHW's mosquito control program and activities

Key Audiences:

- Pregnant women, women wanting to get pregnant and women of childbearing age
- Physicians and the medical community
- General public

Key Messages:

<u>For Pregnant Women</u>

- The Zika virus can cause certain birth defects.
- Protect your pregnancy
    - Don't travel to South and Central America, Puerto Rico the Caribbean and other parts of the world with on-going Zika infection.
    - Protect yourself from mosquito bites
        - Daytime is most dangerous. Mosquitoes are aggressive daytime biters.
        - Wear repellant
        - Cover your skin

        - Mosquito-proof your home
    - Avoid having sex or use a condom with male partners who have travelled to an area with Zika.
- If you are pregnant and develop a fever, rash, joint pain, or red eyes within 2 weeks after traveling to a place where Zika has been reported, see your doctor or other healthcare provider. Be sure to tell your doctor or other healthcare provider where you traveled.

For General Public

- Mosquitoes can carry diseases like the West Nile and Zika viruses.
    - Fight the Bite! Protect yourself from mosquito bites:
        - Daytime is most dangerous. Mosquitoes are aggressive daytime biters.
        - Wear repellant. Look for these active ingredients: Deet, Picaridin, IR3535, oil of lemon eucalyptus
        - Cover your skin. Wear light colored long-sleeved shirts and long pants.
        - Mosquito-proof your home:
            - Get rid of sources of standing water (clean gutters, clean bird baths weekly)
            - Keep mosquitoes out of your home by using screens on windows and doors
                - Repair holes in screens
            - Use air conditioning if its available
            - If you have a septic tank:
                - repair cracks or gaps
                - Cover open vent or plumbing pipes with wire mesh with holes smaller than an adult mosquito.
- Louisville has had a mosquito control program since 1957 and will be increasing mosquito control this year in light of Zika.
- LMPHW works to control the mosquito population by:
    - Capturing mosquitoes and testing for viruses
    - Fogging
    - Deploying larvacide/insecticide in water sources
    - Educating and informing residents what they can do to prevent and control mosquitoes
        - Learn about fogging routes and receive fogging alerts for your neighborhood by going to www.louisvilleky.gov/health-wellness/bugs

Other General Talking Points

- Most people infected with Zika virus won't even know they have the disease because they won't have symptoms.
- The most common symptoms of Zika virus include fever, rash, joint pain, or conjunctivitis.

- Currently no vaccine exists to prevent Zika or (West Nile, dengue, or chikungunya viruses spread by mosquitoes)
- To date, there have been no reports of Zika being spread by mosquitoes in the continental United States.
- The primary mosquito species that spreads Zika - *Aedes aegypti* - is present in the coastal regions of Alabama, Texas, Louisiana, Mississippi, and Florida. These species are not commonly found in Louisville.
- However, *Aedes albopictus,* the Asian tiger mosquito is also thought to be able to transmit Zika and is common in the Louisville area.

Timeline/Tactics/Strategies:

Tactic/Strategy	Responsibility	Due Date
Syndicate the Public Health and Wellness website with the CDC Zika pages	Caitlin Herron	Completed. *Updated regularly whenever CDC adds updates.*
Publish "Guidance for Physicians" with the Greater Louisville Medical Society."	Dr. Joann Schulte, Dr. Sarah Moyer, Dr Katie Pohlgeers, Dave Langdon	Completed. This will continue to be updated as needed
Place an article in Louisville Medicine Magazine bylined by Dr. Moyer and Dr. Pohlgeers	Dr. Sarah Moyer, Dr Katie Pohlgeers, Dave Langdon	Accomplished
Develop social media messages for Facebook, Twitter. Deploy messages at least 4x a week June – August.	Kathy, Dave, Graphic Specialist	Began in May
Select CDC relevant fact sheets and in appropriate languages to have readily accessible and available for sharing with healthcare providers, pregnant women, Metro Agencies, Community Partners, septic tank owners, businesses, general public	Paul, Dave, Kathy, Nick	Began in May
Identify contents for a Zika prevention kit for pregnant women. Assemble 300+ kits. Determine most effective way to deploy kits (OBGYNs? call LMPHW? Online request?)	Paul, Ken, Dave	TBD
Hold a media event with Mayor Fischer to announce mosquito control measures and what people can do	Dr. Joann Schulte, Matt Rhodes, Dave Langdon, Kathy Harrison	TBD

News Conference if and when the first Zika case from a mosquito bite occurs in Louisville	Dave Langdon	TBD
Provide early and regular updates to the mosquito fogging hotline	Nick Hart, Scott Shrader	Ongoing beginning June 1
Use Code Red to provide alerts about fogging routes and boundaries	Nick Hart, Scott Shrader	Ongoing beginning June 1
Regularly update the website with fogging routes and boundaries	Caitlin, Graphic Specialist	Ongoing beginning June 1
Work with Metro TV to provide a story package for the 502 report on prevention and control of mosquitoes (what residents can do)	Dave, Deb Harbsmeier	TBD
Make sure fact sheets, health education materials are available at the front desk for receptionist	Dave, Paul	TBD
Share tips and CDC educational materials via the MHHM listserv every other week	Caitlin, Graphic Specialist, Kathy	TBD
Provide poster, handouts for display and taking in our clinics	Dave, Kathy	TBD
Provide at least three different educational materials or graphics to metro council members for their newsletters	Dave, Kathy	Beginning June 1
Work with Metro Parks, Metro Public Works and Metro Housing Authority, Metropolitan Housing Coalition and New Directions to present to staff or to share educational materials about protecting employees as well as abatement or control in parks, vacant and abandoned properties, low-income housing, section 8 housing etc.	Paul/Env. Staff	TBD
Provide informational sheet to builders, residents who are constructing or modifying septic tanks when they come in for plan approval with Lynn Hannon	Paul/Env Staff	TBD

and Mike Ballard		
Reach out to Louisville Homebuilders Association and Louisville Apartment Association to offer to share educational materials, opportunity to speak to workers, residents		TBD
Reach out to UK extension office. Provide educational materials, ask them to distribute		TBD
Present/provide script to Metro Call for taking calls and complaints. Review proper procedure *(check with Connie, there has been confusion about this)*		TBD

Budget: TBD

Measures of Success:

- Earned Media Coverage and Audience Reach
- Website Hits
- Positive feedback on social media channels; reach of specific Tweets, Facebook shares and likes
- All prevention kits distributed