Zika Virus Disease
Response Annex

November 2016
Version 5.1
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Promulgation Statement

Virginia Zika Task Force was established in February 2016 to meet the dynamic and potentially dangerous threat of Zika virus disease (Zika) in Virginia. Confirmed travel-related cases of Zika in Virginia and the possibility of local, autochthonous transmission demonstrate the need to develop strategies to keep Virginians healthy throughout mosquito season by preventing or mitigating the transmission of Zika.

This Annex is the official response plan for Virginia Zika Task Force/Incident Management Team and supersedes previous versions. All agencies and organizations mentioned in this annex have the authority, either through the Code of Virginia or through this Annex, to conduct all of the tasks outlined herein.

All agencies and organizations with roles and responsibilities for Zika preparedness and response are expected to update, maintain, and train to their policies, plans, and procedures to ensure their ability to prepare for and respond to local transmission of Zika in Virginia.

Virginia Zika Task Force/Incident Management Team remains committed to meeting this challenging threat. The Virginia Department of Health Director of the Office of Emergency Preparedness and/or his or her designee has the authority to update and maintain this Annex.

Signed:

_____________________________________________   _______________
Marissa Levine, MD, MPH, FAAFP     Date
State Health Commissioner
Lead Agency
Virginia Department of Health (VDH)

Support Agencies and Organizations
- Virginia Department of Emergency Management (VDEM)
- Virginia Department of Agriculture and Consumer Services (VDACS)
- Virginia Department of Behavioral Health and Developmental Services (DBHDS)
- Virginia Department of Conservation and Recreation (DCR)
- State Council of Higher Education for Virginia (SCHEV)
- Virginia Department of Education (DOE)
- Virginia Department of Environmental Quality (DEQ)
- Virginia Department of Forestry (VDOF)

Support Agencies and Organizations (continued)
- Virginia Department of Game and Inland Fisheries (DGIF)
- Virginia Department of General Services (DGS) Division of Consolidated Laboratory Services (DCLS)
- Virginia Department of Health Professions (DHP)
- Other departments and agencies of the Commonwealth of Virginia
- Virginia Hospital and Healthcare Association (VHHA) and Regional Healthcare Coordination Centers (RHCC)
- Local Health Districts
- Local governments and privately-owned organizations performing mosquito control activities
- American Red Cross, INOVA Blood Services, and Virginia Blood Services
- Other local and federal partners

Purpose
Zika virus disease (Zika) is a disease that is spread primarily through the bite of an infected Aedes species mosquito. Cases of sexual transmission and maternal-fetal transmission have also been reported, and transmission through blood transfusion is possible. Though the illness is usually mild, and many people will show no symptoms at all, Zika is known to be linked to microcephaly and investigators continue to research the link between Zika and Guillain-Barré syndrome. These are serious conditions that are contributing to significant public anxiety and could have adverse, long-term effects on individuals, health systems, and public health as the number of cases increases.

On February 26, 2016 Governor Terry McAuliffe announced the creation of the Virginia Zika Task Force to coordinate the Commonwealth’s efforts to prepare for and respond to locally transmitted cases of Zika in Virginia. This coordinated effort will require sustainable strategies for communication and sharing information; surveillance and investigation; laboratory testing; vector control; outreach to pregnant women; and safety of the blood supply. The success of the Commonwealth of Virginia in responding to Zika requires that these capabilities be flexible, robust, and sustainable over the long term.

This Annex addresses how the Virginia Zika Task Force/Incident Management Team, led by Virginia Department of Health (VDH), will leverage the powers of state, local, and federal
government and the private and non-profit sectors to meet public health needs in response to the dynamic and evolving threat of Zika in Virginia.

**Scope & Applicability**

This Annex outlines coordinated public health preparedness and response actions within the Commonwealth of Virginia and accounts for cooperation and coordination with the other jurisdictions in Department of Health and Human Services (HHS) Region III: Delaware, Maryland, Pennsylvania, West Virginia, and Washington, D.C. In addition, the Annex will help the Virginia Zika Task Force facilitate coordination among other partners, such as federal and local authorities, hospitals, blood supply services, and mosquito control organizations. This Annex will be utilized in concert with the Commonwealth of Virginia Emergency Operations Plan (COVEOP), as needed, to facilitate and enhance state-level coordination.

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 federal, state, and local entities, as well as blood collection centers and mosquito control organizations;
- Epidemiological surveillance, investigation, and laboratory testing;
- Coordination of Virginia in the US Zika Pregnancy Registry;
- Mosquito surveillance and control as outlined in an Appendix of this Annex;
- 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.

**Situation Overview**

*Description of the Disease*

Zika virus disease is a disease caused by Zika virus that is spread primarily through the bite of an infected *Aedes* species mosquito. Because the virus is spread through the bite of an arthropod, it is a member of a group of conditions known as arboviral diseases. Zika can also be transmitted sexually and from mother to fetus. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis. Symptoms typically start between three and 14 days after being bitten by an infected mosquito and last between several days to a week. The symptoms of Zika are similar to symptoms of other arboviral diseases. Testing for Zika may be necessary to rule out differential diagnoses that include Dengue and Chikungunya. A
commercial assay for the qualitative detection of Zika Virus RNA in acute serum samples is available through some commercial labs.

There is, at present, no known cure or vaccine for Zika. Treatment consists mainly of supportive care to relieve symptoms.

Transmission

Zika virus is transmitted to people primarily through the bite of an infected Aedes species mosquito, specifically the Aedes aegypti (Yellow Fever mosquito) and Aedes albopictus (Asian tiger mosquito) mosquito. Zika is also transmitted via sexual contact from a person infected with Zika to their sexual partners. It can also be transmitted from a pregnant woman to her fetus during pregnancy or birth.

The Zika virus typically remains in the blood of an infected person for one week. To reduce the risk of infecting others, individuals infected with Zika should avoid mosquito bites by remaining indoors or wearing protective, permethrin-treated clothing and mosquito repellent for the first week after the onset of symptoms. Individuals infected with Zika should, if possible, use air conditioning or window and door screens to keep mosquitoes outside. Asymptomatic individuals returning from travel to Zika affected areas should avoid mosquito bites for three weeks. In addition, everyone including non-infected individuals should eliminate standing water from containers around their property, including bird baths, flower pots, used tires, and buckets to reduce mosquito breeding and habitat sites.

Cases of sexual transmission of Zika have been confirmed by Centers for Disease Control and Prevention (CDC). To date, it is not known how long the virus can stay in semen. There is still more to be learned regarding sexual transmission of Zika. Sexual partners can protect each other by using condoms (or other barriers to prevent infection) correctly and consistently during sex (vaginal, anal, oral) or other sexual activities. In addition, travelers who reside in or have traveled to an area with Zika virus who have a pregnant partner should abstain from sexual activity or correctly and consistently use condoms during vaginal, anal, or oral sex for the duration of the pregnancy.

At this time, there is no evidence that Zika can be transmitted from animals to humans.

Zika is rarely fatal and usually mild. Zika is a cause of microcephaly and other severe fetal brain defects. Scientists are studying the full range of other potential health problems that Zika virus infection during pregnancy may cause. There is a suspected link between Zika and serious health conditions, such as Guillain-Barré syndrome. Zika may cause other health problems as well. Knowledge of Zika continues to improve and may prompt the Virginia Zika Task Force to update or change strategies. In the meantime, methods for preventing the transmission of Zika should be shared with the public on an ongoing basis.
Description of the Jurisdiction

The Commonwealth of Virginia covers 42,767 square miles and is comprised of 95 counties and 38 independent cities. The Commonwealth’s population is approaching 8.4 million, with the majority of residents living in the eastern portion of the state. The population continues to increase annually in most areas of the state.

The *Aedes albopictus* (Asian tiger mosquito) is the most common nuisance mosquito in Virginia, and is capable of transmitting Zika to humans. Zika is most commonly transmitted by the *Aedes aegypti* (Yellow Fever mosquito), which is also present, though less common, in Virginia. Mosquito season in Virginia typically lasts from May 1 – October 31.

Healthcare and Public Health Preparedness Regions

There are six healthcare regions closely aligned with five public health preparedness regions in Virginia. (As depicted in Figure 1 below, the Western Public Health Region coordinates with both Near Southwest and Far Southwest Healthcare Preparedness Regions).

Each Public Health Region has a Regional Emergency Health Coordinator who provides technical assistance and coordination for public health emergency preparedness and response within their region.

![Figure 1. Public Health and Healthcare Regions](image)

Planning Assumptions

- Knowledge of Zika is improving over time. Guidance and recommendations from CDC will change as more is learned about Zika.
• Scientists at the Centers for Disease Control and Prevention (CDC) have concluded, after careful review of existing evidence, that Zika virus is a cause of microcephaly and other adverse pregnancy outcomes.

• Pregnant women represent a highly vulnerable population with special needs.

• Zika may continue to be a public health threat during mosquito season each year.

• 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 continental US.

• Virginia is at risk for local transmission of Zika virus by the *Aedes aegypti* mosquito (Yellow Fever mosquito) and the *Aedes albopictus* mosquito (Asian tiger mosquito). Both are competent vectors for Zika virus transmission, though transmission by the *Aedes albopictus* (Asian tiger mosquito) may be more limited than transmission by the *Aedes aegypti* mosquito (Yellow Fever mosquito).

• The City of Richmond and Washington, D.C. have been identified as cities at moderate risk for summertime Zika outbreaks by estimates produced by the National Center for Atmospheric Research.

• 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.

• CDC is investigating the link between Zika and Guillain-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.

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

• VDH has established an Incident Management Team to coordinate the Commonwealth’s response to Zika.

• Mosquito control programs in Virginia are locally funded and are limited to some of Virginia’s most heavily populated jurisdictions in Northern, Central, and Eastern Virginia. Mosquito control can be guided by surveillance for arboviral disease in humans, mosquito surveillance and arboviral testing of mosquitoes, or by mosquito surveillance only.
• Mosquito surveillance and control actions may not be limited to the patient's home but may apply to other relevant sites of potential mosquito exposure (e.g., work sites, recreational sites, etc.).

• Military installations in Virginia that have mosquito control programs are Fort Belvoir, Fort Eustis, Langley Air Force Base, Fort Myers, and the Pentagon.

• 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.

• The public may utilize private mosquito control companies to apply mosquito barrier applications around their property. Therefore, it will be important to integrate mosquito control companies, to the extent possible, into Virginia’s prevention and mitigation strategies.

• 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.

• 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.

• Local health districts response efforts will include conducting human disease surveillance, conducting public outreach and education, approving and coordinating human testing, and further investigating identified cases. As commercial tests become more available and affordable, there may be less need for local health districts to coordinate testing.

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

• Hospitals and providers in Virginia can expect an influx of potential Zika cases to clinics and emergency departments due to high level of public anxiety.

• Pre-event planning is critical to ensure a prompt and effective response to any confirmed locally-transmitted Zika case to prevent or mitigate the spread of the disease.

• State government may provide and/or augment emergency response services that exceed the capabilities of local governments pursuant to the COVEOP.

• In preparation for or in response to one or more confirmed cases of locally-transmitted Zika, the Governor of Virginia may order implementation of the COVEOP and activation of Unified Command.
• The State Health Commissioner will announce the first confirmed case of locally-transmitted Zika in Virginia. In addition, a Declaration of Emergency by the Governor will be considered if Zika presents a major threat to the public.

• 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 Virginia.

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

Policies
All departments and agencies assigned responsibilities within this Annex will develop and maintain the necessary plans, standard operating procedures, mutual aid agreements, and model contracts to successfully accomplish their tasks.

Organizational Structure
The lead agency for the Virginia Zika Task Force is Virginia Department of Health (VDH).

Support agencies and organizations for Zika prevention, mitigation, and response include: Virginia Department of Emergency Management (VDEM); Virginia Department of Agriculture and Consumer Services (VDACS); Virginia Department of Behavioral Health and Developmental Services (DBHDS); Virginia Department of Conservation and Recreation (DCR); State Council of Higher Education for Virginia (SCHEV); Virginia Department of Education (DOE); Virginia Department of Forestry (VDOF); Virginia Department of Game and Inland Fisheries (DGIF); Virginia Department of General Services (DGS); Division of Consolidated Laboratory Services (DCLS); Virginia Department of Health Professions (DHP); all departments and agencies of the Commonwealth of Virginia; Virginia Hospital and Healthcare Association (VHHA) and Regional Healthcare Coordination Centers (RHCC); local health districts; local public works; privately-owned mosquito control organizations; American Red Cross; INOVA Blood Services; Virginia Blood Services; and other local and federal partners. See Figure 2 below.

Due to the potential complexity of a Zika outbreak in Virginia, a Unified Command (UC) structure consistent with the National Incident Management System (NIMS) may be created to enhance coordination of the Commonwealth’s prevention, response, and mitigation activities. A Unified Command/Incident Management Team organization chart is included as an appendix to this document.

The Virginia Emergency Operations Center (VEOC) will be augmented to the level necessary to manage one or more confirmed locally-transmitted Zika cases or Zika outbreaks in Virginia. If deemed necessary by Unified Command, a Joint Information Center (JIC) will be activated to provide timely release of accurate information. Requests for assistance from localities and appropriate state agencies will be facilitated via WebEOC per standard operating procedure. If necessary, the Virginia Emergency Support Team (VEST) and associated Emergency Support Functions will coordinate response operations through
integration with the VDH Incident Management Team (IMT) and Regional Hospital Coordinating Centers (RHCCs).

Figure 2. Virginia Zika Task Force Organization Chart
Roles and Responsibilities

Virginia Department of Health (VDH) Central Office

- Support protection of public health and safety and support the provision of assistance to governments, businesses, and individuals during a Zika outbreak (e.g., one or more confirmed locally-transmitted cases).
- Support epidemiological investigations of suspected travel-related and locally-transmitted cases of Zika.
- Communicate with local health districts, the state laboratory, and neighboring state health departments to ensure coordinated epidemiological operations.
- Establish Zika testing approval criteria and procedures.
- Provide specific guidelines for data management and communication of test approvals and results reporting.
- Track and report confirmed travel-related and locally-transmitted cases of Zika in Virginia.
• Provide guidance and updated information to local health departments, healthcare facilities, providers, and public health partners using established protocols and the Health Alert Network (HAN).
• Lead the development of messaging to address the current status of Zika in the Commonwealth.
• Develop and, as necessary, implement plans that address potential scenarios that pose the risk of further spread of Zika.
• Ensure that accurate situational awareness regarding Zika activity in the Commonwealth is maintained, while at the same time ensuring that any information shared complies with applicable laws, regulations, and policies regarding the protection of the confidentiality of personal health information.

Local Health Districts
• Coordinate the submission of Zika-related specimens to DCLS for testing, as needed, and provide guidance to healthcare providers.
• Conduct epidemiological investigations related to Zika when a case is identified, implementing public health actions to minimize the risk of disease spread.
• Share relevant information with VDH Central Office, local partners (e.g., local governments, local mosquito control programs, etc.) and/or Virginia Zika Task Force or Unified Command partners, as appropriate.
• Serve as resource for local governments, local hospitals, providers, emergency responders, and the public with questions about Zika.
• Manage Medical Reserve Corps (MRC) volunteers.
• Some health districts may oversee mosquito surveillance and control activities in their localities.

Virginia Department of Emergency Management (VDEM)
• Share information to determine a common operating picture with VDH.
• Issue mission assignments to ESF primary or support agencies for Zika response and mitigation, as needed.
• Assist VDH with development of incident specific contingency plans.
• Gather information to build situational awareness.
• Coordinate volunteer and donation efforts in partnership with local health districts.
• Assist VDH, as necessary, in the procurement of supplies to assist with prevention, mitigation, and response activities.
• Assist VDH in the establishment and management of a Joint Information Center (JIC), if needed.
• Continue regional coordination efforts.

Virginia Department of Agriculture and Consumer Services (VDACS)
• VDACS Office of Pesticide Services has primacy for pesticide regulation in Virginia.
• Provide information/messaging about pesticides and their use for mosquito control.
• Provide training to pesticide businesses in keeping with the Virginia Pesticide Control Act and Regulations.

Virginia Department of Behavioral Health and Developmental Services (DBHDS)
• Provide behavioral health assistance and support to the index patients, his/her contacts, and their families and neighbors, as needed.
• Serve as the behavioral health subject matter experts for ESF-6 and ESF-8.
• Support the Joint Information Center (JIC) and Public Information Officer (PIO), as needed, by reviewing and/or creating messaging sensitive to behavioral health.
• Work with Community Services Boards (CSBs) to develop an action plan to address all appropriate services and supports.
• Work with the FEMA Region III Individual Assistance Coordinator and Behavioral Health Coordinator to assure DBHDS plans will mesh with adjacent state plans and services.
• Provide shift or daily situation reports to ESF-8 as needed.
• Activate Disaster Response Team (DRT) as necessary.

Virginia Department of Medical Assistance Services (DMS)
• Provide prescriptions for mosquito repellant to qualified recipients.

Virginia Department of Conservation and Recreation (DCR)
• Mosquito Control Task Group Member.

Virginia Department of Education (DOE), State Council of Higher Education for Virginia (SCHEV) and Virginia Community College System (VCCS)
• Support Virginia Zika Task Force as needed

Virginia Department of Environmental Quality (DEQ)
• Mosquito Control Task Group Member.
• Provide oversight of pesticide applications that result in pesticides being applied to or over ‘waters of the state’.

Virginia Department of Forestry (VDOF)
• Mosquito Control Task Group Member.

Virginia Department of Game and Inland Fisheries (DGIF)
• Mosquito Control Task Group Member
Virginia Department of General Services (DGS) – Division of Consolidated Laboratory Services (DCLS)

- Provide guidance to local health departments, hospital laboratories, and providers on the handling, packaging, and shipping of clinical samples collected from persons under investigation for Zika.
- Provide information to local health department, hospital laboratories and providers regarding laboratory testing availability.
- Conduct testing for Zika virus from human specimens and mosquito pools, as requested and approved by VDH.
- Notify providers and VDH of presumptive, inconclusive, and confirmed Zika virus test results.
- Provide laboratory test result interpretation and work with VDH to provide guidance for additional laboratory testing.

Virginia Department of General Services (DGS) – Virginia Distribution Center (VDC)

- Maintain cache of insect repellant and provide to areas where local transmission is identified.

Virginia Department of Health Professions (DHP)

- Support Virginia Zika Task Force as needed.

Virginia Hospital and Healthcare Association (VHHA)

- Support Virginia Zika Task Force as needed.

Regional Healthcare Coordination Centers (RHCCs)

- Support the Commonwealth’s Zika prevention, response, and mitigation activities by sharing Zika-related information with appropriate partners, as needed.
- Coordinate resource needs within the region and the state.

American Red Cross, INOVA Blood Services, and Virginia Blood Services

- Ensure the safety of the blood supply

Virginia Mosquito Control Association

- Mosquito Control Task Group Member

Concept of Operations

Intent

The Commonwealth of Virginia will prevent or mitigate the local transmission of Zika virus disease in Virginia.
Zika-related prevention, response, and mitigation actions addressed in this Annex will occur in five risk-based phases corresponding to categories of risk identified by CDC:

<table>
<thead>
<tr>
<th>STAGE</th>
<th>PHASE LEVEL</th>
<th>TRANSMISSION RISK CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Incident</td>
<td>0</td>
<td>Preparedness – Vector present or possible in the state</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Mosquito Season – Aedes vector species mosquito biting activity. Introduced-travel-related or sexually transmitted cases</td>
</tr>
<tr>
<td>Suspected / Confirmed Incident</td>
<td>2</td>
<td>Confirmed Local Transmission – Single, locally acquired case, or cases clustered in a single household and occurring &lt; 2 weeks apart</td>
</tr>
<tr>
<td>Incident / Response</td>
<td>3</td>
<td>Confirmed Multiperson Local Transmission – Zika virus illnesses with onsets occurring ≥ 2 weeks apart but within an approximately 1 mile (1.5 km) diameter</td>
</tr>
</tbody>
</table>

Virginia will continue to prepare for one or more cases of confirmed locally-transmitted Zika in the Commonwealth by coordinating statewide activities through the Virginia Zika Task Force or, if necessary, Unified Command.

Prevention, response, and mitigation activities will occur throughout each phase in the following areas:
- Communication
- Surveillance and Investigation
- Laboratory testing
- Mosquito control
- Coordination with Healthcare Providers
- Outreach to Pregnant women
- Blood safety

Activities in each phase will build on and may occur concurrently with activities in subsequent phases. In addition to activities included in the categories listed above, administrative activities, training, and exercises may occur throughout each phase as well.

Virginia’s response to one or more cases of confirmed locally-transmitted Zika in the Commonwealth may include, but may not be limited to:
- Tracking and reporting to appropriate partners the number of confirmed cases of travel-related or locally-transmitted Zika;
- Sharing information and making appropriate notifications;
- Confirming the presence of Zika through laboratory testing of humans and mosquitoes;
- Conducting enhanced surveillance of mosquitoes and humans for Zika;
- Conducting or supporting public education and outreach events;
- Providing timely and accurate information to the public through a virtual Joint Information Center (JIC), if necessary;
- Supporting localized or community property inspection or cleanup efforts, as appropriate;
• Engaging in behavioral health efforts to support families and communities affected by Zika;
• Enacting appropriate disease intervention measures, if necessary.

**Phase 0: Preparedness**

Prior to mosquito season, most Zika-related activities will be preventive or in preparation for confirmed locally-transmitted cases.

**Communication**

**Public Education and Outreach**

VDH will work with Virginia Zika Task Force 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;
- Preventing sexual transmission;
- Accessing and using effective contraception;
- 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; and
- Other topics as they arise.

Virginia Zika Task Force multimedia campaign will include:

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

VDH will work to update scripts for Virginia 211 to include Zika messaging and will update Frequently Asked Questions (FAQs) and other resource materials on the VDH website.

Virginia Zika Task Force will initiate statewide and/or support local public information campaigns encouraging 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.

Surveillance and Investigation

VDH will conduct surveillance for cases of Zika virus disease, to include 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. Existing surveillance and testing algorithms will continue to evolve as more information becomes available during mosquito season, with the goal of promptly identifying locally transmitted cases when possible.

VDH will provide up-to-date guidance to healthcare providers regarding testing and clinical management.

Guidance from VDH Central Office to local health districts will include specific guidelines for data management and communication of test approvals and results reporting.

VDH DSI will continue to publish weekly Zika case reports.

Pregnancy Registry

VDH Central Office and local health districts will 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.

Laboratory Testing

Coordinating Testing of At-Risk Individuals for Zika

VDH will establish and share with local health districts and clinicians across the state Zika testing approval criteria and procedures. Health providers will assess their patients’ risk for Zika infection based on travel history, sexual partner’s travel history, presence of clinical symptoms, history of mosquito bite exposure, and whether the patient is pregnant or trying to become pregnant. Patients who meet the criteria for testing will work with their clinician and the local public health department, with assistance from VDH Central Office if needed, to assess each patient recommended for testing to determine if travel history, exposures, symptoms, and/or pregnancy status qualify for public health testing, and coordinate the collection and delivery of the approved sample types (i.e. Blood sample in a serum separator tube, urine sample, etc.) to DCLS for testing, follow-up with the providers, and conduct further investigation if a case is suspected and/or confirmed.

As commercial tests for Zika virus become more available, VDH will continue to provide technical assistance regarding the interpretation of laboratory results upon request from health care providers.
Mosquito Control

Virginia Zika Task Force will review local mosquito control programs to assess their capacity and capabilities. The Task Force will also assist localities with reviewing mosquito surveillance activities to assess whether historical maps of *Aedes aegypti* (Yellow Fever mosquito) and *Aedes albopictus* (Asian tiger mosquito) distribution are accurate. Additionally, the Task Force will work to develop a communication network to ensure timely exchange of information. Public education campaigns will include not only information on personal protective measures, but also how citizens can reduce/eliminate breeding sites for *Aedes aegypti* and *Aedes albopictus*.

Virginia Zika Task Force will plan statewide or 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; and
- Procedures for the systematic collection and analysis of vector distribution and resistance testing methods can be found in the Virginia Mosquito Response Plan Annex.

Coordination with Healthcare Providers

VDH, coordinating through a clinical advisory group to the Virginia Zika Task Force, will plan and prepare for a potential demand for care for clinically challenging cases. This work will include convening a Zika Clinical Advisory Group consisting of experts in maternal health (OB/Gyn), pediatrics, neurology, and infectious disease practice. This group will work to identify resources and health care providers that can provide services for infected pregnant women with signs of congenital infection, and their infants that may need specialty care after birth.

Outreach to Pregnant Women

VDH will continue routine surveillance for suspected Zika virus infections, including for pregnant women through OB/GYN clinics and other providers.

Virginia Zika Task Force will identify resources 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 will include travel advisories, mosquito prevention tips, and information about preventing sexual transmission of Zika. Some strategies to distribute these educational resources include but are not limited to posting on the VDH
website, Dear Clinician letters, clinical websites, and locations in the community such as daycares, OB/Gyn clinics, grocery stores, WIC clinics, public libraries, doctors’ offices, and worksites.

Local health districts will 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.

**Blood Safety**

Virginia Zika Task Force will consult with local blood collection centers on blood safety contingency plans and communication methods to share time sensitive information regarding Zika cases that are suspected to be locally acquired.

American Red Cross, INOVA Blood Services, and Virginia Blood Services 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. American Red Cross is working to implement the FDA guidance released on August 26, 2016, recommending universal Zika testing of donated blood and blood products in the U.S.

Virginia Zika Task Force will review CDC toolkit for investigation of transfusion-transmitted infection.

**Virginia Zika Task Force/Unified Command Schedule and Accounting Procedures**

Virginia Zika Task Force will continue to hold regular meetings and will confer regularly with HHS Region III states.

- **Finance/Administration:** Virginia Zika Task Force/Unified Command partners will track expenses related to supporting, responding, and providing services to Zika-related incidents. Expenses will be documented on standardized expense spreadsheets, and other data capture formats, as approved by Virginia Zika Task Force/Unified Command. Instructions for submittal of expense documentation and determination of qualifying expenses for reimbursement will be provided by the Finance and Administration Section in Unified Command.

**Training and Exercises**

Virginia Zika Task Force/Unified Command will participate in and support Zika-related training and exercises, as appropriate, in order to identify best practices, lessons learned, and
areas for improvement. Training and exercise activities will occur throughout each phase of operations, if possible.

_Phase 1: Mosquito Season_

This phase of prevention, response, and mitigation activities coincides with biting activity of *Aedes aegypti* (Yellow Fever mosquito) or *Aedes albopictus* (Asian tiger mosquito). Mosquito season in Virginia typically lasts from May 1 through October 31. Activities from Phase 0 will continue during this phase.

**Communication**

Virginia Zika Task Force will continue a statewide communications campaign, with primary messaging focusing on awareness, personal protection against mosquitoes, and residential mosquito habitat and breeding site reduction.

Public education and outreach activities 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;
- Working with airport authorities to display Zika-related signage and/or run public service announcements;
- Running animated videos in movie theatres for eight weeks; and
- Partnering with radio and television meteorologists to share messages related to mosquito-breeding weather conditions.

Virginia Zika Task Force 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.

Local health districts will work with healthcare providers to counsel their patients with Zika virus disease 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; and wearing long, light-colored clothing. These patients should also receive counseling regarding the prevention of sexually transmitted Zika virus as appropriate.

**Surveillance and Investigation**
VDH will work with healthcare providers to encourage reporting of suspect cases to public health and to establish a process for assessment and testing of suspected locally-transmitted cases, to include establishing:

- Symptom and potential exposure history;
- Assessment of history of travel, transfusion or transplantation, and illness in sexual contacts, with suspicion of local transmission increasing if none is identified in a person with symptoms compatible with Zika;
- Patient’s likely geographic area of risk for exposure (home, work, public space, or other area).

Enhanced surveillance strategies to identify cases of local transmission may include surveillance around travel-associated cases (household contacts, sexual partners, etc.); investigations of unusual clusters of rash illness; and implementation of expanded testing criteria for clinically compatible cases with no known exposure.

VDH will maintain updated internal guidelines, procedures, and data management activities as well as external communications conducted through the VDH website.

**Laboratory Testing**

DCLS, in consultation with VDH and local health districts, will continue to offer appropriate laboratory testing to those that meet testing criteria, based on the most recent CDC guidance and as approved by VDH.

Local health districts will continue to collect data on all persons approved for testing and for whom testing indicates Zika virus infection, and identify exposure risks.

Virginia Zika Task Force will continually assess the ongoing status of DCLS’ preparedness for a potential surge in requests for laboratory testing of humans and mosquito pools for Zika virus.

VDH and local health districts will continue to assess cases and make recommendations for laboratory testing for pregnant women and other at risk individuals based on the most recent CDC guidance.

DCLS will continue to provide updated guidance and instructions to clinical laboratories regarding Zika specimen collection, specimen submission, testing capabilities at DCLS and the CDC, and interpretation of test results using a variety of communications (fax, email, website updates).

**Mosquito Surveillance and Control**
Virginia Zika Task Force will leverage partnerships with local governments and private sector and non-profit organizations to identify and disrupt mosquito breeding grounds. To achieve the goal of surveying and monitoring vector populations during Phase 1, the Virginia Zika Task Force Mosquito Surveillance and Control Task Group will:

- Survey and monitor vector populations, including initiating mosquito surveillance in targeted areas for *Aedes albopictus* (Asian tiger mosquito) to determine abundance and distribution (via a combination of pre-existing mosquito surveillance programs and a seasonal VDH-DEE mosquito surveillance program intended to help serve localities without this capability);
- Perform searches for immature mosquito or larval stages;
- Support or initiate adult mosquito sampling and submission for laboratory of mosquito pools in targeted communities;
- Initiate vector control response to an introduced case, per the Virginia Mosquito Response Plan. Support or initiate preventive adult mosquito control to reduce adult mosquito populations, when appropriate and resources permit;
- Conduct rapid insecticide resistance testing for local mosquito populations, if resources and technical expertise permits; and
- Actively engage community through communication products that promote personal protection and risk avoidance measures.

VDH will assist with planning and implementing local and state mosquito surveillance and control procedures surrounding patients who are deemed appropriate for “targeted” mosquito surveillance and control measures as outlined in the Virginia Mosquito Response Plan Appendix.

To evaluate vector status in the vicinity of known cases, in addition to routine mosquito surveillance and control actions that are available, “targeted” mosquito surveillance and control activities, within an approximate 150 meter radius around the individual’s home and other relevant sites of potential mosquito exposure (e.g., worksites, recreational sites, etc.) may be considered as resources permit. Particular attention should be paid to ensuring the confidentiality of the affected individual. Details and procedures regarding these activities can be found in the *Virginia Mosquito Response Plan Appendix*.

Internal procedures for local health department staff, including guidance for sharing information with local mosquito control programs, can be found in the Virginia Mosquito Response Plan Appendix and the Virginia Disease Control Manual (DCM), an internal VDH document.

**Outreach to Pregnant Women**

Virginia Zika Task Force will continue to support outreach and educational messaging regarding prevention of mosquito bites and prevention of sexual transmission of Zika.
VDH Central Office and local health districts will continue outreach to healthcare providers that care for pregnant women and women of reproductive age.

**Virginia Zika Task Force/Unified Command Schedule**

Virginia Zika Task Force will engage and hold regular meetings with state mosquito surveillance and control partners to discuss plans and progress.

Virginia Zika Task Force will continue to hold regular meetings and will confer regularly with HHS Region III states.

**Phase 2: Confirmed Local Transmission**

Prevention, response, and mitigation activities in this phase occur when a single, locally acquired case, or cases clustered in a single household and occurring <2 weeks apart occurs in Virginia. Activities from Phase 0 and Phase 1 will continue during this phase. Virginia Unified Command may be established during this phase, if necessary.

**Communication**

Virginia Zika Task Force/Unified Command JIC 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 Office of Risk Communication and Education (ORCE). See Communications Plan Appendix for more information.

Virginia Zika Task Force/Unified Command JIC will work with local governments and local health districts to intensify public outreach and education activities 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; and make adjustments to communications plans as needed;
- Targeted messages for pregnant women.

Virginia Zika Task Force/Unified Command JIC will work with local public relations departments and local or regional virtual operations support teams (VOSTs) to monitor local news stories and social media postings to determine accuracy of information, identify messaging gaps, and make adjustments to communications as needed.

**Surveillance and Investigation**
VDH Central Office and local health districts will continue surveillance including actions to determine if cases represent isolated single transmission chains or separate occurrences.

VDH will determine the geographic areas to initiate indicated public health interventions including case surveillance to identify other possible cases of local transmission. Designating local areas will be based on epidemiologic parameters established by VDH with consultation and technical assistance from CDC.

Surveillance efforts include strategies such as assessing for illness among household members and sexual partners of cases.

Local health districts will consider expanding surveillance for human cases in immediate vicinity of known cases, and may consider working with local partners to conduct household and door-to-door surveillance to identify clinically compatible cases (e.g., consideration of uroscopy).

VDH DSI will enhance local surveillance for human cases, to include, for example, conducting local clinician outreach and syndromic surveillance in nearby hospitals, private laboratories, and urgent care centers.

VDH Central Office and local health districts will communicate with healthcare providers to increase awareness and recognition of persons with Zika-compatible symptoms.

Local health districts will work with healthcare providers to counsel individuals with locally-transmitted Zika to take precautions to avoid exposure to local mosquito populations by: regularly removing potential mosquito habitats and breeding sites from their personal property; using mosquito repellant; using air conditioning, if available; using window and door screens, if possible; and wearing long, light-colored clothing.

DSI will notify CDC. DSI and DEE will continue to ensure case reporting to CDC ArboNET. DSI and OFHS will continue to ensure eligible pregnant women are linked to the US CDC Zika Pregnancy Registry.

State officials will be notified of confirmed local transmission.

**Laboratory Testing**

VDH and local health districts will continue to work in collaboration with DCLS to provide laboratory testing for pregnant women and/or their sexual partners or other at-risk individuals based on the most recent CDC guidance. In the event of documented local transmission, DCLS would collaborate with the affected local Health Districts to provide laboratory testing of blood specimens and also urine specimens collected from individuals during community surveillance activities.
Mosquito Surveillance and Control

Per guidance in the Mosquito Response Plan, when epidemiologic evaluation suggests a likely local transmission event, Virginia Zika Task Force/Unified Command will work with local governments, local public works, and private sector mosquito control organizations to assess the situation and determine the level of response and determine areas to initiate indicated public health interventions including intensified vector surveillance and control, if indicated by mosquito surveillance findings.

Guided by epidemiologic evaluation and this assessment, Virginia Zika Task Force/Unified Command will initiate immediate vector control actions to include:

- Establishing the limits of the affected area;
- Collection of vector data (mosquito collection and testing);
  - DCLS will continue to perform laboratory testing of mosquito pools in targeted communities.
- Implementation of a control plan. Team will conduct intensified larval and adult mosquito control (i.e., source reduction and insecticide applications) in a 150 meter radius (or other boundary, as deemed appropriate) around the home or other likely point of exposure of a patient with confirmed locally-transmitted Zika as appropriate. A decrease in vector density is a measure of the efficacy of treatment. Mosquito control activities around other areas where individuals spend a considerable amount of time (e.g., workplace) and have mosquito exposure of viremic or potentially viremic patients as recommended below may also be considered and should include site assessment.

Mosquito control activities may include, but are not limited to residential mosquito habitat and breeding ground reduction, outdoor space spraying, and indoor residual spraying, if needed and resources permit. Abiding by all applicable laws including those pertaining to accessing private property is important. Localities without existing mosquito control programs should consider plans to implement these measures; planning options to consider are outlined in the Virginia Mosquito Response Plan.

VDH will support efforts to conduct rapid insecticide resistance study for local mosquito populations.

Outdoor space spraying will be conducted in a manner that is least harmful to the environment and does not result in buildup of immunity in local mosquito populations. Duration of activities should be no less than 45 days after the date of onset of the last known case (the time it is possible for an Aedes feeding on that person to continue to transmit Zika virus.)

Virginia Zika Task Force will continue to evaluate the need for federal assistance.
Outreach to Pregnant Women

Virginia Zika Task Force/Unified Command 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.

Ensure pregnant women and their sexual partners are aware of the presence of Zika virus in the local area and what precautions they should take to prevent being bitten/infected.

VDH and local health districts will continue to collect case information on cases of Zika virus disease in pregnant women, for inclusion in CDC’s US Zika Pregnancy Registry.

Blood Safety

Virginia Zika Task Force/Unified Command will notify local blood collection agencies of the presence of confirmed locally-transmitted Zika.

Virginia-based blood collectors will continue to comply with FDA, CDC, AABB, and Commonwealth of Virginia guidance regarding the collection of blood in the area with active transmission of Zika.

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); and
- Importation of blood products from unaffected areas of Virginia and the US, as necessary.

Virginia Zika Task Force/Unified Command Schedule

The Governor of Virginia or State Coordinator of Emergency Management will activate Virginia Zika Unified Command for Zika during this phase, if necessary.

Unified Command will determine if there is a need for assistance from a CDC Field Team, such as Epi Aid or a rapid response team, to provide vector control, risk communication, technical, and/or logistical support.

Unified Command will continue to hold regular meetings and will confer regularly with HHS Region III states. VDH DSI will continue to publish weekly Zika case reports. Unified Command will publish weekly situation reports.
**Phase 3: Confirmed Multiperson Local Transmission**

Prevention, response, and mitigation activities in this phase occur when multiple cases of locally-transmitted Zika virus disease have been confirmed in a single jurisdiction in Virginia with onsets occurring $\geq 2$ weeks apart but within an approximately 1 mile diameter. Within the jurisdiction, there may be individual cases or case clusters in a single household, neighborhoods or communities. Activities from Phases 0-2 will continue during this phase.

**Communication**

Virginia Unified Command will intensify public education and outreach activities in and around the affected jurisdictions. Social media posts and tweets, targeted media monitoring, and specific messaging for pregnant women will increase in frequency.

VDH will determine if a call center should be stood up based on the number of calls being received.

**Surveillance and Investigation**

VDH will continue and intensify surveillance for human cases in the affected jurisdictions to include clinician outreach and syndromic surveillance as described in previous phases.

If conditions are met as per CDC Draft Interim Zika Response Plan, (2 + cases within an appropriate area and time frame) this information will be shared with partners, including the CDC, to designate an affected area and generate maps of the affected area.

The Task Force will determine the risk and extent of ongoing local transmission through enhanced surveillance and expanded vector assessment activities. Based on epidemiologic, entomologic, and environmental information states will define geographic areas for targeted public health interventions (e.g., vector surveillance and control, enhanced case surveillance, community outreach, etc). In the unlikely event that Zika virus transmission occurs at an intensity that presents a significant ongoing risk to pregnant women, travel guidance should be considered and issued to communicate that pregnant women should avoid non-essential travel to the impacted area. This area identified should be the smallest easily identifiable area that completely encompasses the geographic area for intervention. These decisions will be made on an individualized basis unique to each scenario.

**Laboratory Testing**

DCLS will continue to work in collaboration with VDH and local health districts to provide laboratory testing for pregnant women and/or their sexual partners or other at-risk individuals based on the most recent CDC guidance.
In the event of local transmission, DCLS would continue to provide laboratory testing of urine and/or blood specimens collected during community surveillance activities by the affected local Health Districts.

**Mosquito Control**

Virginia Unified Command will work with local governments, local public works, and private sector mosquito control organizations to conduct larval and adult mosquito control. Recommendations for the scope of such control will be informed by Division of Environmental Epidemiology (DEE) in consultation with Unified Command.

When appropriate, as per CDC Zika Interim Response Plan, VDH will establish the limits of the affected area per the internal guidance document “Determination of a Zika Transmission Area”.

Control plans should be tailored to meet the needs of the jurisdiction(s) and will be part of an integrated mosquito management approach. Mosquito control activities should be planned as necessary to achieve adequate control. A decrease in vector density is a measure of the efficacy of treatment. Truck mounted ultra-low volume (ULV) applicators or aerial spraying can be considered but should be based on local assessment of spatial risk. If aerial spraying is deemed appropriate, VDH is obligated to give notice to the public in the areas impacted. Further, VDH will work with state agencies for notifications to relevant stakeholders, such as the State Beekeeper. Community clean-up activities will continue as outlined in previous phases. Per CDC Guidance, duration of vector control activities should be no less than 45 days after the date of onset of the last known case.

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 a manner that is least harmful to the environment, is consistent with integrated mosquito management, and minimizes the risk of the buildup of immunity in local mosquito populations.

For areas where air conditioning and screens are not widely available, Virginia Unified Command will consider conducting indoor residual spraying in at-risk homes or other physical areas that have been considered as potential sites of high risk exposure (e.g., workplaces). Interventions for high-risk populations, including pregnant women, include mosquito-proofing homes through installation of screens and air conditioning, if necessary.

Virginia Unified Command will support local governments and local public works in monitoring effectiveness of vector control efforts through mosquito trapping surveillance.

Virginia Unified Command will work with local governments, local public works, and private sector mosquito control organizations to conduct larval and adult mosquito control.
Recommendations for the scope of such control will be informed by Division of Environmental Epidemiology (DEE) in consultation with Unified Command.

DCLS will perform laboratory testing of mosquito pools as requested by VDH DEE based on information relating to local transmission of Zika virus.

**Outreach to Pregnant Women**

Virginia Unified Command JIC will work with local governments and local health districts to:

- Provide up-to-date public health recommendations to pregnant women regarding travel to the affected jurisdiction(s) in Virginia;
- 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 jurisdictions, such as mosquito-proofing homes and providing additional materials such as insect repellent, larvicide, and educational materials;
- Revise procedures for the testing of asymptomatic pregnant women in affected jurisdictions; and
- 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.
- Consider enhancing the availability of long-term contraceptives; this should be dependent on the number of cases and their geographic and temporal distribution as a measure of the extent of mosquito-borne transmission.

**Blood Safety**

VDH will implement the notification procedure between VDH and blood centers and health departments of neighboring states (e.g., Maryland, DC, etc.).

The American Red Cross, INOVA Blood Services and Virginia Blood Services 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 Virginia.

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 and implementation of universal Zika testing for all donated blood and blood products in the U.S.

**Virginia Zika Task Force/Unified Command Schedule**

Virginia Unified Command will determine the geographic boundaries that will be used for aggressive response efforts.
The Governor of Virginia or State Health Commissioner will designate the affected jurisdiction(s) as Areas of Active Zika Transmission. Decisions will be guided by the internal interim guidance documents “Identification of Zika Transmissions Area and Action Steps for Local Health Departments” – Appendix F.

Virginia Unified Command will notify CDC of designated Areas of Active Zika Transmission by calling 770-488-7100.

Unified Command will continue to provide situational awareness to partners by holding regular meetings and conferring regularly with HHS Region III states. VDH DSI will publish regular Zika case reports. Unified Command will publish daily situation reports.

Critical Information Requirements

Timely and accurate information is critical to Virginia’s successful response to one or more cases of confirmed locally-transmitted Zika. The following list includes information that must be reported to Virginia Zika Task Force/Unified Command or other partners in order to facilitate a timely and proper response:

- Providers will notify local health departments of suspected or confirmed cases of Zika virus disease;
- DCLS notifies submitters and DSI of presumptive and confirmed test results;
- Local health departments notify DSI of probable/confirmed Zika cases;
- Virginia Zika Task Force/Unified Command informs CDC of designation of Areas of Active Zika Transmission;
- Known locations of Zika transmission should be shared with appropriate local partners, if consent is given and/or approved by VDH Central Office;
- Any gaps in Virginia Zika Task Force/Unified Command planning.

Authorities

- Isolated or Quarantined Persons (§32.1-44, Code of Virginia), as amended.
- Isolation or Quarantine of Persons with Communicable Disease of Public Health (§32.1-48.05 through 32.1-48.017, Code of Virginia), as amended.

References

- See Appendix G – Resources and References for Zika Public Education and Outreach
### Appendix A – Zika Task Force / Task Group Membership, 7/16/2016

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<tr>
<th>Agency / Organization</th>
<th>Representative</th>
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<tr>
<td>Department of Health</td>
<td>Marissa Levine, Commissioner</td>
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<td>Hughes Melton, Chief Deputy</td>
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<td>Bob Hicks, Dep Comm CHS</td>
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<td>Letha Fisher, CHS</td>
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<td>Richard Corrigan, Dep Comm,</td>
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<td>Governor’s Office, Deputy Chief of Staff</td>
<td>Suzette Denslow</td>
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<tr>
<td>Virginia Municipal League</td>
<td>Janet Areson</td>
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<tr>
<td>Secretary Veterans’ and Military Affairs</td>
<td>Deputy, Jaime Areizaga-Soto</td>
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<tr>
<td>Department of General Services / DCLS</td>
<td>Denise M. Toney, Ph.D., HCLD (ABB)</td>
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<td></td>
<td>Angela Fritzinger, Ph.D.</td>
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<td></td>
<td>Latoya Griffin Thomas, Ph.D.</td>
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<tr>
<td>Department of Health Professions</td>
<td>Jay Douglas, Executive Director of the Virginia Board of Nursing</td>
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<tr>
<td>Department of Inland Game and Fisheries</td>
<td>Veterinarian, Dr. Megan Kirchgessner</td>
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<tr>
<td>Virginia Mosquito Control Association / Chesapeake Mosquito Control Commission</td>
<td>Dreda Symonds, Director</td>
</tr>
<tr>
<td>Department of Conservation and Recreation</td>
<td>Rochelle Altholz, Deputy Director of Administration and Finance</td>
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<tr>
<td>VA Hospital and Healthcare Association</td>
<td>Dr. Tom Ryan, Senior Medical Advisor</td>
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<tr>
<td>VA Hospital and Healthcare Association</td>
<td>Morris Reece, Technical Advisor to VHHA for Emergency Preparedness</td>
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<tr>
<td>Department of Forestry</td>
<td>Lori Chamberlin</td>
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<td>Forest Health Manager</td>
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<td>Virginia Association of Counties</td>
<td>Phyllis Errico, General Counsel</td>
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<tr>
<td>Department of Education</td>
<td>Robert Kipper</td>
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<tr>
<td>Department of Behavioral Health and Developmental Services</td>
<td>Dawn Adams</td>
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<tr>
<td>Department of Agriculture and Consumer Services</td>
<td>Liza Fleeson Trossbach, Program Manager, Office of Pesticide Services</td>
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<tr>
<td>Department of Environmental Quality</td>
<td>James Golden</td>
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<tr>
<td>American Red Cross</td>
<td>Bill FitzGerald, Senior Advisor</td>
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<td></td>
<td>Corrine Goldberg, Medical Director</td>
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<tr>
<td>Department of Emergency Management</td>
<td>Brett Burdick</td>
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<td>Donna Pletch</td>
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<td>Jeff Stern</td>
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<tr>
<td>Virginia Blood Services</td>
<td>Chelsea Sheppard, Med Director</td>
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<tr>
<td>Medical Society of Virginia</td>
<td>Melina Davis-Martin</td>
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<td>Lauren Bates-Rowe</td>
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<td>Agency / Organization</td>
<td>Representative</td>
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<td>State Council of Higher Education for Virginia</td>
<td>Alan Edwards</td>
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<tr>
<td>Department of Transportation</td>
<td>John Scrivani</td>
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<td>NAVENPVNTMEDU TWO VA</td>
<td>Yans, Matthew W LT USN</td>
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<tr>
<td>Lt. Governor’s Office</td>
<td>Rodgers, Alexis</td>
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<tr>
<td>Office of the Attorney General</td>
<td>Kurz, Robin V. Kronenberg, Grant E.</td>
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</tbody>
</table>

Functional Task Groups

- Mosquito Control Task Group
  - Virginia Mosquito Control Association, Dreda Symonds Lead
  - VDH, David Gaines
  - Department of Agriculture and Consumer Services
  - Department of Environmental Quality
  - Secretary Veterans’ and Military Affairs (Coordinate w/ DOD Installations)
  - Department of Conservation and Recreation
  - Department of Inland Game and Fisheries
  - Department of Forestry
  - Department of Agriculture and Consumer Services
  - Department of General Services, Division of Consolidated Laboratory Services
  - Department of Transportation

- Blood Supply Security Task group
  - American Red Cross
  - VDH Office of Epidemiology

- External Communications Task Group
  - VDH PIO, Maribeth Brewster, Lead
  - All TF agencies and Task Groups
Appendix B – VDH Zika Incident Management Team
## Appendix C – Virginia Blood Services Contact List

<table>
<thead>
<tr>
<th>Organization</th>
<th>Contact Name</th>
<th>Phone Number</th>
<th>Email</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>America Red Cross</td>
<td>Bill FitzGerald (Senior Advisor)</td>
<td>202.303.5692 / 703.675.8182</td>
<td><a href="mailto:William.FitzGerald@redcross.org">William.FitzGerald@redcross.org</a></td>
<td>2720 Prosperity Avenue, Suite 200, Fairfax, VA 22031</td>
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<tr>
<td></td>
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<td>919-760-6679 / 704-609-0354</td>
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<td>4737 University Drive, Durham, NC 27707</td>
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<tr>
<td>Rex Health in Raleigh NC</td>
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<td>919-784-3058</td>
<td><a href="mailto:timothy.carter@unchealth.unc.edu">timothy.carter@unchealth.unc.edu</a></td>
<td>4420 Lake Boone Trail, Raleigh, NC 27607</td>
</tr>
<tr>
<td></td>
<td>Judy Allen (Transfusion Services)</td>
<td>919-784-2192</td>
<td><a href="mailto:judith.allen@unchealth.unc.edu">judith.allen@unchealth.unc.edu</a></td>
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<tr>
<td></td>
<td>Darlene Kimball (Lab Team Leader)</td>
<td>919-784-4761</td>
<td><a href="mailto:darlene.kimball@unchealth.unc.edu">darlene.kimball@unchealth.unc.edu</a></td>
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<tr>
<td></td>
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<tr>
<td>Marsh Regional Blood Center</td>
<td>Ray Bell (Donor Operations Manager)</td>
<td>423-408-7500</td>
<td>N/A</td>
<td>280 VA Ave NE, Suite 100, Norton, VA 24273</td>
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<tr>
<td></td>
<td>Don Campbell (Director)</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td></td>
<td>Debra Wampler (SWVA Donor Recruiter)</td>
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<td><a href="mailto:Debra.Wampler@Wellmont.org">Debra.Wampler@Wellmont.org</a></td>
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<tr>
<td>Inova Blood Bank Services</td>
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<td></td>
<td>Terri Craddock</td>
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<td>N/A</td>
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<tr>
<td>Blood Assurance</td>
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<td><a href="mailto:eec@bloodassurance.org">eec@bloodassurance.org</a></td>
<td>705 E 4th Street, Chattanooga, TN 37403</td>
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<td></td>
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<tr>
<td>Virginia Blood Services</td>
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<td>804-213-4115 / 804-387-8495</td>
<td><a href="mailto:csheppard@vablood.org">csheppard@vablood.org</a></td>
<td>N/A</td>
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In Virginia, the places where the Zika virus (ZIKV) is likely to take hold and be spread by local mosquitoes among the human population are found in the most heavily populated jurisdictions. The most important factors that contribute to Zika virus transmission are a combination of (1) Distribution and density of Ae. Aegypti mosquitoes (the importance of Ae.albopictus in widespread transmission is expected to be less); (2) Density of human population; (3) Likelihood of frequent case introduction from Zika-epidemic or –endemic countries. That is because the virus transmission cycle requires a concentrated mixture of people and mosquitoes to maintain a human-to-mosquito-to-human transmission cycle. Areas where human population density is high (house lot sizes may be small) and where homes may be in poor repair, may allow the virus to move more easily between people and mosquitoes.

Some geographic locations may be at higher risk for Zika transmission because of typical travel patterns (tourism, business, immigration, foreign visitors) of residents.
Fortunately, some of Virginia’s most heavily populated jurisdictions have established mosquito surveillance and control programs and may be able to respond to a detected outbreak by concentrating prevention efforts in affected neighborhoods. However, there are many smaller jurisdictions in Virginia with no mosquito control capability that may have neighborhoods that have potential to become Zika transmission zones.

As with the dengue virus (DENV) and the chikungunya virus (CHIKV), the prevention or reduction of transmission of ZIKV is completely dependent on limiting person-mosquito contact and the control of mosquito vectors. Mosquito surveillance is a key component of any local integrated vector management program. The goal of mosquito-based surveillance is to quantify human risk by determining local vector presence and abundance.

Figure 5. Estimated Range of Aedes albopictus and Aedes aegypti in the United States, 2016

I. The Vector Mosquitoes

The only known mosquito species in Virginia known to be capable of Zika transmission are the Asian tiger mosquito (*Aedes albopictus*) and the yellow fever mosquito (*Aedes aegypti*). These mosquitoes both have the same flight and biting behavior and both rely almost exclusively on artificial containers of water as their egg laying habitats. *Aedes aegypti* mosquitoes tend to feed almost exclusively on people and this makes them very efficient at transmitting ZIKV, DENV and CHIKV from person to person. *Aedes albopictus* frequently bite people, but they also like to feed on animals such as dogs and cats, so although they are perfectly capable of becoming infected with and transmitting these viruses, they are less efficient at doing so because many of their blood meals come from animals that are not known to serve as reservoirs for the viruses.

*Aedes albopictus* are the most common nuisance mosquito in Virginia and are present and common in every jurisdiction in the state (see Figure 4 above). Although small, isolated populations of *Aedes aegypti* are occasionally discovered in Virginia, they are so uncommon as to be an insignificant risk factor as vectors. Therefore, most mosquito surveillance and control efforts will be targeted on *Aedes albopictus*, and if any *Aedes aegypti* happen to be present, they will be readily detected and controlled by this same effort.

II. Prevention and Control of Zika, Dengue and Chikungunya Virus Transmission

The principal functions of ZIKV mosquito-based surveillance programs are to:

- Determine which neighborhoods might be likely places for ZIKV transmission
- Monitor for the presence of *Aedes albopictus* in target neighborhoods and identify geographic areas of high mosquito abundance (high-risk) within the neighborhoods
- Identify which container habitats or properties are producing the most mosquitoes
- Identify and map larval sites that cannot be accessed or eliminated.
- Monitor mosquito populations to gauge the effectiveness of vector control efforts
- Test collected mosquitoes to monitor for ZIKV infection rates during outbreaks to:
  - identify primary/secondary mosquito vectors
  - establish thresholds at which humans get infected

The risk of arbovirus transmission varies regionally and local surveillance and control capabilities may vary considerably among jurisdictions (e.g., number of trained personnel and resources available, etc.). Furthermore, even the jurisdictions with the greatest mosquito surveillance and control capabilities in Virginia do not have the resources needed to perform mosquito control across the entire jurisdiction. Therefore, the most efficient use of mosquito surveillance and control resources should focus efforts on neighborhoods that are most likely to have imported human ZIKV infections, and/or on neighborhoods where persons with identified infections reside, who are more likely to be a source for local mosquito-borne transmission.

Whereas mosquito-based surveillance is the preferred method for monitoring or predicting West Nile virus outbreaks, it is not the preferred method for monitoring or predicting ZIKV, DENV and CHIKV outbreaks. For these arboviruses, it is more efficient to detect infections in people and focus surveillance and control efforts around the identified patients. In the United States,
dengue, chikungunya, and Zika virus disease are nationally notifiable conditions and healthcare providers are required to report any confirmed or suspect cases to local and state health departments. In turn, health departments should immediately notify state and local mosquito control authorities about human cases that passed at least a portion of their viremic phase of illness locally. Timely identification and response to mosquito-borne disease outbreaks of Zika, dengue, and chikungunya requires constant communication between healthcare providers, local and state public health departments, and mosquito control specialists.

Ideally, effective vector-based Zika prevention involves initiating control measures such as source reduction (container habitat elimination) and larvicide treatments before the beginning of the mosquito season, and measures to reduce the population of adult mosquitoes, such as adulticide treatments, following identification of potentially viremic patients in places where the mosquito populations are significant. However, in jurisdictions where locally-acquired outbreaks are detected, a more concerted combination of containment and large-scale vector control may be needed to minimize vector-human contact. In addition to routine educational campaigns focused on key prevention messages, source reduction and enhanced public education campaigns may be initiated in jurisdictions that do not have established or sufficient mosquito surveillance and control capabilities, when probable or confirmed when infections are detected.

III. Mosquito Surveillance and Control Response to Identified Zika Cases in Virginia

This section of the plan provides a tiered approach to public health mosquito surveillance and control activities with the goals of being responsive to the needs of the residents of Virginia, and preventing the spread of Zika virus infection by providing a reasonable, practical, justifiable, and consistent approach to mosquito surveillance/control activities across the Commonwealth.

The overarching principle of controlling Zika virus disease is for persons with Zika virus circulating in their blood (viremia) to avoid mosquito bites and those with Zika virus in their semen or vaginal fluids to avoid unprotected sex. Because persons can be unaware of the presence of the Zika virus in their body, wide dissemination of disease prevention messages is important during the mosquito season and throughout the outbreak of Zika virus disease in the Americas. Public education and personal responsibility for mosquito bite prevention and other personal protection measures are key to Zika control. VDH staff responsible for implementing these activities must mindfully adhere to applicable confidentiality laws and policies.

Planning Assumptions:

Travel-associated and sexually transmitted Zika virus infections will continue to occur. Local summer transmission may occur in limited areas of the continental United States (CONUS) and Hawaii where competent vectors exist.

- Because of the risk of transmission of Zika virus infection through blood transfusions, blood safety interventions are needed for both unaffected and affected areas. With the recent outbreaks in the Americas, the number of Zika virus infections among travelers visiting or returning to the US is likely to increase.
- Local transmission of Zika virus in US territories and affiliated Pacific Island countries is ongoing.
- Neither vaccines nor proven clinical treatments are expected to be available to treat or prevent Zika virus infections before local transmission begins within CONUS or Hawaii.
- The efficacy of vector control in reducing mosquito-borne infection risks may be limited, as has been the case with similar mosquito-borne viruses, such as dengue and chikungunya.

**Definitions:**

- **Targeted mosquito surveillance:** Mosquito surveillance activities at or as close as possible (within 150-200 meters of an applicable Zika patient’s home or other physical location that has been determined as a site of likely mosquito exposure) as described below. Mosquito surveillance activities may include any or all of the following: property and neighborhood inspection for mosquito habitats; eliminating these habitats when possible (i.e., dumping containers); trapping mosquitoes for speciation and arboviral mosquito testing (when available); and dissemination of educational materials (as appropriate for the type of housing and areas where containers may be found).
- **Targeted mosquito control:** Mosquito control activities at or as close as possible (within 150-200 meters of an applicable Zika patient’s home or other physical location that has been determined as a site of likely mosquito exposure) as described below. Control activities may include larval and/or adult mosquito control methods as needed and as available.
- **Routine mosquito surveillance/control:** Mosquito surveillance activities are already conducted in some jurisdictions in Virginia and these routine activities are not based on the presence of an identified human case of Zika virus disease.

**A. DETERMINATION OF NEED FOR TARGETED MOSQUITO SURVEILLANCE AND CONTROL ACTIVITIES AROUND A PERSON’S HOME:**

**Criteria For Initiating Targeted Mosquito Surveillance and Control Activities:**

Whether targeted mosquito surveillance and control is needed in response to an identified case of Zika virus infection will depend on a number of criteria; there will be different levels of urgency with respect to the case status of the patient. The following factors should be considered when determining whether mosquito surveillance and control activities are needed.

a. **Are Asian tiger mosquitoes** (*Aedes albopictus*) currently active in Virginia (in unusually warm years the *Ae. albopictus* season may run from May 1st to October 30th)?

b. **Was the Zika patient potentially viremic while in Virginia during the mosquito season?**

c. **Did the health department receive the report of the viremic or potentially viremic patient within 45 days of the patient’s estimated viremic period?**

d. **Did the patient acquire the Zika infection elsewhere, or while in Virginia?** (This will help prioritize activities if needed)

These are the current guiding principles for determining whether targeted mosquito surveillance and control activities are needed, it is expected that there will be case-by-case exceptions to the
rule. Local health districts are encouraged to contact the Office of Epidemiology to consult on particular cases of interest. If local transmission is documented in Virginia, targeted activities may be initiated for a wider population than outlined below.

1. Targeted mosquito surveillance and/or control is recommended for:

   a. **Viremic Patients:** A person who presents with one or more of clinically compatible symptoms of Zika virus disease AND a PCR positive Zika lab result.

   b. **Patients who are/were potentially viremic while in Virginia:** A symptomatic person who is in Virginia anytime during their first seven days of illness who meets any of the following criteria:
      - Three or more symptoms in absence of an available lab result (e.g., lab results pending)
      - Three or more clinically compatible symptoms AND a presumptive Zika positive IgM result
      - A person with an infection that meets the probable or confirmed Zika virus disease case definition, with prioritization for locally-acquired infection.

Patients meeting these criteria should be considered as having the potential to infect local mosquitoes. **As resources permit, targeted mosquito surveillance activities are recommended around homes and other properties where individuals spent a considerable amount of time while viremic and had mosquito exposure.**

**Targeted mosquito control activities may be conducted if necessary and resources permit.** Control activities will be determined as “necessary” based on findings during mosquito surveillance as described later in this document.

2. Targeted mosquito surveillance and/or control should be considered for:

   a. **Asymptomatic persons with positive lab results:** Targeted mosquito surveillance may be considered on a case-by-case basis for asymptomatic persons with positive lab results. These individuals are considered to be potentially viremic for mosquito surveillance purposes. Based on information gathered through surveillance efforts, mosquito control measures may also be deemed necessary.

3. **Targeted mosquito control is NOT routinely recommended for:**

   a. **Patients who were not viremic while in Virginia:** Persons who have an onset of illness a week (seven days) or more prior to their return to Virginia should not be a significant threat for passing the virus on to local mosquitoes. No mosquito surveillance and control response is necessary around the homes of these patients. Local and state mosquito surveillance programs may find it useful, however, to map the location of such an imported case, in case of further events such as sexual transmission and to document whether travel related cases are concentrated in certain geographic areas.
B. IMPLEMENTATION OF TARGETED MOSQUITO SURVEILLANCE AND CONTROL ACTIVITIES:

If resources are limited, localities should prioritize targeted surveillance and control activities for those cases meeting criteria as described in Section III.A.1, and III.A.2, above and those cases that are highly suspected or confirmed to be locally acquired. As resources permit, localities should conduct larval and adult mosquito control activities around homes or other areas where individuals spend a considerable amount of time and have mosquito exposure of viremic or potentially viremic patients as recommended below.

NOTE: It is important to remember that targeted adult mosquito control efforts to knock down the adult mosquito population in the environment, will be short lived in the absence of consistent and regular elimination, dumping or treating of mosquito habitats within the treated environment

1. Guidance for Larval and Adult Mosquito Control Activities:

a. **Available Resources:** In localities where there are no existing mosquito surveillance programs, Office of Epidemiology-Division of Environmental Epidemiology (DEE) Mosquito Surveillance personnel will be deployed to conduct targeted mosquito surveillance activities for applicable case patients, as resources and time permit. If surveillance activities at the patient’s home or other physical location of interest indicate that there are no significant mosquito populations, there will be no recommendation for any mosquito control action, but the patient should be advised to avoid mosquitoes in other locations. If surveillance shows that there is a significant mosquito population on the patient’s property (i.e., > 25 mosquitoes per BG Trap set for 24 hours, or five or more mosquitoes seen hovering around surveillance personnel during the site visit, there will be a recommendation that mosquito control is needed. In addition, the state of Virginia has established a contract with Clarke Mosquito and Mosquito Authority to be utilized by the localities for mosquito surveillance and control activities throughout the state. Further, Clarke Mosquito has the capability to utilize aerial spraying, if determined necessary.

b. **Size of Area to be Surveyed and/or Treated:** The recommended mosquito control response for ZIKV is to focus surveillance and control efforts in a 150 meter to 200 meter (approx. 500 to 650 foot) radius around the residence of a home or other physical location of interest in which an identified patient resides, works, etc. However, in the case of a traveler with an onset of symptoms within the previous week, larval mosquito control can be limited to the patient’s property and if recommended, adult mosquito control in the form of a “barrier treatment” could also be limited to the patient’s property. Otherwise, if the patient had been bitten by mosquitoes and several weeks had elapsed between when the patient became viremic and when the surveillance revealed a need for mosquito control, it is recommended that the treatment area be expanded to the 150 or 200 meter radius. This would mean that surveillance or control personnel should request access to all properties within the proposed radius and where access was granted, the control actions would be to recommend and support where possible the elimination, dumping or treatment of every accessible container habitat within that radius, followed by adult mosquito control within the same radius. Localities may consider widening this treatment range if the 150-200 meter area does not put a mosquito surveillance effort
outside a range that would reasonably protect the patient’s anonymity. Judgment will need to be applied here and the Office of Epidemiology will be available to consult on these situations as needed.

c. **Larval Mosquito Control:** Mosquito surveillance personnel should always conduct larval control while inspecting a property; surveillance personnel can recommend the dumping of containers of water found on the property of interest during the inspection/surveillance effort. When possible, mosquito surveillance personnel should speak to the homeowner or other household members and point out any containers that should be discarded, stored in a dry place, dumped on a weekly basis, or regularly treated with larvicides. It is important to note that the application of larvicides on a homeowner’s property can only be done by surveillance personnel who are trained and certified/licensed for mosquito control. The VDH-DEE personnel (or other local health department staff) designated to do surveillance on patient properties will not be trained and certified pesticide applicators. However, as homeowners can legally treat habitats on their own property with over-the-counter larvicide products available to the public, VDH-DEE surveillance personnel may be carrying consumer packages of larvicides that they can give to the homeowner to use in treating their own property. For example, if the homeowner has an untreated swimming pool that is breeding mosquitoes, the homeowner could be given a six pack of larvicide dunks and recommended to treat the pool with one dunk for every 100 square feet of water surface, once every month.

d. **Adult Mosquito Control:** Adult mosquito control is accomplished by the spraying of insecticide fogs (aerosols) that kill the mosquitoes that fly through it, or by spraying a residual layer of insecticide called a “barrier treatment” on the foliage of bushes, shrubs, and ivy that the mosquitoes rest on. Aerosol treatments do not leave any residual layer of insecticide in the treated area and only kill the mosquitoes that are flying in the area at the time of the treatment. Aerosol treatments can be made at close range with portable (backpack) aerosol generators/foggers, or from up to a hundred feet away by use of truck mounted foggers; close range treatments are always more effective. Barrier treatments are applied by the use of powered backpack sprayers that generate droplet sizes that are large enough to stick to surfaces, and will kill any mosquitoes or other insects (including beneficial insects and pollinators) that sit on that foliage for a period of up to three or four weeks after treatment, depending on rainfall; barrier treatments are very useful around places where container habitats cannot be eliminated. Aerial treatments can also be applied to defined geographic areas but delivery should be based on local assessment of spatial risk.

2. **Determining the Need for Adult Mosquito Control:**

The need for adult mosquito control is determined by the size of the local Asian tiger mosquito population on the property. This can be estimated by several methods including:

a. Surveillance personnel can look for mosquitoes flying around them while conducting a property inspection; although there is no set standard for what number of observed mosquitoes constitutes a large population, one method of estimation is that if five or more
adult Asian tiger mosquitoes are observed flying around surveillance personnel during the inspection, adult mosquito control is warranted.

b. If a BG Sentinel Trap baited with BG lure and CO2 is set over a 24 hour trap period and collects more than 25 Asian tiger mosquitoes, adult mosquito control is warranted.

3. The Method of Adult Mosquito Control:

The adult mosquito control method is determined by whether or not one can easily eliminate the local larval mosquito habitats.

a. If the larval habitats that supply most of the local adult mosquito population can be found and eliminated, it may only be necessary to control the adult mosquito population with an aerosol treatment.

b. If the local adult mosquito population is large and originates primarily from larval habitats that cannot be accessed or eliminated by mosquito control personnel, barrier treatments can be used on the patient’s property, or on other neighborhood properties adjoining or surrounding the untreated larval habitat(s).

Other best practices include implementing targeted educational and surveillance activities across a large enough area so as to not inadvertently identify the address of a suspected/confirmed case-patient.

Control of adult Asian tiger mosquitoes by use of truck mounted foggers may provide a certain amount of anonymity to a patient because no specific property is targeted, however, adult mosquito control by truck mounted equipment is more difficult to achieve and requires different actions and insecticides than are used for other mosquito species.

Truck mounted treatment for Asian tiger mosquito control requires the following specific actions:

a. Treatment should be done within the hour immediately following sundown, or at night;

b. The aerosol generating nozzle should be aimed horizontally;

c. All streets and alleyways in the neighborhood should be used to minimize the distance between the aerosol generator and the target properties and to maximize aerosol coverage;

d. An insecticide with a flushing agent should be used to stimulate resting mosquitoes into flight (there is a water based aerosol insecticide called “Duet” that contains flushing agent [Prallethrin + Pyperonyl Butoxide] that has been used for Asian tiger mosquito control with varying degrees of success; and

e. Several treatments spaced several nights apart may be needed to achieve a significant reduction of the mosquito population.

4. Recommendations for Sharing Information with Mosquito Surveillance and Control:

In many jurisdictions that have mosquito control programs, it is quite normal for mosquito control personnel to be invited to inspect private residential properties for mosquito populations or “mosquito breeding habitats” and for these personnel to dump or treat any aquatic breeding
habitats they encounter. Therefore, mosquito surveillance and larval control may not arouse the suspicions of neighbors. Conversely, it is not common for public mosquito control personnel to conduct adult mosquito control activities on private property. Furthermore, adult mosquito control activities typically require the use of powered backpack, aerosol generating equipment that could attract the attention of neighbors. Therefore, if inspection activities identify adult mosquito populations that are worthy of concern around a patient’s home, adult mosquito control activities at that location could potentially lead to a patient’s confidentiality being compromised.

a. **Patient confidentiality issues that determine if mosquito surveillance and control can be conducted around a patient’s home:** Due to the legal requirement to protect patient anonymity, any targeted mosquito surveillance and control activities being conducted on or around a suspected patient’s home or workplace should be implemented in a fashion that preserves the anonymity of the patient.

b. **Obtaining patient permission to share address information with mosquito surveillance and control:** Local health departments should obtain patient authorization prior to sharing address (or other identifying) information to any local mosquito control program. If a patient qualifies for targeted mosquito surveillance and control due to having a viremic period in Virginia, Local Health Department 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 health department representative should also request permission to share the address of the patient and/or patient contact information with local mosquito surveillance/control personnel. In districts with a mosquito control program, if the patient does authorize disclosure of his/her address it should be shared directly with the mosquito control manager, not other employees. In districts without a mosquito control program, disclosure of his/her address should be shared directly with the local health department person designated to inspect/survey patient’s properties for the presence of Asian tiger mosquitoes. Additionally, whether or not a local health department person has been designated for this purpose, the patient’s address should be shared with points of contact in VDH-DEE so that if needed, their roving mosquito surveillance team can visit and survey the property.

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 mosquito control 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 Office of the Attorney General. Local health departments should contact the Office of Epidemiology-DEE for further guidance in such situations. Local health departments 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.
5. Conducting Adult Mosquito Control on Patient’s Property

If permission for adult mosquito control on the patient’s property is granted, the following options may be taken depending on the origin and severity of the adult mosquito population:

1. If the mosquito population appears to have originated primarily from container habitats on the patient’s property, adult mosquito control could be accomplished either by an aerosol treatment, or a residual “barrier treatment” either of which can be applied with powered backpack applicators. The container habitats on the property should all be dumped, eliminated or treated too.

2. If the mosquito population also appears to originate from adjoining properties, a barrier treatment should be applied to foliage (e.g., ivy, shrubs, bushes or hedges) around the patient’s property and mosquito personnel should inspect other properties on the block for the breeding habitat of the mosquitoes and take action or give advice as necessary to eliminate breeding habitats.

IV. Mosquito Surveillance and Control Recommendations by Transmission Risk Category

<table>
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<tr>
<td>Suspected / Confirmed Incident</td>
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<td>Confirmed Multiperson Local Transmission – Zika virus illnesses with onsets occurring ≥ 2 weeks apart but within an approximately 1 mile (1.5 km) diameter</td>
</tr>
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**PRE-INACCIDENT | PHASE 0 - Preparedness:**

The goal for this phase is to reduce the threat when mosquito season begins and to be ready to effectively and rapidly respond to each level of threat.

In preparation for possible local implementation of Zika mosquito control activities, health districts should engage with local governments and community organizations to establish communication networks, plan for public communication, and identify resources and expertise for vector inspection, surveillance, and control services. Public communication includes messages on personal protection, elimination of *Aedes* mosquito breeding sites, and campaigns to motivate residents to remove and dispose of water-holding containers.
It is recommended that each health district identify personnel or community partners who can be or are already trained and available to conduct on-site mosquito inspections, look for potential mosquito breeding grounds or the presence of daytime flying mosquitoes and make recommendations, and establish a process for ensuring availability of these services. Resources for mosquito surveillance and control may be identified among health district personnel or local mosquito control organizations within a neighboring jurisdiction. Mosquito surveillance personnel can also be requested from the VDH Division of Environmental Epidemiology (DEE) in Richmond.

The following basic critical activities should be undertaken, ideally, before the seasonal appearance of vector mosquitoes to increase readiness to prevent or limit possible Zika virus transmission.

- Efforts to survey for and eliminate mosquito habitats before the mosquito season (beginning May 1) are always advisable, but may only be possible in jurisdictions that have ample mosquito surveillance and control resources. However, if local transmission has been detected in a neighborhood the previous season, it would be advisable if local resources and personnel can be made available to inspect the affected community and eliminate or minimize the presence of larval habitats before the mosquito season.
- Public health officials and vector control officials should develop a communications network to ensure timely exchange of information, and collaboratively share information to guide optimum vector control efforts.
- Develop and begin to conduct public mosquito education campaigns focusing on (1) personal protection measures; (2) how citizens can reduce or eliminate larval habitats for *Ae. albopictus*; and (3) motivating the community to cover, dump, remove, or treat any water-holding containers or to treat them with larvicides.
- Local and state responding officials should review existing staffing capacity, resource allocation, and technical expertise at the local level for vector control and consider use of intergovernmental agreements for vector control to help adjacent counties outside their jurisdiction, as well as pre-positioning contracts with vendors to supply additional capacity.
- Conduct surveys to determine abundance, distribution, and type of containers; large accumulations of containers (e.g. tire piles), or large containers (e.g., flooded boats, neglected swimming pools, etc.) that could result in locally high mosquito abundance. Determine if there are any local laws available that will allow the jurisdiction to remove or treat significant container habitats on private property.
- If resources exist, develop procedures for the systematic collection and analysis of vector distribution and insecticide sensitivity data.
- Initiate a community-wide source reduction campaign – the goal of the campaign is to motivate the community to remove and dispose of any water holding containers.

**PRE-INCIDENT | PHASE 0/1 – Preparedness/Mosquito season:** *Aedes aegypti* or *Aedes albopictus* mosquito biting activity. Introduced travel-related or sexually transmitted cases.

The goals for these phases include:
• Establishing an action plan including procedures for rapid communication of information regarding potential local transmission to vector control partners; procedures for collection and analysis of vector distribution and insecticide resistance testing (see CDC methods); and developing vector response plans.

• Identifying locations at potential higher risk (all areas with a history of competent vectors are at risk); population centers in these areas at are more risk than rural areas because of more suitable vector habitat, greater housing density, and potential for more international travelers. reducing the general risk of transmission in the most vulnerable areas by preemptively reducing vector populations and initiating precautionary vector control measures within a minimum of 150 meters of introduced cases (i.e., residents with suspected or confirmed symptomatic Zika virus infection acquired through travel or sexual contact). NOTE: Areas with only \textit{Ae. albopictus} populations at very low density may elect not to conduct vector control around introduced cases, due to lower likelihood of transmission.

• Establishing communication plans with existing mosquito control resources including identification of mosquito control partners who can respond to transmission events quickly, assurance of arboviral mosquito testing at DCLS, and assessing the readiness and competencies of vector control partners in the areas of highest risk. During Phase 1, VDH and its partners will continue to survey and monitor vector populations, establish partnerships to conduct insecticide resistance testing, engage communities through public communication campaigns, and will initiate vector control in a targeted manner as described above.

**SUSPECTED/CONFIRMED INCIDENT | PHASE 2 – Confirmed Local Transmission:** Single locally acquired case, cases clustered in a single household, or cases resulting from a common exposure source.

Once non-travel or non-sexually transmitted cases are identified, local transmission is presumed, and the purpose of vector control is to prevent transmission from expanding to unaffected areas and to break transmission where it exists. The basic elements of response for Phases 2 are the same as for Phase 1 for travel cases, but as the extent of transmission increases, the intensity of intervention and scale of resources committed should increase. Further, cases suspected to be locally acquired during Phase 2 should be prioritized.

**The actions recommended below are to be implemented during both Phase 1 and Phase 2,** for those patients who meet the definition of viremic/potentially viremic patient, and for whom other factors have been considered (e.g., exposure to mosquitoes).

• **Provide 1:1 education:**
  o At the time a physician requests Zika virus testing, public health should ask the clinician to relay the prevention messages to the patient. The majority of patients tested will not have the disease, but the opportunity to make the most difference in terms of disease prevention for symptomatic and/or viremic patients is at the time of testing. Ensure that health care providers have access to appropriate educational materials and messages to give to persons with suspected/confirmed Zika virus disease.
Education should also be provided when a patient tests positive. The health department can call the physician to determine which party will contact the patient to relay the prevention messages over the phone.

The focus of the education to the case-patient is on personal protection to avoid mosquitoes and strategies to eliminate mosquito habitats around the household or other area where he or she spends time outside and could be bitten by mosquitoes.

Prevention messages include: the need to avoid mosquito bites; recommendations for personal protection (e.g., insect repellent, proper clothing, window and door screens to prevent mosquitoes from entering the home, or use of air conditioning and staying indoors); and recommendations to eliminate mosquito habitats where a person lives.

- **Actively Engage Community through Public Education Campaigns**:
  - Continue public education campaigns focusing on avoiding mosquito bites and reducing or eliminating larval habitats for *Ae. albopictus*.
  - Include public service announcements and partnerships with local governments, non-profit organizations and schools.

- **Conduct targeted mosquito surveillance to assess vector status in vicinity of the case. This includes**:
  - With patient authorization, conduct home visit to provide 1:1 education and to inspect the property for the presence of daytime-flying mosquitoes and potential mosquito habitats.

Home visits may be conducted by a local environmental health representative, MRC volunteer, or another person who is able to differentiate mosquitoes from other types of flying insects and what container habitats to look for. Trained mosquito surveillance personnel from a jurisdiction with a mosquito control program or VDH mosquito surveillance personnel may also conduct home visits. It might be effective for public health staff representing environmental health plus one representing nursing or epidemiology to go on-site to conduct the environmental assessment and reiterate the personal protection advice, respectively.

- Conduct mosquito surveillance activities (adult sampling). Please contact either local mosquito surveillance and control program or the OEpi-Division of Environmental Epidemiology to request assistance. Sharing information with mosquito surveillance personnel requires authorization of the patient as described elsewhere in this document. The purpose of these activities is to:
  - Estimate, identify or confirm areas of high adult mosquito abundance
  - Determine distribution of vector mosquitoes and insecticide sensitivity to the extent possible
  - Evaluate the efficacy of source reduction and larvicide treatments
  - Also consider performing systematic searches for immature mosquito or larval stages.
Mosquito surveillance includes trapping and mosquito identification (and arboviral testing, if available) on property and surrounding area as resources permit. If there does not appear to be many* Asian tiger mosquitoes in the area around the patient’s home, there is no need to expand out to a 150-meter radius. Conversely, if there are mosquitoes around the patient’s home, it is recommended to work outwards toward that 150-meter radius to find and try to eliminate all the sources of the mosquitoes.

- Surveillance personnel should identify potential mosquito habitats around the home or other locations of known common exposure (e.g., friend’s home or other site where patient was bitten).
- Targeted surveillance and control activities involving home visits should be closely coordinated with concurrent educational efforts and messaging.
- *There is no set standard for what number of observed mosquitoes constitutes a “large” population; one method of estimation is whether five or more adult Asian tiger mosquitoes are observed flying around mosquito surveillance personnel during the inspection or whether 25 or more tiger mosquitoes were collected in a BG trap baited with BG lure and CO2 that was set for 24 hours.

- If resources allow and the situation supports it, consider mosquito control: If on inspection adult Asian tiger mosquito populations are present around the patient’s home, an effort should be made to identify and eliminate any container breeding habitats on the property. If the patient has been bitten by mosquitoes around the home (or other property) while symptomatic, it is recommended that adult mosquito control be considered at that location as well as an effort made to eliminate container habitats. In addition, staff may:
  - Continue/maintain community source reduction efforts.
  - 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.
  - During Phase 2, particularly for locally acquired cases, if there are mosquitoes around the patient’s property and the patient may have contracted the virus from these mosquitoes, or was subsequently exposed to these mosquitoes while viremic, adult mosquito control should be strongly considered around the patient’s home. If mosquito surveillance findings indicate that Asian tiger mosquitoes are present in a wider area than the patient’s property, an extension of adult mosquito control out to the 150-meter radius may also be considered if resources permit.

**INCIDENT/RESPONSE | PHASE 3: CONFIRMED MULTIPERSON LOCAL TRANSMISSION:**

Two or more cases are reported within a definable area/community OR in different jurisdictions with onsets occurring ≥ 2 weeks apart. Affected individuals did not travel, did not have a sexual partner who traveled, and are not known to have attended a common event.

Many elements of response for Phases 3 and 4 are the same as for Phase 2, but as the extent of transmission increases, the intensity of intervention and scale of resources committed should increase. At wider transmission, some methods not practicable for small foci might be
All of the above activities are recommended as previously described, plus:

- **Virginia’s Unified Command Structure would be engaged** to provide coordination of statewide response efforts and the identification of supplementary resources for jurisdictions as needed.

- **Vector control efforts should align with state and local government decisions** regarding boundaries for declaring a site a “Zika affected area”. (This may model county/city lines, be a zip code designation, or smaller area such as a neighborhood.) State and local officials will also need to consider whether the area needs to be designated as a “Travel guidance area”.
  - As resources allow, local and state officials should plan to consider intensifying and expanding vector control efforts within the areas of active transmission.

- **When recommended and feasible,**
  - Divide the outbreak area into operational management areas where control measures can be effectively applied to all private properties within a few days; repeat as needed to reduce mosquito density
  - Conduct door-to-door [property to property] inspections and mosquito control in an area-wide fashion (reach >90% coverage of the control area within a week).

- **Provide education:**
  - In addition to 1:1 education of case patients, targeted community-level educational campaigns should be considered to ensure awareness of the importance of mosquito bite prevention and source reduction.
  - Mosquito control personnel and/or local health department teams should distribute educational literature at the homes and neighborhoods they visit, as appropriate for the type of housing and potential for the presence of containers that may serve as mosquito habitats.

- **Conduct home visits**
  - Inspect the properties for potential mosquito habitats and the presence of flying mosquitoes.
  - Perform systematic searches for immature mosquito or larval stages.

- **Conduct mosquito surveillance:**
  - If available, conduct trapping and mosquito identification and arboviral testing on property and surrounding area to a 150-meter radius around each home or other relevant sites of exposures (if possible) of cases as resources permit.
  - Initiate/maintain sampling by trapping with BG traps to estimate adult mosquito abundance and evaluate effectiveness of insecticide treatments by comparison of trap counts from pre and post-treatment trapping.

- **Conduct mosquito control:**
If mosquito populations are present around the patients’ homes or other relevant sites of interest, use backpack aerosol generators to apply spatial and/or residual adulticide (adult mosquito control) treatments to reduce vector abundance in shrubs, ivy, and hedgerows within 150–200 meters around the home of any persons with suspect or confirmed infections to the extent that such resources can be made available. Ariel spraying can be considered based on local assessment of spatial risk.

Expansion of mosquito surveillance and control to the surrounding neighborhood area may be warranted in this situation, and consideration of this step and definition of the target area will be on a case by case basis (may depend on the layout of the neighborhood). Water-holding containers that cannot be dumped, covered, discarded or otherwise modified should be treated with long-lasting larvicide dunks or briquets.

The duration of control activities should be no less than 45 days after the date of onset of the last known case (the time it is possible for an Aedes feeding on that person to continue to transmit Zika virus). As a precaution, the affected jurisdiction might choose to continue moderate surveillance and control efforts where indicated, beyond the 45-day buffer or until the end of mosquito season.

- **Continue community outreach**
  - Organize area/community clean-up campaigns targeting disposable containers (source reduction), including large junk objects that accumulate water (junk cars or boats, broken washing machines, refrigerators, toilets) in buildings, public areas, etc.
  - If funding allows, host a community volunteer / waste disposal program to help facilitate removal of larval habitats.

**V. Trapping and Surveillance Methods for Aedes aegypti and Aedes albopictus**

**Ovitraps**

Ovitraps are small metal, glass or plastic containers, usually dark in color, containing water and a substrate (wood, seed germination paper, cloth, plant gel) where female mosquitoes lay their eggs. Ovitraps can be used to detect the presence of gravid *Ae. aegypti, Ae. albopictus* and a wide variety of other gravid females of container-breeding *Aedes* mosquito species (Fay and Eliason 1966, Mackay et al. 2013, Reiter et al., 1991). Ovitraps take advantage of the fact that gravid *Ae. aegypti* and *Ae. albopictus* females lay their eggs in artificial containers. Adequate sampling requires regular (weekly) trapping at fixed sites, representative of the habitat types, present in the community. Ovitraps should not be deployed in the field for more than a week at a time because they could become larval sites and may begin producing adult mosquitoes; however, some ovitraps are specifically designed not to produce mosquitoes (Chan et al. 1977; Barrera et al. 2013).

Ovitraps have several advantages, including being inexpensive, easily deployed, and not invasive (they can be placed outside of houses, not requiring entry into homes). A small number of
ovitraps is usually enough to determine vector presence; less than 100 ovitraps can reliably estimate abundance in a large urban neighborhood (Mogi et al., 1990). Typically, one ovitrap is placed per city block. Lastly, ovitrap data is easy to analyze; it is usually expressed as the percentage of positive ovitraps (ovitraps with eggs). The mean number of eggs per ovitrap can be used to estimate adult mosquito abundance.

Interpreting ovitrap data may require caution, because ovitraps compete with naturally occurring larval habitats and the estimates from oviposition surveys may not accurately reflect the abundance of gravid females under some conditions. For example, oviposition indices may be skewed after source reduction campaigns when gravid females find fewer suitable habitats and lay larger proportions of eggs in the ovitraps confounding the evaluation of control efforts (Focks 2003). Some degree of training in microscopy may be needed for accurate egg counting especially when there is debris on the oviposition surfaces. Lastly, the collected eggs need to be hatched and reared out in the laboratory and the larvae or adults identified to species, which requires trained personnel.

Im mature stage (larvae and pupae) surveys

Because of a wide variety in type, size and shapes of water-holding containers, there is no standard equipment for sampling the immature stages of container breeding mosquitoes. If the container is large enough, such as a 55 gallon barrel, a dipper or net may be used. However, the common containers are small cans, tires etc., and usually the entire contents are emptied onto a tray or a pan and the immature stages picked out using a dropper. The immature stages are usually reared out in the lab and identified to species.

Adult mosquito trapping

*Ae. aegypti* and *Ae. albopictus* are not efficiently captured by the most commonly used mosquito traps, such as the CDC miniature light trap, or CDC gravid trap. Currently the most commonly used adult traps for *Ae. aegypti* and *Ae. albopictus* are BG Sentinel Traps, and a variety of gravid traps such the CDC-Autocidal Gravid Ovitrap (CDC-AGO) (Mackay et al. 2013, Barrera et al. 2014a, b).

**The BG Sentinel Trap:** The BG Sentinel Traps use a combination of attractive visual and olfactory cues. They have the advantage of being collapsible and light. BG-Sentinel traps are more effective in capturing *Ae. aegypti* than CDC backpack aspirators, and also collect adult females in all physiological states (Maciel-de-Freitas et al. 2006, Williams et al. 2006, Ball and Ritchie 2010). These traps are also effective for collecting *Ae. albopictus* (Meeraus et al. 2008, Bhalala and Arias 2009, Farajollahi et al. 2009, Obenauer et al. 2010). The efficiency of BG traps can be increased by baiting them with lures (e.g., CO$_2$, BG-Lure®).

**Gravid female traps:** There are a number of recently developed traps that use similar principles of attraction as the ovitraps; that is, to attract and capture gravid females. These traps either use funnels (Gomes et al. 2007, Eiras et al. 2014) or sticky boards (Mackay et al. 2013, Chadee et al. 2010, Barrera et al. 2013) to prevent captured mosquitoes from
escaping. The advantage of gravid traps is that they are considerably cheaper and easier to operate compared to BG traps.

**Landing–biting counts:** This is one of the oldest and most effective, but labor-intensive techniques used to detect, capture, and quantify host-seeking daytime biting mosquito vectors such as *Ae. aegypti* and *Ae. albopictus*. However, due to potential health risks to field staff, especially in areas with ongoing arbovirus transmission, CDC does not recommend this technique. Another limitation of this collection method is the inherent variation among collectors both in attracting and collecting specimens. A tent trap has been recently developed, which can provide protection to collectors from mosquito bites (Casas-Martinez et al., 2013).

### VI. Mosquito-Based Surveillance Indicators

Data derived from mosquito surveillance primarily estimates mosquito abundance; estimates are used to indicate levels of risk. The indices derived from those data vary in information content, ability to be compared over time and space, and association with arbovirus transmission levels and levels of human risk. The indicators that are commonly used can be broadly divided into 1) immature stage (larvae and pupae) survey indices, 2) eggs per ovitrap per week, 3) female mosquitoes per trap period/week, and 4) adult infection rates (IR).

**Immature stage survey indices**

**Larval surveys (*Stegomyia indices)*:** Larval surveys usually involve identifying all or most of the immature mosquitoes found in every container (or a representative sample of containers) in the target area, home(s) community, neighborhood etc. Every water-holding container is inspected and categorized as positive (contains larvae/pupae) or negative otherwise (no larvae/pupae). The second and less used method is single-larva surveys where only a single larva is identified from each container (Sheppard 1969). The container indices below are computed from survey data.

- **House Index (HI; percentage of houses with at least one positive container)**
- **Container Index (CI; percentage of all containers with water that are larva/pupa positive), and**
- **Breteau Index (BI; number of positive containers per 100 houses (Connor et al. 1923, WHO 2009)).**

Mosquito thresholds for DENV, CHIKV, ZIKV and YFV transmission using larval indices should be determined by each local vector control program for each location; state or national wide thresholds should be used with caution. It was proposed that a House Index of 5% (Soper, 1967), a Container Index of 10% (Connor et al., 1923), or a Breteau Index of 5 (Brown, 1977) prevented YFV transmission, and that HI of 1% suppressed DENV transmission (Pontes et al., 2000). Such thresholds may not apply to all locations and to all arboviruses. A recent study in Taiwan reported the following container *Aedes* threshold values for DENV transmission: BI= 1.2, CI= 1.8%, and HI= 1% (Chang et al. 2015).
**Pupal surveys:** Pupal surveys (pupae per house, per person, per hectare) are based on the assumption that pupal productivity is a better estimate of the adult population than the traditional indices (HI, CI, and BI) or larval counts (Focks 2003). Pupal surveys can also identify the types of containers that produce the majority of adult mosquitoes; these data can help vector control programs identify target containers for enhanced surveillance and control (Focks and Chadee 1997, Nathan and Focks 2006). Pupal surveys usually involve sampling large numbers of houses and containers to obtain reliable estimates (Reuben et al. 1978, Barrera et al. 2006a, b). However, several methods have been developed to guide sample size requirements for pupal surveys (Alexander et al. 2006, Barrera et al. 2006a, b, Barrera 2009).

As with larval surveys, pupal surveys to determine DENV, CHIKV, ZIKV and YFV transmission thresholds (pupal abundance indices) should be determined by each local vector control program for each location. Currently there is no information on pupal indices on CHIKV and ZIKV transmission, however some models show that it takes between 0.5 and 1.5 *Ae. aegypti* pupae per person to sustain DENV transmission at 28°C in a human population with 0 – 67% immunity (Focks et al. 2000).

**Eggs per ovitrap per week.** Although no specific threshold values have been established for each arbovirus, absence of dengue hemorrhagic fever cases in Thailand was noted when the densities of *Ae. aegypti* eggs per ovitrap per week was less than two (Mogi et al. 1990). Also, although using a different ovitrap, DENV transmission occurred in Taiwan when the density of eggs per house (2 ovitraps/house) was around two (Wu et al. 2013).

**Adult infection rates**

In the past, *Ae. aegypti* and *Ae. albopictus* surveillance has relied heavily on immature indices because until recently it has been difficult to monitor adult mosquito abundance. However, the BG Sentinel Trap and a variety of gravid traps make it possible to accurately estimate adult mosquito abundance and to track infected mosquitoes. Tracking adult infected mosquitoes may help establish entomological infection rate thresholds for human disease risk for DENV, CHIKV, ZIKV and YFV transmission similar to work performed for West Nile, St. Louis, and Eastern equine encephalitis viruses (CDC 2013). The infection indices used are the same as those used for other arboviruses: Minimum Infection Rate (MIR), Maximum Likelihood Estimates of the Infection Rate (MLE), and Vector Index (VI) (CDC 2013). However, adult mosquito infection rates cannot be used to predict outbreaks in DENV, CHIKV, ZIKV and YFV surveillance programs because of the very limited data on infection rates and prevalence of human infections. Data obtained in DENV surveillance programs show that, in some cases, an elevation in mosquito infection rates precede outbreaks or increased transmission (Chow et al. 1998, Mendez et al 2006) but not in others (Chen et al., 2010). These mixed results make it difficult to establish threshold mosquito infection rates for human infections and outbreaks for DENV. However, these studies used different mosquito collection methods.
and there is a chance data obtained from BG Sentinel traps and gravid traps may improve abundance and infection rate estimates, and provide timely risk assessment.

VII. Handling of field-collected adult mosquitoes

Because virologic surveillance relies on identifying DENV, CHIKV, ZIKV, and YFV in the collected mosquitoes through detection of viral proteins, viral RNA, or live virus, efforts should be made to handle and process the specimens in a way that minimizes exposure to conditions (e.g., heat, successive freeze-thaw cycles) that would degrade the virus. It has been shown that DENV and CHIKV RNA could be detected by RT-PCR in dead mosquitoes exposed in sticky cards or dried at ambient temperature for several weeks (Bangs et al. 2001; Mavale et al. 2012).

- Optimally, a cold chain should be maintained from the time mosquitoes are removed from the traps to the time they are delivered to the processing laboratory, and through any short-term storage and processing.
- Transport mosquitoes from the field in a cooler either with cold packs or on dry ice. Sort and identify the mosquitoes to species on a chill-table or tray of ice if available.
- If arbovirus screening is not done immediately after mosquito identification and pooling, the pooled samples should be stored frozen, optimally at -70°C, but temperatures below freezing may suffice for short-term storage.


VIII. Limitations to mosquito-based surveillance

- Currently available information on adult infection rates and larval/pupal indices may not predict risk for human infection.
- Larval/pupal surveys may miss cryptic, often overlooked habitats (e.g. gutters, broken septic tanks, sprinkler heads/assemblies, storm drains, etc.) and fail to provide accurate data on the relative abundance of the vector species.
- Larval/pupal indices may not correlate with adult mosquito abundance.
- Developing useful thresholds requires consistent effort to assure the surveillance indices and their association to human risk is comparable over time. Mosquito surveillance and human disease incidence data collected over several transmission seasons is required to produce useful predictive indicators. However, this is challenging to obtain with only sporadic arboviral outbreaks.

General guidelines for the diagnosis, treatment, prevention, and control of DENV and CHIKV have been published (PAHO 2011; WHO 2009).
Control of immature stages

An important step in *Ae. aegypti* and *Ae. albopictus* control operations is identifying the types and abundance of containers producing mosquitoes and their productivity. Different containers require specific control measures that depend on the nature of the container and how it is used. There are five general types of containers producing *Ae. aegypti* and *Ae. albopictus*:

- Phytotelmata (tree holes, leaf axils, etc.)
- Non-essential or disposable containers (food and drink containers, tires, broken appliances)
- Useful containers (water-storage vessels, potted plants and trivets, animal drinking pans, paint trays, toys, pails, septic tanks)
- Cavities in structures (fence poles, bricks, uneven floors and roofs, roof gutters, air-conditioner trays)
- Outdoor underground structures (storms drains, water meters, public wells, septic tanks)

Commonly used larvae/immature control methods

**Environmental sanitation:** This is the permanent elimination of containers producing *Ae. aegypti* and *Ae. albopictus* such as establishing municipal refuse recycling programs (glass, metal, and plastic), used-tire recycling operations, etc.

**Larvicides:** This is the use of chemicals or biological agents to kill or prevent development of mosquito immature stages. There are a number of agents that can be used to control mosquito production in containers:

- Chemical larvicides (temephos)
- Biological larvicides: These include products containing *Bacillus thuringiensis* var. *israelensis* (B.t.i.), spinosad, and Insect Growth Regulators (IGRs) such as juvenile hormone analogs (methoprene, pyriproxyfen) and chitin synthesis inhibitors (Diflubenzuron, Novaluron). Biological larvicides have little or no impact on non-target organisms and do not accumulate in the environment.
- Monomolecular films and oils. These products spread on the water surface forming a thin film that causes suffocation of immature mosquitoes by preventing gas exchange.

Evaluation of the effectiveness of pre-adult mosquito control may be accomplished by comparing the presence/absence and abundance of immature stages in treated containers before and after treatment or by comparing treated and untreated areas (Chadee 2009).

**Biological control:** A variety of aquatic predators may be used especially in large containers. These include carnivorous copepods and larvivorous fish (*Gambusia affinis*). However, biological control may not be practical especially since *Ae. aegypti* and *Ae. albopictus* often develop in small containers.

Control of adult mosquitoes
Chemical control:

- Chemical control of adult mosquitoes includes space spraying, residual spraying, barrier spraying, and using attractive toxic baits.
- Barrier spraying of residual insecticides on external walls of houses and vegetation has been effectively used to reduce exposure to exophilic mosquito species (Anderson et al. 1991, Perich et al. 1993, Cilek 2008), including *Ae. albopictus* (Trout et al., 2007).
- Residual insecticides are used on surfaces that adult mosquitoes frequently visit and land on, such as walls and ceilings, discarded containers, vegetation, curtains, covers for water-storage vessels, lethal ovitrap oviposition strips, etc. There is evidence that indoor residual spraying (IRS) is particularly effective for controlling *Ae. aegypti* (Chadee 1990) primarily due to its indoor resting behavior. However, there are concerns about continuous insecticide exposure for the residents and currently, no residual insecticides are registered in the US for widespread spraying of indoor areas to control of adult mosquitoes.
- Space spraying of insecticides is carried out by backpack, truck- or air-craft mounted equipment.

Attractive toxic sugar baits have been shown to reduce adult populations of *Ae. albopictus* in Florida (Naranjo et al. 2013, Revay et al. 2014). Eugenol (a component of clove oil) and boric acid have been tested as toxicants in these studies. It is not clear whether these baits would work against *Ae. aegypti* in tropical urban areas because it has been reported that females of this species do not commonly consume sugars (Costero et al. 1998).

Using insecticide to control adult mosquitoes should always include insecticide resistance monitoring and management. Insecticide resistance has been demonstrated in almost every class of insecticide, including microbial pesticides and IGRs (Brogdon and McAllister 1998a). Insecticide resistance, which is an inheritable trait, usually leads to significant reduction in the susceptibility of insect populations which renders insecticide treatments ineffective. Insecticide resistance may be monitored using bioassays in larvae and adult mosquitoes (WHO 2009, Brogdon and McAllister 1998b[PDF - 28 pages]).

Physical control (non-insecticidal mosquito traps):

Gravid female mosquitoes can be lured to traps baited with an oviposition medium and captured using sticky glue while attempting to lay eggs (CDC Autocidal Gravid Ovitrap, AGO trap; Barrera et al. 2014a, b; Mackay et al. 2013). The use of three AGO traps per home in more than 85% of houses in neighborhoods in southern Puerto Rico has shown sustained and effective reductions of *Ae. aegypti* populations (80%).

Personal Protection/Repellents:

CDC recommends the use of products containing active ingredients which have been registered by the U.S. Environmental Protection Agency (EPA) for use as repellents applied to skin and
clothing. EPA registration of repellent active ingredients indicates the materials have been reviewed and approved for efficacy and human safety when applied according to the instructions on the label. For more details, visit http://www.cdc.gov/westnile/faq/repellent.html.
Appendix E – Zika Communications Plan

1. Goals and Objectives:
   - The primary communication goal of VDH for the response to ZIKA is to ensure timely, accurate, honest and consistent messages and flow of information.
   - Be first. Be right. Be credible.
   - VDH will provide information on ZIKA to the general public and to a variety of targeted audiences (See section 6).

2. Primary Messages to Communicate about ZIKA:
   - **Prevention:** The best way to prevent ZIKA is to prevent mosquito bites. There is no vaccine.
   - **Explain who’s most at risk:** pregnant women; women of child-bearing age; travelers; and general public
   - **Explain response:** Provide details on what is being done to respond to situation. (Mosquito control, surveillance, backyards)
   - VDH will do everything possible to prevent, control and decrease the spread of ZIKA. (Working with jurisdictional partners, ZIKA Task Force, CDC etc.)

3. Protocols for Information Dissemination:
   - VDH recognizes that ZIKA virus disease will generate ongoing media attention.
   - The Office of Epidemiology (OEpi) will create approved messages immediately and update them weekly. Under the direction of the State Epidemiologist, the OEpi Division of Environmental Epidemiology (DEE) will lead the development and review of ZIKA-related materials and information for targeted audiences.
   - Once material is approved by the State Epidemiologist and Chief Deputy for Public Health & Preparedness, the Risk Communication Manager will lead the release of ZIKA-related materials and information statewide with the assistance as needed by the Regional Public Information Officers (PIOs) in coordination with District Health Directors and District-Designated PIOs.
   - Health Districts may create their own ZIKA materials using the VDH branding guidance, talking points and materials from the VDH website (Zika Virus webpages and EPI Disease Control Manual) and CDC Zika website. If districts want to create materials using other resources, they must be reviewed and approved by OEpi and ORCE (coordinate through Regional PIOs). Turnaround time for approval would be within 3 days.
• County/city communication materials (with the jurisdiction’s name and contact information, not the local health district’s), even if the local health district provided input, DO NOT need to be reviewed/approved by OEpi and ORCE.

• ORCE’s Risk Communication Manager will oversee all statewide media relations activities.

• The State Epidemiologist will lead efforts to ensure communication between all health care providers is handled appropriately.

• In the event of a state of emergency declaration by the Governor, the Virginia Department of Emergency Management’s Office of Public Affairs becomes the lead state agency for the organization and management of the dissemination of information. VDH functions (as described within this plan) would be coordinated through the VDEM Joint Information Center (JIC). VDH representatives serve on the JIC.

4. Spokespersons:

• VDH State Health Commissioner, Chief Deputy Commissioner for Public Health and Preparedness, State Epidemiologist (or her designee), and State Entomologist will serve as the principle spokespersons on the state level in regards to ZIKA. The Director of the Office of Emergency Preparedness will serve as spokesperson for state ZIKA action plan (ZAP) and Governor’s ZIKA Task Force.

• On the local level, the Local Health Directors (or their designees) will serve as the spokespersons. The District-Designated PIOs and Regional PIOs will provide information to media outlets but will arrange interviews with the noted medical spokespersons in most cases to provide expert and credible quotes and sound bites. A list of each district’s primary and secondary spokesperson is at the end this appendix.

5. Methods:

• VDH will disseminate information to external audiences through a variety of methods (See Section 6).

• VDH will disseminate information specific to VDH staff through the internal website, e-mail, conference calls, and video conference meetings.

• VDH Risk Communication team will coordinate/share information with the Governor’s and Secretary’s offices. A news release from the Governor will be going out ahead of the May 1 start of mosquito season.

• For non-English speaking populations, VDH will use translated ZIKA materials provided by the CDC, or for customized information, the agency will utilize two existing statewide translation services contracts for any VDH-specific material not created by CDC. The contracts
are with Language Services (Contract#1200019-501AA) and Proprio (Contract#1200020-501AA).

- VDH will use 2-1-1 for calls from the general public seeking general information about ZIKA, if evolving situation requires.

- If local health districts choose to establish local call centers, they should utilize the VDH FAQs as well as any district-specific details. If districts want to create additional FAQs, they must be reviewed and approved by EPI and Risk Communication (Coordinate through Regional PIOs). Turnaround time within 3 days.

- The ZIKA case count on the VDH external website will be updated weekly, each Thursday by 9 a.m.

- A special url has been purchased to provide public and others seeking public health-related Zika information – www.ZikaVA.org. Shorter and easier to remember, the page sends users to VDH webpages/Zika resources.

6. **Targeted Audiences and Materials:**

<table>
<thead>
<tr>
<th>Targeted Audiences</th>
<th>Purpose</th>
<th>Materials</th>
<th>Purpose/Distribution</th>
<th>Timeline</th>
</tr>
</thead>
</table>
| Pregnant Women     | Prevention | VDH Zika and Pregnancy Flier | • VDH Clinics  
  • VDH website, VDH FB and LinkedIn Clinicians pages | Completed |
|                    |          | • CDC Printed materials  
  • CDC Social media | • District staff and others disseminate materials to local OB/GYNs and FM (safety net and private providers) to provide to their patients  
  • VDH website & social media accounts | Available |
| Animated videos and PSA with Dr. Levine (5 total) |          | VDH website  
  • PSA on targeted TV and radio  
  • VDH YouTube  
  • Movie screens | Completed |
| Paid advertising   |          | Social media sites  
  • Targeted TV and radio | Campaign continues |
| Guidance (Pregnant Women Exposed to Zika virus) |          | VDH Zika website,  
  Clinician Letters, VDH | Provide information through clinicians  
  • VDH Clinician specific social media accounts (Facebook for Clinicians & LinkedIn for Clinicians) and VDH website  
  • District staff and MRCs | Ongoing |
<table>
<thead>
<tr>
<th>Targeted Audiences</th>
<th>Purpose</th>
<th>Materials</th>
<th>Purpose/Distribution</th>
<th>Timeline</th>
</tr>
</thead>
</table>
| Couples Seeking Pregnancy | Prevention | Social media | disseminate materials to OB/GYNs and family medicine (safety net and private providers)  
  • Clinician’s letter with links to materials  
  • Pregnancy Registry Cards | May 8- through end of mosquito season |
| Sexually active persons | Prevention | Social media | VDH social media sites  
  Online paid ads/campaign | May 8-through end of mosquito season |
| Travelers | Prevention | Social media campaign | VDH social sites | May 8 – through mosquito season |
| | | Signage | Airports (Dulles, Regan National, Richmond and Roanoke. ) Also prevention materials at Port of Norfolk | July 25 through end of mosquito season |
| General Public | Awareness and Prevention | Press releases at each stage (mosquito season begins, first local transmission, multiperson local transmission) | Statewide media – State is lead until further notice.  
  Governor press release ahead of Mosquito season | April 25 through end of mosquito season |
| | | Animated videos | • VDH website  
  • VDH social media | Ongoing through end of mosquito season |
| | | Zika weather related messages once local transmission confirmed | • TV and radio news meteorologists | In progress/ reach out meteorologists contacted |
| | | Door hangers | • District staff and others disseminate materials  
  • Local government mosquito control staff disseminate materials | 925,000 door hangers printed |
| VA Clinicians | Prevention and Response | Clinical guidance | • Work with VACOG and VAFM to identify how to get CDC materials to clinicians who provide prenatal care  
  • Clinician Letters | Underway/Ongoing |
<table>
<thead>
<tr>
<th>Targeted Audiences</th>
<th>Purpose</th>
<th>Materials</th>
<th>Purpose/Distribution</th>
<th>Timeline</th>
</tr>
</thead>
</table>
| Government Officials | Awareness, response and vector control | Multi-scenario Messaging Developed and reviewed by Gov. Zika Task Force | • State level briefings by SHC and Central Office staff to Governor, Secretary, VDEM  
• Local government briefings by District Health Directors  
• District staff coordinate with local mosquito control staff | Ongoing |
| VDH Employees | Public Health Messaging and Ambassadors | Main Messages | • VDH intranet  
• Madison Building TV monitors | Ongoing |

7. **Monitoring Emerging Communication Issues:**

- VDH Risk Communication Team will monitor media reports on ZIKA through its daily traditional media monitoring and add social media monitoring once mosquito season begins and continues as other milestones are reached (locally acquired transmission and multiperson local transmission) to gage reaction to the situation and to look for instances of misinformation to be corrected.

- VDH also has existing relationships and open lines of communication with state agency and jurisdictional PIOs, and stakeholders on the state and local level in order to receive requests for information or questions concerning particular aspects of the ZIKA virus response. The ZIKA Task Force will continue to meet and share issues, questions, and topics needing clarification.

- VDH will immediately respond to misinformation or questions regarding particular issues though social media, “posting correct” information on VDH accounts, phone calls or e-mails directly to reporters or the organization in order to correct or clarify any misinformation.

8. **Evaluation:**

- Wherever possible, analytics will be used to measure and reassess materials throughout the campaign. Videos, social media banners, paid search ads and door hangers will include a Zika Virginia specific domain name (www.ZikaVA.org) and specific QR codes as a way to capture metrics. Will also perform a mid-response analytic review to see if a mid-course correction needs to be made or a shift in ad placements.
• When it comes to Twitter/tweets, VDH main account will be primary mode, with other VDH and districts retweeting. We ask this so we can capture the metrics. If a local health district wants to put a district-specific tweet, please share with ORCE for awareness, and where appropriate, VDH main account will retweet.

9. **Other Issues for Consideration:**

• VDH will limit any potentially identifying information released about individuals under investigation as locally acquired cases.
• As mosquito season continues and response moves into Phase 2 (Single Confirmed Local Transmission) and/or Phase 3 (Confirmed Multiperson Local Transmission: Zika Transmission Area) communication needs will intensify.
• Announcement of Local Transmission has potential to include Governor’s Office/Secretary’s Office, Health Commissioner, Local Health Directors and local partners/stakeholders and will be a multimedia event utilizing news releases, press briefing, tweets and posts, updated information of website, talking points, and potential for Facebook Live streaming and/or Periscope.
• GIS-targeted messaging and prevention steps to take for pregnant women and individuals who live, work or visited Zika Transmission Area.
• Daily website updates on cases and mosquito control and surveillance in Zika Transmission area.
Appendix F – Zika Mosquito Messages

Zika mosquito messages have been developed for each phase of operations described in the body of this Annex (Preparedness; Mosquito Season; Single Confirmed Local Transmission; and Confirmed Multiperson Local Transmission: Zika Transmission Area). Messages for each phase are organized below by the following categories:

- Prevention Messages:
  - Personal Protection from Mosquitoes
  - Actions to Take Around the Home
  - Proper Pesticide Use for Mosquitoes that Carry Zika (Information from VDACS)
- Mosquitoes and Zika infection in Virginia (general info on transmission)
- Mosquito control in Virginia (breeding and control)

Messaging at each phase will include all the messages outlined in the tables below as well as the messages that apply to all or multiple phases. Much basic information stays the same through each phase, but some changes slightly, and new information is included in each phase. Information that changes or is added between the phases is bolded for easy reference.


Messages through all Phases (Preparedness; Mosquito Season; Single Confirmed Local Transmission; and Confirmed Multiperson Local Transmission: Zika Transmission Area)

Prevention Messages


<table>
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<tr>
<th>PHASE</th>
<th>MESSAGES</th>
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</table>

Currently, there is no vaccine to prevent Zika infection, so preventing being bitten is very important.

- Wear long-sleeved shirts, long pants and socks.
- Stay in places with air-conditioning or that use window and door screens to keep mosquitoes outside.
- Sleep under a mosquito bed net if you are overseas or outside and not able to
- Use Environmental Protection Agency (EPA)-registered insect repellents. When used as directed, EPA-registered insect repellents are proven safe and effective, even for pregnant and breast-feeding women.
  - Always follow the product label instructions.
  - Reapply insect repellent as directed.
  - Do not spray repellent on the skin under clothing.
  - If you are also using sunscreen, apply sunscreen before applying insect repellent.
- If you have a baby or child:
  - Do not use insect repellent on babies younger than 2 months of age.
  - Dress your child in clothing that covers arms and legs, or cover crib, stroller, and baby carrier with mosquito netting.
  - Do not apply insect repellent onto a child’s hands, eyes, mouth, and cut or irritated skin.
  - Adults: Spray insect repellent onto your hands and then apply to a child’s face.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
  - Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
  - If treating items yourself, follow the product instructions carefully.
  - Do NOT use permethrin products directly on skin. They are intended to treat clothing.

### Actions to Take around the Home (“Tip, Toss & Cover” Campaign)

<table>
<thead>
<tr>
<th>All Phases</th>
<th>Actions to Take Around the Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1,2,3“Tip, Toss &amp; Cover” Campaign (English &amp; Spanish)</td>
<td>Stop mosquitoes from living and multiplying around your home or business.</td>
</tr>
<tr>
<td></td>
<td>Everyone can take several simple actions around their home and neighborhood to reduce the population of mosquitoes that can carry Zika virus.</td>
</tr>
<tr>
<td></td>
<td><strong>TIP AND TOSS --</strong></td>
</tr>
<tr>
<td></td>
<td>Once a week:</td>
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<tr>
<td></td>
<td>Tip Containers – drain standing water from garbage cans, house gutters, downspout extenders, pool covers, coolers, toys, flower pots or any other containers where sprinklers or rainwater has collected.</td>
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<tr>
<td></td>
<td>Toss – discard old tires, drums, bottles, cans, pots and pans, broken appliances and other items outside that aren’t being used.</td>
</tr>
<tr>
<td></td>
<td>Empty and Scrub – birdbaths and pets’ water bowls at least once or twice a week.</td>
</tr>
<tr>
<td></td>
<td>Protect – boats and vehicles from rain with tarps that don’t accumulate water.</td>
</tr>
<tr>
<td></td>
<td>Once a month:</td>
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<tr>
<td></td>
<td>Maintain – apply a larvicide to standing water that cannot be emptied or drained. Larvicides can be found at garden centers and hardware stores.</td>
</tr>
<tr>
<td></td>
<td><strong>COVER YOUR SKIN WITH --</strong></td>
</tr>
</tbody>
</table>
Clothing – cover up when you’re outside! Wear long, loose and light-colored clothing, and shoes and socks.
Repellent – apply EPA-registered mosquito repellent to bare skin and to clothing. Always use repellents according to the label. Use mosquito netting to protect children younger than 2 months.

**Proper Pesticide Use for Mosquitoes that Carry Zika** (Information provided by Virginia Department of Agriculture & Consumer Services)

<table>
<thead>
<tr>
<th>All Phases</th>
<th>0,1,2,3(VDACS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read and Follow the label directions</strong> of any pesticide to protect yourself, others and the environment.</td>
<td></td>
</tr>
<tr>
<td>The label directions will describe the pesticide, tell you how to properly apply it, list protections for the user and the environment, and provide appropriate first-aid actions to take.</td>
<td></td>
</tr>
<tr>
<td>Pesticides labeled for outdoor areas only should not be used indoors.</td>
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</tr>
<tr>
<td>Only use a pesticide labeled for the type of pest it is intended to control.</td>
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</tr>
<tr>
<td>To be legal for use in Virginia, a pesticide must be registered with the Department of Agriculture and Consumer Services’ (VDACS) Office of Pesticide Services (OPS). You can check to see if a specific pesticide is registered by visiting <a href="http://www.vdacs.virginia.gov/pesticide-product-registration.shtml">http://www.vdacs.virginia.gov/pesticide-product-registration.shtml</a>.</td>
<td></td>
</tr>
<tr>
<td>If you decide to hire a commercial pest control company, check that it is licensed and that its applicators are certified.</td>
<td></td>
</tr>
<tr>
<td>For more information related to pesticides and their proper use, please visit <a href="http://www.vapesticidesafety.com">www.vapesticidesafety.com</a>.</td>
<td></td>
</tr>
</tbody>
</table>
**Phase 0 (Preparedness) and Phase 1 (Mosquito Season)**

**Mosquitos and Zika infection in Virginia**

<table>
<thead>
<tr>
<th>Phase 0 (Preparedness) and Phase 1 (Mosquito Season)</th>
<th>PHASE</th>
<th>MESSAGES</th>
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<tbody>
<tr>
<td></td>
<td>0,1</td>
<td><strong>Mosquitos and Zika infection in Virginia:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• People in Virginia can acquire Zika through the bite of an infected mosquito, during travel to an <strong>area where the virus is circulating</strong> among mosquitoes.</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
<td>• The infection is transmitted primarily by mosquitoes. It is most commonly transmitted by the yellow fever mosquito (<em>Aedes aegypti</em>), but the Asian tiger mosquito (<em>Aedes albopictus</em>) can also transmit it.</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
<td>• Both of these mosquito species circulate in Virginia, with Asian tiger mosquitoes being the most common nuisance mosquito here. Therefore, there is a risk of Zika virus being imported into Virginia and being transmitted by local mosquitoes during mosquito season. If that happens, infection by mosquito bite may be possible.</td>
</tr>
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</table>

**Mosquito Control in Virginia**

<table>
<thead>
<tr>
<th>Phase 0 (Preparedness) and Phase 1 (Mosquito Season)</th>
<th>PHASE</th>
<th>MESSAGES</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0,1</td>
<td><strong>Mosquito control in Virginia:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mosquito season has begun, so there is potential for our local yellow fever mosquitoes and Asian tiger mosquitoes to become infected with the Zika virus by biting infected persons who have returned from areas of Zika activity.</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
<td>• These two mosquito species are different from most other mosquito species in Virginia because they fly and bite during daylight hours and will enter homes through any open door or window and bite indoors. These two species are also different from other species because they lay their eggs exclusively in containers of water (i.e. containers made of plastic, ceramic, glass, metal, concrete, wood or stone) and they do not lay their eggs in “ground” bodies of water such as puddles, flooded ditches, ponds or streams.</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
<td>• <strong>Some localities may have mosquito surveillance, prevention and control programs.</strong> Those programs, if any, can vary widely from locality to locality. For information on whether your city or county has a program, please contact your local government’s administrative office.</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
<td>• Control and prevention for these two mosquito species requires tactics that are different than what is normally used for other mosquito species. For example, treating neighborhoods with truck-mounted foggers and larviciding puddles and stagnant water in ditches, swamps, or streams will not control either of these two mosquito species. Mosquito control and prevention requires:</td>
</tr>
<tr>
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<td></td>
<td>o Thorough inspection of residential and commercial properties to find and eliminate, dump, or treat the containers of water that these mosquito species lay their eggs in. Effective treatment of a neighborhood often requires a property to property effort.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Spraying aerosol fogs into the foliage of shrubs, hedges, ivy and other vegetation or structures where these mosquitoes sit.</td>
</tr>
</tbody>
</table>
o Spraying residual insecticide barriers on the foliage of shrubs, hedges, ivy, other low vegetation or walls on properties where these mosquitoes are abundant. “Residual” means that the insecticide stays effective for a longer period of time.
o Maintaining screens on all home/building windows and doors to prevent the entry of these mosquitoes into the home.

### Phase 2 (Confirmed Local Transmission)

- **Communication:**

  Develop and disseminate information on confirmed local transmission for the public, clinicians, news and social media with a focus on protecting pregnant women, women of childbearing age, sexual partners of pregnant women and other vulnerable positions such as translating information on confirmed local transmission in Spanish. Include personal protection measures to reduce the risk of infection as well as urge community action and support for protective measures such as vector control. Continue to emphasize what we know and what we don’t know in messaging, whenever appropriate.

  **Message/Overarching Privacy Rule** – Define location of single confirmed local transmission case to the district/county/city level. Travel-associated cases remain identified at the Regional level.

- **Risk communication will focus on:**

  o Reinforcing existing messages on personal protective measures that can be taken to reduce the risk of infection through mosquito bites and sexual contact.

  o Outreach to pregnant women and women of reproductive age, and their families/partners, with enhanced recommendations for personal protective measures.

  o Following established risk communication principles to help build trust in local health authorities, inform the public about what is known and what is not known, provide actions people can take to protect themselves and their families, and minimize the potential for public misunderstanding, rumors, and fear.

<table>
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<tr>
<th>Phase 2</th>
<th>MESSAGES</th>
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  **Add/emphasize: If you have Zika, protect others from getting sick**

  During the first week of infection, Zika virus can be found in the blood and passed from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people.

  To help prevent others from getting sick, avoid mosquito bites during the first week of illness.
### Phase 2

#### PHASE 2 MESSAGES

**2**  
**Mosquitoes and Zika infection in Virginia:**
- People in Virginia can acquire Zika through the bite of an infected mosquito, either during travel to an area where the virus is circulating among mosquitoes or, less likely, from the bite of an infected mosquito in Virginia.
- The infection is transmitted primarily by mosquitoes. It is most commonly transmitted by the yellow fever mosquito (*Aedes aegypti*), but the Asian tiger mosquito (*Aedes albopictus*) can also transmit it.
- Both of these mosquito species circulate in Virginia, with Asian tiger mosquitoes being the most common nuisance mosquito here.
- Zika virus infection is confirmed and the epidemiologic investigation finds that the person’s most likely source of infection was through the bite of a mosquito bite in Virginia. This is called local transmission.

**2**  
**Mosquito control in Virginia:**
- Since a non-travel related case(s) of Zika virus disease has been confirmed in Virginia, mosquito experts have determined that our local yellow fever mosquitoes and Asian tiger mosquitoes have become infected with the Zika virus and are able to transmit it locally. Therefore, it is important to be aware of these mosquitoes’ habits to prevent being bitten and to find and eliminate their breeding sites.
- These two mosquito species are different from most other mosquito species in Virginia because they fly and bite during daylight hours and will enter homes through any open door or window and bite indoors. These two species are also different from other species because they lay their eggs exclusively in containers of water (i.e. containers made of plastic, ceramic, glass, metal, concrete, wood or stone) and they do not lay their eggs in “ground” bodies of water such as puddles, flooded ditches, ponds or streams.
- Some localities may have mosquito surveillance, prevention and control programs. Those programs, if any, can vary widely from locality to locality. For information on whether your city or county has a program, please contact your local government’s administrative office.
- Control and prevention for these two mosquito species requires tactics that are different than what is normally used for other mosquito species. For example, the treating of neighborhoods with truck-mounted foggers and larviciding puddles and stagnant water in ditches, swamps or streams will not control either of these two mosquito species. Mosquito control and prevention requires:
  - Inspecting residential and commercial properties thoroughly to find and eliminate, dump, or treat the containers of water that these mosquito species...
lay their eggs in. Effective treatment of a neighborhood often requires a property to property effort.

- Spraying aerosol fogs into the foliage of shrubs, hedges, ivy and other vegetation or structures where these mosquitoes sit.
- Spraying residual insecticide barriers on the foliage of shrubs, hedges, ivy, other low vegetation or walls on properties where these mosquitoes are abundant. “Residual” means that the insecticide stays effective for a longer period of time.
- Maintaining screens on all home/building windows and doors to prevent the entry of these mosquitoes into the home.

**Phase 3 (Confirmed Multiperson Local Transmission: Zika Transmission Area)**

**Communication:**

Develop and disseminate information on evidence of continuous transmission and subsequent definition of geographic boundaries for the response. Extent of response will depend on the number of cases and their geographic distribution as a measure of the extent of mosquito-borne transmission. (Definitions and Identification of Zika transmission area will be as prescribed in Appendix F of this Plan: Identification of Zika Transmission Area and Action Steps for Local Health Departments)

**Message/Overarching Privacy Rule** – Define location of confirmed, multiperson local transmission on a case-by-case basis that is a balance of being small enough to have an impact and protect pregnant women from the virus and large enough to protect privacy/private health information.

Risk communication will focus on:

- Identification of the description of the Zika transmission area defined above.
- Identification of an estimated date when local Zika transmission began.
- Targeted messages and action steps for people who will travel to, live within or routinely commute into the defined Zika transmission area for work or other activities, with enhanced measures to be taken by pregnant women and women wishing to conceive and their sex partners.
  - Messages will enumerate all of the surveillance and response efforts taking place in the affected area and provide objective assessments of the situation and scale of the public health threat.
  - Messages will advise pregnant women to avoid travel to the area, (or, if they must travel, to consult with their health care provider and strictly follow steps to avoid mosquito bites), and will advise all people who must travel to or live in the area to use personal protective measures to reduce the risk of infection through mosquito bites and sexual contact. These messages should be consistent with US travel notices issued for countries and territories with local Zika virus transmission.
  - Messages will advise all pregnant women (symptomatic and asymptomatic) who live in or have traveled to a Zika transmission area to get tested for Zika virus, in accordance
with CDC guidance. (If transmission continues/intensifies, messages might be prepared to discuss prioritization for testing individuals who live, work or traveled to the area.)
- Messages will advise women and their partners who live in or have traveled to a Zika transmission area to discuss pregnancy planning with their health care provider, including timing of attempting pregnancy and avoiding unintended pregnancy, consistent with guidance provided to Americans living in countries and territories with ongoing Zika transmission.

### Phase 3

<table>
<thead>
<tr>
<th>PHASE</th>
<th>MESSAGES</th>
</tr>
</thead>
</table>

**Add/emphasize in Phase 3:**
- **If you have Zika, protect others from getting sick**
  - During the first week of infection, Zika virus can be found in the blood and passed from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people.

  To help prevent others from getting sick, avoid mosquito bites during the first week of illness.

### Phase 3 ()

<table>
<thead>
<tr>
<th>PHASE</th>
<th>MESSAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>Mosquitoes and Zika infection in Virginia:</strong></td>
</tr>
<tr>
<td></td>
<td>- People in Virginia can acquire Zika through the bite of an infected mosquito in Virginia, or during travel to additional <a href="http://www.cdc.gov/zika/prevention/index.html">areas where the virus is circulating</a> among mosquitoes.</td>
</tr>
<tr>
<td>3</td>
<td>- The infection is transmitted primarily by mosquitoes. It is most commonly transmitted by the yellow fever mosquito (<em>Aedes aegypti</em>), but the Asian tiger mosquito (<em>Aedes albopictus</em>) can also transmit it.</td>
</tr>
<tr>
<td></td>
<td>- Both of these mosquito species circulate in Virginia, with Asian tiger mosquitoes being the most common nuisance mosquito here.</td>
</tr>
<tr>
<td>3</td>
<td>- Zika virus has been confirmed in multiple people who have not traveled to <a href="http://www.cdc.gov/zika/prevention/index.html">areas where the virus is circulating</a> among mosquitoes. That means that mosquitoes in Virginia are infected with the Zika virus, and are transmitting it through their bite to Virginians.</td>
</tr>
</tbody>
</table>

### Mosquito Control in Virginia

<table>
<thead>
<tr>
<th>PHASE</th>
<th>MESSAGES</th>
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<tbody>
<tr>
<td>3</td>
<td><strong>Mosquito control in Virginia:</strong></td>
</tr>
<tr>
<td></td>
<td>- Zika virus disease has become widespread in Virginia, with our local yellow</td>
</tr>
</tbody>
</table>
fever mosquitoes and Asian tiger mosquitoes infected with the Zika virus and transmitting it locally. It is vital to be aware of these mosquitoes’ habits to prevent being bitten and to find and eliminate their breeding sites.

<table>
<thead>
<tr>
<th>3</th>
<th>• These two mosquito species are different from most other mosquito species in Virginia because they fly and bite during daylight hours and will enter homes through any open door or window and bite indoors. These two species are also different from other species because they lay their eggs exclusively in containers of water (i.e. containers made of plastic, ceramic, glass, metal, concrete, wood or stone) and they do not lay their eggs in “ground” bodies of water such as puddles, flooded ditches, ponds or streams.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>• Some localities may have mosquito surveillance, prevention and control programs. Those programs, if any, can vary widely from locality to locality. For information on whether your city or county has a program, please contact your local government’s administrative office.</td>
</tr>
<tr>
<td>3</td>
<td>• Control and prevention for these two mosquito species requires tactics that are different than what is normally used for other mosquito species. For example, the treating neighborhoods with truck-mounted foggers and larviciding puddles and stagnant water in ditches, swamps, or streams will not control either of these two mosquito species. Mosquito control and prevention requires:</td>
</tr>
<tr>
<td></td>
<td>o Thorough inspection of residential and commercial properties to find and eliminate, dump, or treat the containers of water that these mosquito species lay their eggs in. Effective treatment of a neighborhood often requires a property to property effort.</td>
</tr>
<tr>
<td></td>
<td>o Spraying aerosol fogs into the foliage of shrubs, hedges, ivy and other vegetation or structures where these mosquitoes sit.</td>
</tr>
<tr>
<td></td>
<td>o Spraying residual insecticide barriers on the foliage of shrubs, hedges, ivy, other low vegetation or walls on properties where these mosquitoes are abundant. “Residual” means that the insecticide stays effective for a longer period of time.</td>
</tr>
<tr>
<td></td>
<td>o Maintaining screens on all home/building windows and doors to prevent the entry of these mosquitoes into the home.</td>
</tr>
</tbody>
</table>
Appendix G – Identification of Zika Transmission Area and Action Steps for Local Health Departments

Revised Guidance – September 7, 2016

The purpose of this document is to determine presumed geographic boundaries of a “Zika transmission area” in which local vector-borne transmission of Zika virus has occurred, and to facilitate communicating the boundaries of the area to the public so they may take action to protect themselves and others. VDH has developed the following interim guidance and tools to help localities with informing the public, including pregnant women and their families/partners to where Zika virus transmission may be occurring. The guidance in this document is intended to reduce the risk of sustained local vector-borne Zika transmission within the state of Virginia.

Key Definitions:

Local transmission: Vector-borne Zika virus infection in a person who has not traveled to or resided in an area with Zika virus transmission or had unprotected sex or other sexual contact to an infected person, or other known exposure with body fluids, to an infected person.

Suspect case of local transmission: A suspect case of local transmission is defined as

1. A person with symptoms or preliminary test results compatible with Zika virus infection, who does not have risk factors for acquisition through travel, sexual contact, or other known exposure with body fluids and for whom Zika virus test are pending, OR
2. A presumed viremic blood donor (i.e., initial screen positive for Zika virus and confirmatory test pending) who does not have risk factors for Zika acquisition through travel, sexual contact, or other known exposure with body fluids.

Confirmed local transmission: A confirmed case of local transmission is defined as

1. A person who does not have risk factors for Zika acquisition through travel or sexual contact, or other known exposures with body fluids, and who has laboratory evidence of recent Zika virus infection defined as one of the following for the purposes of these guidelines:
   a. Detection of Zika virus by culture, viral antigen or viral RNA in serum, urine, cerebrospinal fluid (CSF), tissue, or other specimen OR
   b. Zika virus IgM antibodies in serum or CSF, OR
2. A blood donor identified through Zika virus screening of blood donations who does not have risk factors for Zika acquisition through travel or sexual contact, and who has a positive Zika virus nucleic acid test (NAT) on screening AND a positive alternate Zika virus NAT or positive Zika virus IgM, OR
3. Confirmed cases without prior history of travel to an area of active Zika transmission and clustered in a single household within a 2-week period (maximum incubation period).
Multiperson local transmission: Two or more geographically linked cases of confirmed local transmission (i.e. not travel-associated, sexually/bodily fluid transmitted) in non-household members with onsets ≥ 2 weeks apart in a 1-mile diameter area.

Zika transmission area: A geographic area in which multiperson local transmission has occurred and may be ongoing.

Note: This guidance document has been developed from the CDC Draft Interim Response Plan for Zika Virus http://www.cdc.gov/zika/pdfs/zika-draft-interim-conus-plan.pdf

Determining the Presumed Geographic Boundaries of a Zika Transmission Area

1. Determine infection status. For purposes of these guidelines:
   a. Infection is suspected if a person has symptoms of Zika virus disease and lab results are pending or a screening test of a blood donor is positive for Zika
   b. Infection is confirmed if a specimen tests positive for Zika by PCR or IgM, including blood donation specimen

2. Determine risk factors for infection. Ascertain if the person traveled to or resided in a known Zika-affected area or had unprotected sex or other sexual contact with an infected person.
   a. If risk factors are present, then local transmission is not suspected; usual Zika response guidelines as outlined in the Disease Control Manual should be followed
   b. If risk factors are not present, then local transmission is suspected

3. Identify specific locations where mosquito exposures were likely within the two weeks before symptom onset (or before identification of the infection if asymptomatic). Discuss among the local public health team to determine possible naming conventions that could be used to denote the area if a public release of information is necessary. Please refer to Table 1 for considerations for defining a Zika transmission area.

4. Confirmed, multiperson local transmission has occurred if geographically linked cases of confirmed local transmission in non-household members with onsets ≥ 2 weeks apart are identified in a 1-mile radius diameter area.
   a. Define an area that is small enough to be meaningful and large enough to protect confidentiality. The area could be a neighborhood, a zip code area, a city, or a county depending on the geographic extent of transmission.
   b. Discuss with the Office of Epidemiology to finalize denotation of the area and to initiate Agency approval for public release of information.
   c. Once approved, coordinate public communication.
d. The Office of Epidemiology will provide CDC with information about the situation and a definition of the area that can be illustrated on a national map.

<table>
<thead>
<tr>
<th>Table 1: Considerations for Defining a Zika Transmission Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Factors</strong></td>
</tr>
<tr>
<td>• Number of cases identified and whether the incidence of cases is increasing or decreasing</td>
</tr>
<tr>
<td>• Known or suspected links between cases (e.g. multiple infections in a household, which may reflect a single prior transmission episode, are of less concern than cases scattered in a neighborhood), including ruling out sexual transmission</td>
</tr>
<tr>
<td>• Geographic distribution of cases in an area (e.g. clustered cases in an area would suggest a higher intensity of transmission)</td>
</tr>
<tr>
<td>• Population density</td>
</tr>
<tr>
<td>• Privacy concerns (i.e. ensuring that individual case patients cannot be identified)</td>
</tr>
<tr>
<td><strong>Mosquito Surveillance</strong></td>
</tr>
<tr>
<td>• Current vector surveillance and control factors</td>
</tr>
<tr>
<td>• History of <em>Ae. aegypti</em> or <em>Ae. albopictus</em> in the area</td>
</tr>
<tr>
<td>• Presence of <em>Ae. aegypti</em> (greater concern) or <em>Ae. albopictus</em></td>
</tr>
<tr>
<td>• Mosquito breeding season remaining</td>
</tr>
<tr>
<td>• Vector control interventions of sufficient intensity likely to eliminate infection incidence in areas where case exposure likely occurred.</td>
</tr>
<tr>
<td><strong>Environmental and ecologic factors</strong></td>
</tr>
<tr>
<td>• History of local dengue or chikungunya virus transmission in the area</td>
</tr>
<tr>
<td>• Area is within estimated geographic range of <em>Ae. aegypti</em> or <em>Ae. albopictus</em></td>
</tr>
<tr>
<td>• Area is below 2000 meters in elevation (elevation above which conditions are not conducive to transmission)</td>
</tr>
<tr>
<td>• Current or projected temperature supports vector activity</td>
</tr>
<tr>
<td>• Cases identified early (which are of more concern) or late (which are of less concern) in mosquito season</td>
</tr>
<tr>
<td><strong>Infrastructure in area</strong></td>
</tr>
<tr>
<td>• Estimated proportion of homes, workplaces, and other settings with air conditioning</td>
</tr>
<tr>
<td>• Estimated proportion of homes, workplaces, and other settings with intact screens on windows and doors</td>
</tr>
<tr>
<td>• Estimated proportion of homes, workplaces, and other settings with non-secured water catchment systems</td>
</tr>
</tbody>
</table>


**Action Steps for Virginia Department of Health (VDH) in the Event of Suspected or Confirmed Local Zika Virus Transmission**

**Single Suspect Case of Local Transmission or Presumed Viremic Blood Donor**

- Initiate epidemiologic investigation and enhance case surveillance to identify other possible cases of local transmission
• Notify blood collection centers

• Risk communication should focus on:
  - Reinforcing existing messaging on personal protective measures that can be taken to risk the risk of infection through mosquito bites or sexual contact
  - Outreach to pregnant women and women of reproductive age, and their families/partners, reinforcing the importance of personal protective measures

**Confirmed Local Transmission**

• Work with the Office of Epidemiology to determine the geographic area(s) to initiate indicated public health interventions (Table 1) including the following:
  - Increased public communication about the importance of mosquito bite prevention and reduction of mosquito habitat in the area.
  - Enhanced case surveillance, including urosurvey, to identify other possible cases of local transmission
  - Increased mosquito surveillance and control activities
  - Enhanced risk communication, outreach, and other response efforts

• Prepare and issue a media statement

• Office of Epidemiology will notify blood collection centers

• Coordinate public communication for people who live, work, and plan to travel to Zika transmission area
  - Implement planned risk communications activities that ensure that prevention recommendations are widely distributed to reach audiences within the affected jurisdictions

• Follow established risk communication principles to build trust in local health authorities, informing the public what is and is not known, providing preventative measures and guidance to minimize the potential for public misunderstanding, rumors, and fear

• Outreach to pregnant women and women of reproductive age, and their families/partners, with enhanced recommendations for personal protective measures

**Multiperson Local Transmission**

• Prepare and issue a media statement

• Initiate epidemiologic, entomologic, and environmental investigations to determine the extent of local transmission.

• Work with the Office of Epidemiology to determine or expand the geographic area(s) to initiate indicated public health interventions (Table 1)
• The Office of Epidemiology will provide CDC with information about the situation and a
definition of the area that can be illustrated on a national map.

• Notify blood collection centers

• Ensure widespread distribution of prevention recommendations to key stakeholders

• Ensure wide dissemination of local transmission guidance to relevant stakeholders such as
laboratories, health care providers, blood collection centers, CDC, tribal leaders, and neighboring
states

• Assess state plan to identify and provide resources for specific communities as necessary to
minimize exposure risk to people who live in, work in, and must travel to, the Zika transmission
area, particularly for pregnant women and their partners

• Institute surge lab capacity plans as required to ensure timely testing of all pregnant women
(symptomatic and asymptomatic) in or near the Zika transmission area, consistent with CDC
guidance

• Engage early with businesses and labor stakeholders to prepare for the potential economic
impacts of identifying a Zika transmission area.

• Continue to assess the ongoing local transmission, at least weekly.

• Prepare and implement a protocol and communication strategy to discontinue the designation of
Zika transmission area when local transmission occurs.

• Risk communication should focus on:
  o Identification of the description of the Zika transmission area defined above.
  o Identification of an estimated date when local Zika transmission began.
  o Targeted risk communication messages and action steps for people who will travel to,
live within or routinely commute into the defined Zika transmission area for work or
other activities, with enhanced measures to be taken by pregnant women and women
wishing to conceive and their sex partners.
  o Messages should enumerate all of the surveillance and response efforts taking place in
the affected area and provide objective assessments of the situation and scale of the
public health threat.
  o Messages should advise pregnant women to avoid travel to the area, (or, if they must
travel, to consult with their healthcare provider and strictly follow steps to avoid
mosquito bites), and should advise all people who must travel to or live in the area to use
personal protective measures to reduce the risk of infection through mosquito bites and
sexual contact.
  o Messages should advise all pregnant women (symptomatic and asymptomatic) who live
in or have traveled to a Zika transmission area to get tested for Zika virus. Pregnant
women will be prioritized for diagnostic testing, followed by symptomatic people, except
in circumstances where testing a limited number of symptomatic people is crucial for
monitoring key epidemiologic factors.
Messages should advise women and their partners who live in or have traveled to a Zika transmission area to discuss pregnancy planning with their healthcare provider, including timing of attempting pregnancy and avoiding unintended pregnancy.
Appendix H – Resources and References for Zika Public Education and Outreach

VDH Internal Website

- OEpi Disease Control Manual contains (this is the full list – could shorten if you want)
  - Zika Guidelines (rev. 7/13/2016)
  - VDH Fact Sheet on Zika virus infection (rev. 4/15/16)
  - CDC Zika Web Page
  - CDC Q and A's for Obstetrical Healthcare Providers: Pregnant Women and Zika virus infection
  - VDH FAQs about Mosquitoes
  - VDH Zika Virus Testing Approval Form (if testing is approved) (5/19/16)
  - VDH Zika Virus Disease Case Report Form (For Probable/Confirmed cases, rev. 5/16/16)
  - CSTE Interim Case Definitions: Zika Virus Disease and Zika Virus Congenital Infection (rev. 4/26/16)
  - VDH Zika Virus Disease Case Definition Algorithm (rev. 5/12/16)
  - VDH Testing Algorithm (rev. 6/10/16)
  - DCLS Instructions for Lab Testing
  - CDC Additional Information on Laboratory Testing for Zika, Chikungunya and Dengue viruses
  - VDH Interpretation of Zika Lab Result Scenarios For Clinicians
  - VDH Interpretation of Zika Lab Result Scenarios For Public Health (7/15/16)
  - Zika MAC-ELISA: Fact sheet for patients (rev. 6/29/16)
  - Zika MAC-ELISA: Fact sheet for pregnant women (rev. 6/29/16)
  - Zika MAC-ELISA: Fact sheet for healthcare providers (rev. 6/29/16)
  - Zika Trioplex RT-PCR: Fact sheet for patients
  - Zika Trioplex RT-PCR: Fact sheet for pregnant women
  - Zika Trioplex RT-PCR: Fact sheet for healthcare providers
  - Focus (Quest Diagnostics) Zika virus RT-PCR testing materials
  - Checklist for LHD Investigating Zika Virus Disease (rev. 7/14/16)
  - VDH Chikungunya/Dengue/Zika Cheat Sheet (rev. 2/8/16)
  - Instructions for VEDSS Data Entry: Zika virus disease

Talking Points and Slides
- CDC Key Messages (rev. 8/2/16)
- VDH Talking Points (rev. 8/3/16)
- VDH Zika Slides (rev. 8/3/16)
- CDC COCA Call (1/26/16)
- CDC COCA Call (4/12/16)
- CDC: Information for Clinicians Slide Set (6/13/16)
- VDH Zika Literature Review (rev. 7/13/16)

Mosquito Response
- Appendix C: Virginia Mosquito Response Plan for Zika Virus (rev. 6/29/16)
- Mosquito Surveillance Screening Form (rev. 7/8/16)
- Mosquito Surveillance and Control Algorithms (rev. 7/12/16)
Mosquito Surveillance and Control Action Checklist (rev. 7/15/16)
Mosquito Surveillance Actions at Zika Patient Homes

U.S. Zika Pregnancy Registry
CDC Fact Sheet for Health Departments
VDH Procedures for the U.S. Pregnancy Registry (rev. 5/20/16)
Template Letter from LHD to HCP about Registry
VDH/CDC Pregnancy Registry Form: Maternal Health History (rev. 6/28/16)
VDH/CDC Pregnancy Registry Form: Assessment at Delivery (rev. 6/29/16)
VDH/CDC Pregnancy Registry Form: Infant Follow-up (rev. 6/28/16)
CDC U.S. Zika Pregnancy Registry
VDH Overview and Procedures (rev. 6/22/16)
CDC Study Protocol
CDC Appendix A (letter from LHD in English)
CDC Appendix A (letter from LHD in Spanish)
CDC Appendix B (phone script for LHD in English)
CDC Appendix B (phone script for LHD in Spanish)
CDC Appendix D (consent form for study in English)
CDC Appendix D (consent form for study in Spanish)

Additional Information for Zika
VDH (external website): Zika virus
CDC: Zika Virus
Pan American Health Organization (PAHO): Zika virus infection.
World Health Organization (WHO): Zika virus
Interim CDC Recommendations for Zika Vector Control in the Continental United States (posted March 18, 2016)
- CDC. *Zika Virus: Tools for Healthcare Providers*
- CDC. *Updated Guidance for U.S. Laboratories Testing for Zika Virus Infection*
- CDC. *Zika Virus Response Planning: Interim Guidance for District and School Administrators in the Continental United States and Hawaii*
- OSHA Guidance
  1. OSHA. *Interim Guidance for Protecting Workers from Occupational Exposure to Zika Virus*
  2. OSHA. *Quick Card: Zika Virus Protection for Outdoor Workers*
Figure 6. VDH Procedures for CDC US Pregnancy Registry

The purpose of this document is to summarize VDH processes and procedures for enrolling pregnant women and their infants who reside in Virginia into the US Zika Pregnancy Registry.

Description of the US Zika Pregnancy Registry

Purpose:

- To understand more about Zika virus infection during pregnancy and congenital Zika virus infections, CDC has established the US Zika Pregnancy Registry.
- The data collected will be used to update guide recommendations for clinical care and testing, to plan for services for pregnant women and families affected by Zika virus, and to improve prevention of Zika virus infection during pregnancy.
- For more information, refer to CDC’s US Zika Pregnancy Registry website.

Data collection:
For Virginia residents enrolled in the registry, information will be collected by the local health department where the person resides from the healthcare provider.

- If the healthcare provider is located in another health district, then the health department staff should let the other district know that follow-up is being done with one of their providers. For providers located in another state, the LHD should notify VDH Central Office before contacting the provider; VDH Central Office will notify the other state health department as a courtesy.

- Health department staff will collect information using standardized forms.
  - Regardless of the case classification, the VDH/CDC Pregnancy Registry Forms should be used for persons enrolled in the registry. The specific form to use will depend on the situation. For example, if a pregnant woman with laboratory evidence is first identified and enrolled, then the Maternal Health History should be completed; if an infant is first identified and enrolled, then the infant forms (at delivery and infant follow-up) should be completed.
    - Subsequent data collection at the relevant time points (see below) will be done using the VDH/CDC Pregnancy Registry forms.
    - Standardized forms will include clinical information, testing during pregnancy, results from evaluation and testing conducted at birth, and clinical/developmental information from the infant through the first year of life.
  - If the probable or confirmed Zika case definition is met, the VDH Zika Case Report Form should also be completed. Health department staff will collect information directly from the healthcare provider caring for the enrolled pregnant woman or infant.

Data collection will occur at the following points (as applicable)

- Upon initial identification
- At the end of the second trimester (24 weeks) and at the end of the third trimester (35 weeks)
- At the time of delivery
- For the infant: at 2, 6, 12 months of age

Inclusion Criteria*

All women living in the US (except Puerto Rico where a separate registry is being established) who have been infected with Zika virus during their pregnancy and their infants are eligible for enrollment.

Specifically, eligible persons for enrollment include the following:

- Women in the United States with laboratory evidence of possible Zika virus infection* (regardless of whether they have symptoms) during pregnancy or the periconceptional period (6 weeks prior to last menstrual period to 2 weeks after last menstrual period) and infants born to these women.
- Infants with laboratory evidence of congenital Zika virus infection* (regardless of whether they have symptoms) and their mothers.
- *Refer to Figure 1 for determining eligibility of enrollment into the registry based on laboratory test results.
Laboratory evidence of infection includes detection of Zika RNA by RT-PCR in laboratory or pathology samples or evidence of an immune reaction to a recent virus that is likely to be Zika virus.

Specimen types for testing women include serum, urine and amniotic fluid; specimen types from the infant include cord blood, placenta, fetus or products of conception.

For serology testing and the purposes of determining eligibility for the registry, testing involves Zika IgM and plaque reduction neutralization testing (PRNT). VDH recommends waiting until Zika PRNT results are available. Pregnant women with Zika virus PRNT results ≥10 and their infants are eligible for enrollment; infants with Zika virus PRNT ≥10 and their mothers are eligible for enrollment. Note that these PRNT results may be interpreted as a recent Zika virus infection (Zika virus PRNT ≥10 and dengue/other flavivirus PRNT <10) or a recent flavivirus infection where Zika virus infection could not be ruled-out (Zika virus PRNT ≥10 and dengue/other flavivirus PRNT also ≥10).

Roles and Responsibilities related to the US Zika Pregnancy Registry

Healthcare Provider

- Report any suspected or confirmed cases of Zika virus disease to the LHD
- Coordinate with LHD staff to test persons approved for testing
- Provide information to those eligible for enrollment in the registry
- Coordinate with LHD staff collecting information about persons enrolled in the registry
- Notify LHD staff if the person enrolled in the registry moves or changes healthcare provider

LHD/Health districts

- Approve persons for testing
- Notify healthcare provider of results (if needed)
- Upon identification, collect information from clinician/patient using the VDH Zika Case Report Form
- Coordinate with the healthcare provider to enroll the person into the registry
- Complete data collection forms
- If an adverse outcome is identified, notify Office of Family Health Services
- Upload completed forms to shared drive/SharePoint and notify VDH Office of Family Health Services staff
- Update VEDSS records based on data collected throughout the follow-up of the woman and infant

VDH Central Office

- Division of Environmental Epidemiology (DEE)
  - Report cases to CDC that meet case definition via ArboNet
Division of Surveillance and Investigation (DSI)
  - Track persons approved for testing and test results
  - Notify districts of test results and whether person is eligible for enrollment into the registry
  - Notify OFHS when person eligible for enrollment has been identified
  - Notify other state health departments if providers in their jurisdiction who care for Virginia residents will be contacted by LHD

Office of Family Health Services (OFHS)
  - Consult with VDH’s Institutional Review Board
  - Oversee Virginia residents enrolled in the registry
  - Remind LHD staff about upcoming data collection points
  - Submit collected information to CDC and coordinate with CDC as needed

Division of Consolidated Laboratory Services (DCLS)
  - Conduct or facilitate Zika testing for those approved for testing and provide DCLS/CDC test results.

Steps: Refer to the Figure on the next page

Talking Points
  - Very little is known about the risks of Zika virus infection during pregnancy.
  - Information about the timing, absolute risk, and spectrum of outcomes associated with Zika virus infection during pregnancy is needed to direct public health action related to Zika virus and guide testing, evaluation, and management.
  - Eligible persons in Virginia will be enrolled in the registry as part of public health surveillance.
    - In Virginia, Zika virus disease is a reportable condition in Virginia (under Arboviral infection). Physicians practicing in Virginia who suspect or confirm Zika virus disease should report this condition to the LHD (§ 32.1-36). Physicians may voluntarily report additional information at the request of VDH for special surveillance or other epidemiological studies (§ 32.1-36).
    - The Commissioner or his designee may examine and review medical records upon the request of the Commissioner or his designee during the course of investigation, research or studies of diseases or deaths of public health importance; the practitioner shall not be liable for permitting such examination or review (§ 32.1-40). The Commissioner may share the identity of patients and practitioners with CDC if pertinent to an investigation, research or study; any person to whom such identifies are divulged shall preserve their anonymity (§ 32.1-41).
    - Based on discussions with VDH staff, VDH’s Institutional Review Board (IRB) agreed that the US Zika Pregnancy Registry is consistent with the definition of public health surveillance and allows sharing of patient and practitioner information under Virginia Code (§ 32.1-40). A formal review by the VDH’s IRB was not recommended.
    - Zika virus disease is a nationally notifiable condition which means that VDH
reports cases to CDC. According to CDC, the US pregnancy registry, which is
designed to monitor the frequency of occurrence of adverse birth outcomes in
the context of a public health emergency, does not meet the definition of
research under 45 CFR 46.102(d). CDC is applying for an Assurance of
Confidentiality to assure individuals and institutions that that those conducting
the project will protect the confidentiality of the data collected.

- CDC is requesting the collection of clinical information in identifiable form as
  a public health authority, defined in the Health Insurance Portability and
  Accountability Act (HIPAA) and its implementing regulations, Standards for
  Privacy of Individually Identifiable Health Information (45 CFR § 164.501)
  (“Privacy Rule”), covered entities (e.g., healthcare providers) may disclose
  protected health information without patient authorization to a public health
  authority that is authorized by law to collect or receive such information for the
  purpose of preventing or controlling disease (42 CFR 164.512). As established
  in the HIPAA Privacy Rule (45 CFR 164.522, 164.524, 164.526, and 164.528),
  individuals have the right to request from covered entities (i.e., the healthcare
  provider) disclosing their PHI certain restrictions, access, amendments, and
  accounting of the disclosures of their protected health information.*The
  identity of people in the Registry will be kept private and secured. US Zika
  Pregnancy Registry data will be transferred and stored in accordance with the
  highest security standards for confidential records.

- Persons who are enrolled should be informed about the registry. However, the person’s
  consent is not required for data collection because information will be collected
directly from the healthcare provider by the LHD staff for public health surveillance.
- Information is being collected by district staff from clinicians caring for the pregnant
  women or infants. Information is not being collected directly from the person
  enrolled in the registry.
- VDH wants to limit the potentially identifiable information that will be shared with
  CDC to protect the person’s identity; VDH anticipates providing the mother’s age,
  infant’s date of birth, and county of residence, but will not provide the person’s name,
  healthcare provider name, facility or contact information.
- For persons enrolled,
  - Being in the registry will not cost any money.
  - The person does not need to do any extra paperwork, go to any extra
    appointments, or have any extra tests that would not be routinely
    recommended according to CDC’s guidelines for women infected with Zika
    virus during pregnancy.
- CDC Fact sheets for healthcare providers and patients are available here.
Appendix J – Zika Education Kits

As a tool to facilitate outreach and education about Zika, Virginia Department of Health Central Office procured 10,000 Zika Education Kits to be distributed, by population, to local health districts. These kits will contain five condoms, one small bottle of insect repellant and four educational brochures (2 English, 2 Spanish). The methodology used to allocate the kits was the same methodology used for Title X.

These kits should be distributed, by the district, to OB/GYN providers and other partners as appropriate. This will allow the opportunity to provide education to clinicians who can then educate their patients about Zika prevention.

<table>
<thead>
<tr>
<th>District</th>
<th>Number of Kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandria</td>
<td>386</td>
</tr>
<tr>
<td>Alleghany</td>
<td>166</td>
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<tr>
<td>Arlington</td>
<td>371</td>
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<tr>
<td>Central Shenandoah</td>
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<tr>
<td>Central Virginia</td>
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<tr>
<td>Chesapeake</td>
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<td>Chesterfield</td>
<td>432</td>
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<tr>
<td>Chickahominy</td>
<td>97</td>
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<tr>
<td>Crater</td>
<td>311</td>
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<tr>
<td>Cumberland Plateau</td>
<td>297</td>
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<tr>
<td>Eastern Shore</td>
<td>191</td>
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<tr>
<td>Fairfax</td>
<td>700</td>
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<tr>
<td>Hampton</td>
<td>176</td>
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<tr>
<td>Henrico</td>
<td>193</td>
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<tr>
<td>Lenowisco</td>
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<tr>
<td>Lord Fairfax</td>
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<tr>
<td>Loudoun</td>
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<td>Mount Rogers</td>
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<tr>
<td>New River</td>
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<tr>
<td>Norfolk</td>
<td>214</td>
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<td>Peninsula</td>
<td>399</td>
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<tr>
<td>Piedmont</td>
<td>239</td>
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<td>Pittsylvania-Danville</td>
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<td>Portsmouth</td>
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<td>Prince William</td>
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<td>Rappahannock</td>
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<td>Rappahannock-Rapidan</td>
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<tr>
<td>Richmond City</td>
<td>621</td>
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<tr>
<td>Roanoke</td>
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<tr>
<td>Southside</td>
<td>121</td>
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<tr>
<td>Thomas Jefferson</td>
<td>256</td>
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<tr>
<td>Three Rivers</td>
<td>235</td>
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<tr>
<td>Virginia Beach</td>
<td>164</td>
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<tr>
<td>West Piedmont</td>
<td>164</td>
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<tr>
<td>Western Tidewater</td>
<td>265</td>
</tr>
</tbody>
</table>

Total 10,000
Appendix K – VDH Emergency Order Finding Imminent Danger to the Public Health and Requiring Corrective Action

Commonwealth of Virginia
Virginia Department of Health

Order Finding Imminent Danger to the Public Health
And
Requiring Corrective Action

AUTHORITY

This Order is issued pursuant to the authority given to the Board of Health by Code of Virginia § 32.1-13 to meet any emergency and suppress nuisances dangerous to the public health and the authority given to the Board of Health by Code of Virginia § 32.1-42 to meet any emergency or to prevent a potential emergency caused by a disease dangerous to public health, the State Health Commissioner’s (“Commissioner”) authority to act for the Board of Health when it is not in session (Code of Virginia § 32.1-20), and the direction in Code of Virginia § 32.1-2 that the Board of Health and Commissioner shall “abate hazards and nuisances” affecting health and the environment.

FINDINGS

The Commissioner finds that an emergency exists in the [DEFINE ZIKA TRANSMISSION AREA] of [LOCALITY] regarding the health and safety of its residents.

The World Health Organization declared a Public Health Emergency of International Concern related to the Zika virus on February 1, 2016.

The Zika virus is transmitted to people primarily through the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). Aedes albopictus are the most common nuisance mosquito in Virginia and are present and common in every jurisdiction in the state. Although small, isolated populations of Ae. aegypti are occasionally discovered in Virginia, they are so uncommon as to be an insignificant risk factor as vectors. Therefore, most mosquito surveillance and control efforts will be targeted on Aedes albopictus.

The Zika virus is associated with cases of microcephaly and other neurological deformities in developing human fetuses and with neurological disorders, including encephalitis or Guillain-Barre syndrome, or sometimes fatal blood disorders (e.g., severe thrombocytopenia syndrome) in infected persons. Instances of microcephaly and neurological disorders in infants are caused by Zika infections in utero as a result of the mother being bitten by an infected mosquito. Although primarily transmitted to people by infected mosquitoes, the Zika virus can also be transmitted between people through sexual contact.

The Virginia Department of Health confirmed XX locally-transmitted cases of the Zika virus in Virginia in the [DEFINE ZIKA TRANSMISSION AREA] of [LOCALITY], and

Specific properties located in the [DEFINE ZIKA TRANSMISSION AREA] of [LOCALITY] are likely to harbor mosquitoes infected with the Zika virus, creating the need to enter and inspect the property. This is due to the fact that [e.g. THE PROPERTY’S DISTANCE FROM INFECTED PERSONS, IDENTIFICATION OF LIKELY
MOSQUITO HABITATS, SURVEILLANCE CONDUCTED FROM RIGHT OF WAY, FLYING DISTANCES OF THE SUSPECTED MOSQUITO BREED, ETC.

It is necessary and appropriate to take action to ensure that the Zika virus remains controlled, and that residents of Virginia remain safe and healthy.

CORRECTIVE ACTION

Pursuant to the authority granted to the State Health Commissioner, it is so ordered that the property owners or custodians at [INSERT ADDRESSES OF SPECIFIC PROPERTIES WITHIN THE LOCALITY – or could list properties as Schedule A if lengthy] shall take all actions necessary and incidental to the prevention of the spread of the Zika virus, including conducting mosquito surveillance and control activities intended to prevent further transmission of the Zika virus; specifically:

I. Perform property inspection for mosquito habitats and trapping mosquitoes for speciation and arboviral mosquito testing. Upon consent of the owner or custodian of the property, VDH will provide these surveillance activities at no cost to the property owner or custodian. In the event that the owner or custodian of the property conducts their own mosquito surveillance activities in order to comply with this paragraph, they shall provide the results of their surveillance, including [INSERT SPECIFICS], to VDH by [INSERT METHOD ON HOW THE INFORMATION IS TO BE PROVIDED]. VDH shall disseminate educational materials on mosquito prevention methods to assist the owner or custodian in this effort; and

II. Take specific mosquito control actions including, but not limited to, the following: elimination or treatment of mosquito habitats (i.e., dumping and storage or discarding of containers); insecticide use such as the use of larvicides for treatment of larval containers that cannot be dumped; and use of adulticides for adult mosquito control. Upon consent of the owner or custodian of the property, VDH will provide these services at no cost to the property owner or custodian.

PENALTIES

Any person willfully violating or refusing, failing or neglecting to comply with this Order shall be subject to the remedies as set forth in § 32.1-27 of the Code of Virginia. These possible remedies include, but are not limited to, injunctive relief and prosecution for a Class 1 misdemeanor.

A person who refuses to allow the Commissioner or her designee, upon presentation of appropriate credentials, onto property to determine compliance with this Order, including inspection, investigation, evaluation and/or the conducting of tests or taking of samples for testing, shall be subject to the inspection warrant procedure set forth in Code of Virginia § 32.1-25 to compel access to the property by the Commissioner or her designee.

EFFECTIVE DATE

The effective date of this Order is [INSERT DATE]. The Virginia Department of Health will work with officials of [INSERT LOCALITY] to minimize the burden of implementing this Order while assuring that its provisions are in place as expeditiously as possible. This Order shall remain in effect until [INSERT DATE]

Entered this XXth day of [MONTH, YEAR]

Signature: ______________________________________
Marissa J. Levine, MD, MPH, FAAFP
State Health Commissioner
Appendix L – CDC Zika Checklist

Checklist

Jurisdiction name: Commonwealth of Virginia Date of completion:

Instructions for completing the checklist

Jurisdictions that are required to complete and submit the checklist each quarter to their project officer, should print the checklist and handwrite their answers onto a hard copy or complete the checklist electronically.

1. Please indicate by circling or highlighting in the table below the phase in which your jurisdiction is currently engaged, as of the date of completion in the checklist header.

2. Complete the checklist through your current phase. For example, if your jurisdiction is in Phase 1, then the checklist actions for Phase 0 and Phase 1 should be answered. For each numbered action on the checklist, select “Yes” if your jurisdiction has fully completed the action listed. Select “No” if your jurisdiction has not started the action. Select “IP (in-progress)” if the action has been started but has not been fully implemented or completed. Select “NA” if you believe the action is not applicable.

3. Work with your project officer to determine the method (e.g., fax, email, etc.) for returning your completed checklist. Your project officer will then set up a time to discuss your jurisdiction’s progress and whether assistance is needed.

<table>
<thead>
<tr>
<th>Phase Level</th>
<th>Preparedness</th>
<th>Transmission Risk Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>vector present or possible in the state</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mosquito Season</td>
<td><em>Aedes aegypti</em> or <em>Aedes albopictus</em> mosquito biting activity. Introduced travel related cases.</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Limited Local Confirmed Transmission</td>
<td>single, locally-acquired case, or cases clustered in a single household or nearby houses.</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Widespread Local Transmission</td>
<td>Zika virus illnesses with onsets occurring ≥2 weeks but within a 1.5 km diameter</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Widespread Local Multi-County Transmission</td>
<td>Zika virus illnesses with onsets occurring ≥2 weeks in &gt;1 jurisdictional area</td>
<td>15</td>
</tr>
</tbody>
</table>

Please see the Guidance section of this document for more information about actions listed on the checklist. Referenced material is organized by domain for action.

The Checklist is based on information included in the *Top 10 Zika Response Planning Tips: Brief Information for State, Tribal, and Territorial Health Officials*, *CDC Guidelines for Development of State and Local Risk-based Zika Action Plans*, and CDC documents in development.

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1 The checklist is organized by risk category (phase level) and domain for action. Because the Zika virus response is phased, as jurisdictions advance from one phase level to another, actions listed in an earlier phase should be completed in addition to the actions of the current phase. The checklist, therefore, will not repeat actions that have been recommended to be implemented in an earlier phase. A gap arises when an action from previous or current phase is not completed.
### PREPAREDNESS (Zika Virus, Phase 0)

**Operations & Planning**

1. Conduct a Zika virus preparedness and response planning workshop with relevant response partners.

2. Review legal authorities that support actions that improve public health (e.g., vector control spraying on private property, case monitoring, case isolation).

3. Review administrative preparedness to ensure emergency rapid hiring, contracting processes and interjurisdictional compacts/agreements are in place.

4. Develop a Zika virus readiness, response and recovery plan that contains mission areas and associated activities intended to reduce transmission (especially during pregnancy), and contain community spread while awaiting effective vaccine and other countermeasures. Consider including:
   - **Epidemiology and Surveillance**
     - Assess targeted intervention areas in the jurisdiction by mapping at-risk populations (travel to/from endemic countries, households lacking air conditioning or screens, high pregnancy rates, low safe sex practice rates, and *Aedes aegypti* and *Aedes albopictus*).
   - **Public Health Laboratory aspects**
   - **Patient Care and Management**
     - Assess medical infrastructure, including availability of medical specialists and diagnostic and treatment capacity, to respond to an increase in birth defects among pregnant women infected with Zika virus and neurologic disorders, including GBS, among persons infected with Zika virus.
     - Assess if projected needs (medical and support) for families with a child with microcephaly or another major birth defect have been assessed and planned for, and if there is a system in place with the capacity to adequately address those needs.
   - **Vector Surveillance and Control.** Assess options for:
     - Reduction of vector habitat/potential breeding sites
     - Community clean-up efforts
     - Environmental services
   - **Non-Pharmaceutical Intervention, considering:**
     - Home isolation
     - Active Monitoring
     - Prevention of sexual transmission of Zika virus
   - **Operations Coordination**
     - Identify a senior representative or functional role that will serve as point of contact for CDC and coordinate the jurisdiction’s Zika virus response efforts.

---

**Completed?**

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<table>
<thead>
<tr>
<th>Operations &amp; Planning</th>
<th>Completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>
(Name/role: ______________________)

- Pre-identify Incident Management staff members
  - Public Information
    - Campaigns regarding protective measures
  - Training and Education
    - Clinician Outreach and Education
    - Reduction of unintended (i.e., avoiding or delaying) pregnancies among women of reproductive age
  - Worker Safety

5. Incorporate planning for the transition from response to recovery into Zika virus preparedness and operational plans.

6. During steady-state planning and as a part of post-response transition planning, facilitate the identification, coordination and delivery of assistance needed to supplement longer term public health Zika virus recovery planning, resources, and efforts.

**Communication/Community Education**

7. Conduct rapid assessment (e.g., focus groups) of existing messaging and communications activities (e.g., web-based, social media) related to prevention of mosquito-borne diseases (e.g., Zika, chikungunya, dengue) to identify gaps and/or misconceptions in communication and understanding of Zika virus infections that could lead to birth defects or neurologic disorders. This will inform the development of focused risk communications for pregnant women, travelers, healthcare providers and the public to:
   - Encourage risk-reduction behaviors.
   - Improve prevention measures taken to protect pregnant women and other at-risk populations.

8. Develop public health communications messages, products, and programs with key partners and stakeholders to harmonize response for people traveling to or living in areas of higher risk of Zika virus transmission.
   - Identify primary communications outlets for areas of high risk populations (e.g., radio, television) and potential for using those channels to communicate messaging.
   - Use the CDC Joint Information Center (JIC) key messages document, CDC Zika website, and other CDC resources, along with local resources, as needed, to prepare messaging materials.
   - Work with CDC’s JIC on development of printed, radio, and visual materials as needed.

9. Ensure training and educational material is appropriately augmented with information on state or territorial requirements and distributed to healthcare providers of pregnant women or women trying to become pregnant in order to:
   - Reach preconception care practices that can help reduce the risk of sexual transmission of Zika virus and reduce unintended pregnancies through provision of effective contraception.
▪ Advise patients, especially pregnant women and women trying to become pregnant, on how to reduce mosquito exposure and how to prevent sexual transmission of Zika virus during pregnancy.
▪ Educate pregnant women about modes of transmission (mother/infant), the symptoms of Zika virus infection, the possible association with adverse pregnancy outcomes and that Zika virus causes microcephaly and other serious brain defects.
▪ Ensure obstetric providers increase screening for symptoms of Zika virus among women possibly exposed to Zika virus and adhere to the CDC guidelines for monitoring pregnant women with confirmed or suspected Zika virus infection.
▪ Ensure that obstetric providers understand the critical need for information from the U.S. Zika Pregnancy Registry for updating recommendations for clinical care, planning for services for pregnant women and families affected by Zika virus, and improving prevention of Zika virus infection during pregnancy.
▪ Ensure that obstetric providers identify and report pregnant women with laboratory evidence of Zika virus infection to their health department.
▪ Ensure that obstetric providers understand that they are asked to participate in the U.S. Zika Pregnancy Registry by reporting pertinent clinical information about pregnant women; providing the information to their health departments or directly to CDC Registry staff if asked to do so by local health officials; notifying health department staff or CDC Registry staff of pregnancy outcomes (e.g., live birth, spontaneous abortion, termination of pregnancy).
▪ Ensure obstetric providers are familiar with CDC guidelines, stay aware of when testing is indicated, how to arrange for testing, and can evaluate and implement follow-up of women with possible Zika virus infection in accordance with these guidelines.
▪ Ensure that obstetric providers are aware of CDC’s clinical consultation service and understand that they should coordinate with their state and local health department.

10. Ensure training and educational material is appropriately augmented with information on jurisdictional requirements and distribute to healthcare providers of infants/children who may have been prenatally or perinatally exposed to Zika virus to:
▪ Raise awareness among pediatric providers that an infant’s exposure to Zika virus may not be apparent if the mother had mild or asymptomatic Zika virus infection or did not get tested for Zika virus during pregnancy.
▪ Ensure that pediatric providers identify and report suspected congenital Zika virus exposure to their health department.
▪ Ensure that pediatric providers understand that they are asked to participate in the U.S. Zika Pregnancy Registry by reporting pertinent clinical information about prenatally or perinatally exposed infants;
providing the information to their health departments or directly to CDC Registry staff if asked to do so by local health officials; notifying health department staff or CDC Registry staff of adverse events.

- Ensure that pediatric providers understand the critical need for information from the U.S. Zika Pregnancy Registry for updating recommendations for clinical care, planning for services for pregnant women and families affected by Zika virus, and improving prevention of Zika virus infection during pregnancy.
- Ensure pediatric providers are familiar with CDC guidelines, stay aware of when testing is indicated, how to arrange for testing, and can evaluate and implement follow-up of infants and children with possible Zika virus infection.
- Ensure that pediatric providers are aware of CDC’s clinical consultation service and understand that they should coordinate with their state and local health department.

| 11. | Identify local vendors for translation (as necessary), printing, signage, audiovisual/public service announcement development and determine what is required (funding, contract approval) to use these resources for message and product dissemination. |
| 12. | Educate the public and clinicians so they are aware of the risks of sexual transmission of Zika virus. Promote abstinence or consistent condom use and availability among the following populations:
  - Men who have traveled to or reside in areas with active Zika virus transmission and their pregnant sexual partners or sexual partners attempting to become pregnant.
  - Others who are concerned about sexual transmission. |
| 13. | Identify the most appropriate and functional channels to share information with healthcare providers (e.g., Health Alert Network, webinars, professional organizations, etc.). |
| 14. | Monitor provision of updates including clinical care guidelines through various methods (e.g., the CDC website, CDC Clinician Outreach Communication Activity (COCA), Health Alert Networks (HANs)) and determine if the material will require modification to meet needs or change protocols within the jurisdiction (e.g., modifications to Zika Prevention Kits [ZPKs] or laboratory testing protocols). |
| 15. | Communicate with healthcare providers and pathologists about which specimens to collect and how to submit specimens for testing through the state health department. |
| 16. | Ensure clinicians, laboratorians, and infection control practitioners are aware that, as an arboviral disease, Zika virus is a nationally notifiable condition in the National Notifiable Disease Surveillance System. |
| 17. | Publicize travel notices designed to inform travelers and clinicians about the risks for contracting Zika virus infection related to specific destinations and provide prevention recommendations. |
| 18. | Update scripts for state call centers to include Zika virus messaging. |
Vector Control

19. Develop a State action plan. Each State with indigenous vector populations is urged to have a readily referenced plan that covers all aspects of preparing for and responding to potential and real transmission of Zika virus. Vector control components of the response should be integrated into this plan and include:

1) An explicit procedure for the rapid relay of positive laboratory results from State departments of health to the relevant mosquito control unit
2) Procedures for systematic collection of vector distribution and insecticide resistance data. Data should be reported to CDC, which maintains a nationwide map. [CDC has published a nationwide, county-level map of Aedes distribution. It is developing a user-friendly, web-based reporting system update to the map. It also provides advice on trapping methods and resistance testing.]
3) Vector control procedures for responding to each level of risk including preemptive source reduction campaigns in areas considered high risk.
4) Prescribe a control scheme that takes into consideration the results of insecticide sensitivity testing. Because the sensitivities will shift over time with selective pressure, this should be revised often.

Note: [CDC has developed and updates detailed technical advice on vector surveillance, testing and control to vector control professionals at the Zika virus website: at http://www.cdc.gov/zika/public-health-partners/vector-control-us.html]

20. Determine high risk locations and take precautionary measures. All areas endemic for Aedes aegypti or Ae. albopictus are at risk, however, larger population areas are at more risk than rural areas because they are more likely to harbor the vector, have houses at greater density (the vectors have short flight ranges), and receive more international travelers.

1) States that have records of dengue transmission should consider those regions at highest risk for Zika virus.
2) Campaigns to reduce the sources of mosquito populations (e.g., discarded tires, trash) in especially vulnerable areas should be implemented before mosquito season.
3) Augment outreach to mosquito control districts and the public in risk areas.

NOTE: [CDC is developing a risk model based on records, population density, international traffic, and environmental factors to predict areas at county level with highest transmission potential.]

21. Identify existing state, local, and national mosquito control resources.

1) Identify state and local mosquito control professionals who can respond to transmission. Create a listserv or other means of rapidly keeping them informed.
2) Assess the readiness of those control operations in the highest risk areas.
a. Train personnel to identify the vector species, conduct vector surveillance, and insecticide resistance testing, as well as the proper handling of pesticides.
b. Catalog the resources available to vector control operators including pesticides, truck mounted ultralow volume fumigation units, aerial units, etc.
c. Determine if the State has the capacity to test for virus in pooled mosquitoes to support epidemiological evaluation in the event of transmission.
d. [CDC has contracted with the American Mosquito Control Association to conduct training on these topics beginning in June 2016.]
e. [CDC has published funding opportunity announcements in the Epidemiology and Laboratory Cooperative Agreement (ELC) to support State efforts to strengthen State readiness.]

NOTE: [CDC response teams (CERT) include vector control specialists who can deploy with equipment and supplies to survey for the vector, monitor density during control activities and test for insecticide resistance.]

Surveillance

22. Determine the group(s) within the state health department which are responsible for collecting the following surveillance data:
   ▪ Prenatal data on pregnant women
   ▪ Birth data on babies born to Zika virus-infected pregnant women
   ▪ Follow-up data collection on babies born to Zika virus-infected pregnant women

23. Ensure investigating officials and clinicians are using the latest case definitions developed by the Council of State and Territorial Epidemiologists, CSTE.

24. Ensure coordination between vector control and human surveillance activities.

25. Determine if systems and procedures, while working with jurisdictional partners, are in place to identify potential or confirmed Zika virus infections and related health outcomes to include:
   ▪ How healthcare professionals report data from symptomatic infections to health departments.
   ▪ How data are incorporated into ArboNET through the web interface or the National Electronic Disease Surveillance System, NEDSS, using HL7 messaging.
   ▪ What cases or threshold will prompt an epidemiologic investigation (If syndromic surveillance programs involve the abstraction of information from health records, detail how to share information with sections conducting other Zika virus-related surveillance).
   ▪ How to report positive tests for Zika virus in both humans and mosquitoes through ArboNET.
- What coordination will occur between certain sections if the reporting system identifies:
  - A potential infection in a pregnant woman
  - Virus-associated reproductive and congenital outcomes, including microcephaly and other central nervous system abnormalities in developing fetuses and newborns
  - Virus-associated Guillain-Barré syndrome or other neurologic illnesses
  - Virus-associated blood transfusions
  - Potential sexual transmission of the virus

26. Ensure adequate number of investigators for prioritizing investigations of Zika virus infections that may be:
   - travel-associated
   - sexually acquired
   - transfusion-related

27. States should establish a baseline prevalence of microcephaly through the use of existing birth defects registries or medical records abstractions in order to detect an increase in this birth defect potentially due to effects of Zika virus infection.

28. Engage with CDC on the U.S. Zika Pregnancy Registry to:
   - Develop a plan for active monitoring of pregnant women with suspected or confirmed Zika virus infection and ensure healthcare providers are aware of the state’s plan.
   - Complete follow-up on children (up to at least one year of age) who are born to Zika virus-infected mothers.
   - Establish plans to ensure that these data populate the U.S. Zika Pregnancy Registry and that birth defects are appropriately reported to the state birth defects surveillance program.

**Laboratory Testing**

29. Collaborate with your jurisdiction’s epidemiologist to coordinate sample referral and testing.

30. Obtain most current Zika virus testing algorithm from CDC and make it available to lab personnel, public health officials and healthcare providers (e.g. sentinel clinical laboratories).

31. Determine which laboratories, servicing their jurisdictions, are capable of conducting IgM antibody ELISA and molecular (RT-PCR) tests for Zika virus and:
   - Assess the routine and surge capacity of these labs to aid in setting priorities for specimen testing.
   - In collaboration with your jurisdiction’s epidemiologist, provide clear instructions to healthcare providers on how to submit specimens.
   - Seek agreements with CDC or neighboring jurisdictions to conduct testing if the capability is not available in the jurisdiction or surge testing in the case of extremely high testing volumes.

32. Establish a point of contact for healthcare providers who have questions regarding testing services and the interpretation of results of tests for Zika virus infection.
### Pregnant Women Outreach

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>33.</td>
<td>Identify resources that could be used to support interventions (e.g., products to include in Zika Prevention Kits (ZPKs) for pregnant women, and resources for communications campaigns).</td>
</tr>
<tr>
<td>34.</td>
<td>Develop a plan for distributing Zika Prevention Kits (ZPK) or ZPK material to pregnant women.</td>
</tr>
<tr>
<td>35.</td>
<td>Ensure training and educational materials from CDC are appropriately updated with information for pregnant women to:</td>
</tr>
<tr>
<td></td>
<td>• Educate about modes of transmission (sexual and mother/infant), the symptoms of Zika virus infection, the possible association with adverse pregnancy outcomes and that Zika virus causes microcephaly and other serious brain defects.</td>
</tr>
<tr>
<td></td>
<td>• Reduce mosquito exposure and how to prevent sexual transmission of Zika virus during pregnancy.</td>
</tr>
</tbody>
</table>

### Blood Safety

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>37.</td>
<td>Work with partners to ensure blood centers in areas without active vector-borne transmission of Zika virus follow FDA guidance for deferring blood donations for people who have a recent travel history to an affected area.</td>
</tr>
</tbody>
</table>
MOSQUITO SEASON (Phase 1)

**Operations & Planning | Continue actions from Phase 0**

1. Organize and conduct regular meetings between the pre-identified Incident Manager and state or local vector preparedness and response partners to discuss plan and progress.

2. Reduce barriers to access and deploy strategies to help women and men at risk for unintended (avoiding or delaying) pregnancies choose and use appropriate contraceptive methods correctly and consistently.

3. Develop a plan for the supply and distribution of condoms
   - Determine the potential volume of condoms that would be needed in the jurisdictions if local Zika transmission were present
   - Assess present supplies, availability, and accessibility of condoms
   - Prepare plans to procure and distribute adequate supplemental supplies of condoms to fulfill any unmet need.

**Communication/Community Education | Continue actions from Phase 0**

4. Initiate community outreach for messaging around:
   - Personal protection
   - Residential source reduction
   - Reduce transmission risk from travelers coming from areas experiencing Zika virus outbreaks.
     - Actively take steps to prevent mosquito bites for at least 3 weeks to reduce the risk of spread to local mosquito populations.
     - Avoid sexual transmission by abstaining from sexual contact or using condoms correctly and consistently.

5. Prepare for possible communications needs in the event the patient is positive (e.g., determine who will be the spokesperson, talking points to alert the general public, identify and prepare local spokespeople).

**Vector Control | Continue actions from Phase 0**

6. Survey and monitor vector populations
   1) Determine the presence of the vectors. Systematically monitor their presence and relative density. More attention can be given to areas frequently positive. Caught mosquitoes must be identified to species.
      a. For Aedes adults the a cost effective and representative sampling technique is to place lethal ovitraps at set intervals in a geographic pattern that allows representation of the entire area believed to be at risk. There are a number of such traps available but the most important consideration is that results are
comparable. Traps can be rotated throughout the area to conserve resources but each area should be sampled periodically during the season.
b. Systematic searches for immature stages in water collection containers near human habitation should be done often and over as large an area as possible. Areas with high number of breeding areas should be targeted for source reduction clean-up efforts.

2) Determine insecticide sensitivity. The bottle assay is inexpensive, simple and gives results for the major active agents (e.g., organophosphates, pyrethrroids) within 24 hours. Typically adult mosquitoes reared from field collected immature stages are used. It is advisable to test samples from a variety of locations but once each season should be sufficient. [CDC posts detailed advice on insecticide sensitivity testing on the Zika virus website.]

7. Community outreach. It is important to leverage control efforts with community participation through the use of communication campaigns, including public service announcements and school programs.
1) Personal protection and risk avoidance measures such as topical repellent and window screens should be promoted.
2) Community mobilization to reduce mosquito breeding places can significantly reduce or eliminate vector populations

8. Travel-related cases. Autochthonous transmission will originate with viremic travelers, therefore it is important that PCR or IgM confirmed infections in those with a recent history of travel to an epidemic or endemic country (or sexual contact with someone who has traveled) be rapidly followed up, including an assessment of vectors in the vicinity of the case house. There is evidence, however, that Zika virus titers remain sufficient to infect mosquitoes for <7 days post onset of symptoms, so travelers who entered the U.S. more than a week after the onset of symptoms should pose no threat of transmission. Areas with only indigenous Ae. albopictus at low density might elect not to conduct vector control around introduced cases.
1) State health laboratory notifies appropriate vector control district of case location. Patient confidentiality is important and vector control operations should be careful not to direct public attention to the case.
2) Evaluate vector status in vicinity of case. Initiation of vector control measures do not require validation from mosquito surveillance if there is reason to believe they are present. If temperatures are not conducive to mosquito propagation the State might elect not to implement vector control.
a. No evidence of adult or immature Aedes within at least 150 m radius of case: continue human and mosquito surveys for 2 weeks; discontinue if negative.
b. Evidence of vector present: continue perimeter vector control activities until epidemiological surveillance establishes no further cases after 30 days.
i. initiate adulticiding and source reduction within minimum 150 m of case
ii. provide instruction and supplies for personal protection to case household
iii. test for insecticide sensitivity  
3) If additional cases reported, the response escalates to transmission.

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<tr>
<th><strong>Surveillance</strong></th>
<th>Continue actions from Phase 0</th>
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<tr>
<td>9.</td>
<td>Rapidly follow-up suspected cases through laboratory testing. Determine exposure risk and stage of Zika virus spread by:</td>
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<td></td>
<td>▪ Taking a complete patient history; establish lack of travel, no transfusion or tissue transplantation, no sexual exposure to a traveler.</td>
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<td>▪ Assessing patient’s geographic area of risk for exposure (i.e., where were they likely exposed? Home? Elsewhere?).</td>
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<td>10.</td>
<td>When suspect Zika virus infected cases are identified with a travel history or a sexual contact placing them at risk for infection, counsel them to take precautions to avoid exposure to local mosquito populations (stay indoors in screened air conditioned rooms, use of personal repellents, consider mosquito reductions activities around home).</td>
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<tr>
<td>11.</td>
<td>Encourage laboratories and healthcare providers to immediately report results for any positive or equivocal cases.</td>
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<tr>
<th><strong>Laboratory Testing</strong></th>
<th>Continue actions from Phase 0</th>
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<tbody>
<tr>
<td>12.</td>
<td>Confirm patient infection through laboratory testing.</td>
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<td>13.</td>
<td>Ensure public health laboratory is financially and logistically prepared for potential surge in testing and has engaged clinical laboratories, providing guidance on specimen collection, transport, and reporting of results.</td>
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<tr>
<td>14.</td>
<td>Ensure state or local public health laboratory immediately reports results to CDC for any positive or equivocal cases.</td>
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<tr>
<th><strong>Pregnant Women Outreach</strong></th>
<th>Continue actions from Phase 0</th>
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<tr>
<td>15.</td>
<td>Develop a plan to provide window screening kits to the homes of pregnant women without air conditioning or window screens.</td>
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<tr>
<th><strong>Blood Safety</strong></th>
<th>Continue actions from Phase 0</th>
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<tr>
<td>16.</td>
<td>Work with partners to develop methods for ensuring that blood centers in Zika virus affected areas follow FDA guidance for an active area of transmission, including outsourcing blood if laboratory screening or pathogen reduction is unavailable.</td>
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LIMITED LOCAL TRANSMISSION (Phase 2)

**Operations & Planning** | Continue actions from Phase 0 through Phase 1
---|---
1. Consider activating the jurisdiction’s incident management structure.
2. Determine if there is a need for assistance from a CDC field section (e.g., Epi Aid or rapid response section) to provide on the ground technical, risk communication, vector control and/or logistical support.
3. Assure that access to effective contraceptive methods is available in communities for women who are avoiding or delaying pregnancy.

**Communication/Community Education** | Continue actions from Phase 0 through Phase 1
4. As appropriate, issue press release/media statement and intensify visible activities in the county to increase attention to Zika virus transmission risk and personal protection measures (e.g., flyers, community leaders, and social media).
5. Monitor local news stories and social media postings to determine if information is accurate, identify messaging gaps, and make adjustments to communications as needed.
6. Ensure 24/7 state hotline for inquiries has been established and communicate to the public. Update scripts for state call centers as appropriate.
7. To avoid introducing Zika virus into the local mosquito population, educate suspect cases that they are recommended to stay in air-conditioned/screened accommodations and use personal protective precautions to reduce mosquito bites for at least 1 week to avoid contributing to mosquito-borne Zika virus infections.

**Vector Control** | Continue actions from Phase 0 through Phase 1. The basic elements of response for Phases 2-4 are the same but as the extent of transmission increases the intensity of intervention and scale of resources committed will increase. At wider transmission some methods not practicable for small foci, such as aerial insecticide application, might be incorporated. The availability of vector control resources varies between States.
8. Activation of response
   1) State identifies acute case, or a cluster of cases, with no history of travel or sexual contact with traveler. Epidemiological assessment indicates case could be locally acquired.
   2) State assesses the situation and determines the level of response and areas at immediate risk.
   3) Vector control operatives are mobilized, guided by area risk assessment.
   4) Rapid, accurate information flow between State epidemiologist, State laboratory and local mosquito control units are coordinated
5) Communication campaign with mosquito prevention advice increased.

NOTE: [CDC activates a CERT, if requested, which includes vector control specialists]

9. Immediate vector control actions. Although some activities, such as establishing an insecticide sensitivity profile, might have already been done, once transmission has been identified these should be repeated to verify.
   1) Establish limits of affected area. It will be unclear at the outset how large the area of transmission is. Vector control teams and epidemiologists should work closely together to delineate an initial area for control efforts. Although an intervention radius of 150 m should be sufficient to prevent transmission from individual cases, the occurrence of many cases might make it prudent to cordon entire neighborhoods.
   2) Determine vector distribution. Although the general distribution of \textit{Aedes} in the area will be known, information relevant to the case foci should be determined. A decrease in vector density is also a measure of the efficacy of treatment. Ovitrap and immature surveys should be used. Commencement of control operations should not be delayed for distribution results.
   3) Implement a control plan in concordance with the State plan. Insecticide selection must be based on sensitivity profiles.
      a. Source reduction and insecticide applications within minimum 150 m of case houses.
      b. Community-wide source reduction campaigns instituted coupled with extensive public service communications emphasizing personal protection and yard clean-up.
      c. Area treatment with truck-mounted ULV applicators or aerial delivery should be based on local assessment of spatial risk.
      d. Interior residual spraying of houses might be made available to those in affected area if allowed in State plan.
   4) Request for additional assistance. [CDC has a task order in place for supporting States’ needs during a Zika virus epidemic once the need is verified.]

10. Follow up and stand-down
   1) The cessation of vector control activities will depend on epidemiological information that no further cases have occurred for 6 weeks after the date of onset of the last known case, the duration it is possible for an \textit{Aedes} feeding on that case to continue to transmit.
   2) As a precaution the State might choose to continue moderate control efforts beyond the 6 week buffer until the end of mosquito season.

\textbf{Surveillance} | Continue actions from Phase 0 through Phase 1
11. Ensure case reporting conducted through ArboNET and if pregnant woman that linkage to U.S. Zika Pregnancy Registry occurs.
   ▪ Follow pregnant women to monitor and follow-up of birth outcomes, including their exposed babies’ health. Additional follow-up assistance is available from the U.S. Zika Pregnancy Registry staff.

12. Determine if cases are likely to represent a single transmission chain or separate occurrences.

13. Expand surveillance for human cases in the immediate vicinity (150-yard radius around home or other likely sites of exposure), including conducting household and door-to-door surveillance for clinically compatible cases.

14. Intensify local surveillance for human cases (local clinician outreach, syndromic surveillance in nearby hospitals, etc.).

**Laboratory Testing** | Continue actions from Phase 0 through Phase 1
---
15. Ensure that funding mechanism is triggered to allow for increased laboratory capacity as testing volumes reach increased threshold (reagents, staff, space, equipment, shipment of specimens to overflow laboratories, etc.)

**Pregnant Women Outreach** | Continue actions from Phase 0 through Phase 1
---
16. Deploy targeted communications, surveillance, and monitoring programs for pregnant women in the county/jurisdiction.


18. Coordinate with local blood collection agencies to develop a plan for notification of health departments of Zika virus presumptively viremic blood donors and for health department investigation and follow-up.

**Blood Safety** | Continue actions from Phase 0 through Phase 1
---
19. Ensure availability/accessibility of information on local Zika virus transmission for use by blood collection organizations in implementing measures to ensure blood safety.

20. Coordinate health department processes and procedures for follow-up with persons identified as a Zika positive blood donor during a blood donation screening process.

21. Confirm notification guidance between blood centers and state health departments of individuals positive for Zika Virus is being conducted.
WIDESPREAD LOCAL TRANSMISSION (Zika, Phase 3)

**Operations & Planning** | Continue actions from Phase 0 through Phase 2
---|---
1. Determine the geographic boundaries that will be used for aggressive response efforts (county/jurisdiction, health department coverage area, zip code, etc.).
2. In order to implement appropriate blood safety actions, designate the county/jurisdiction as an area of “active Zika transmission.”
3. Notify CDC of current widespread local Zika virus transmission (Phase 3); call (770)-488-7100.
4. Incident Manager should provide regular situation updates to keep public and partners informed of evolving situation.

**Communication/Community Education** | Continue actions from Phase 0 through Phase 2
---|---
5. Intensify countywide (or jurisdiction-wide) outreach (newspaper, radio, social media, and call centers).
6. Modify messaging as needed.
   ▪ Begin translating the information collected from surveillance to craft communications about the impact of Zika virus infections on pregnant women and their families and persons experiencing other Zika virus-associated conditions.
   ▪ Initiate testing of asymptomatic pregnant women.
7. Deploy communications developed in Preparation (Phase 0) for pregnant women and their obstetric and pediatric providers in the local areas of transmission.
8. Institute community outreach to advise men in the county to use condoms or abstain from sexual contact with pregnant women or women of reproductive age wishing to avoid or delay pregnancy.
9. Issue state-wide guidance advising pregnant women to consider postponing travel to the county/jurisdiction.

**Vector Control** | Continue actions from Phase 0 through Phase 2
---|---
10. Vector control efforts should align with state, tribal, and local government decisions regarding boundaries for declaring an area as a site of “active Zika transmission.” At this phase, officials should intensify and expand vector control efforts within the areas of active transmission.
11. In addition to continuing to target case-patient homes and the surrounding vicinity, area-wide treatments with larvicides and adulticides using application methods appropriate for the scale of the treatment area should be considered. Control plans should be tailored to local needs, and might include ground application, aerial spraying (for areas >2,000 acres), or a combination of the two, and should include both adult and larval mosquito control methods, repeating applications as necessary to achieve adequate control.
12. Monitor for effectiveness of treatments through trapping and retreat if mosquito numbers begin to increase again.

**Surveillance** | Continue actions from Phase 0 through Phase 2
---
13. Intensify countywide (or jurisdiction-wide) surveillance for human cases (consider clinician outreach, syndromic surveillance in hospitals, etc.).
14. Expand surveillance, and monitoring programs (as developed in Phase 0) for pregnant women in the local areas of transmission.
15. Consider retrospective enhanced surveillance in health facilities to establish the earliest known date of local human infection for future counseling/testing of asymptomatic pregnant women.

**Laboratory Testing** | Continue actions from Phase 0 through Phase 2
---
16. Ensure that surge reagents and pre-identified laboratory testing staff are in place.

**Pregnant Women Outreach** | Continue actions from Phase 0 through Phase 2
---
17. Advise pregnant women to consider postponing travel to the county/jurisdiction.
18. Advise pregnant women that their male sexual partners should use condoms or abstain from sexual contact.
19. Implement intervention plans for high risk populations (pregnant women). Options to consider include:
   - mosquito-proofing homes through installation of screens
   - provision of air-conditioning, if necessary
   - household vector control
   - distribution of condoms
   - distribution of Zika prevention kits (ZPKs).

**Blood Safety** | Continue Zika from Phase 0 through Phase 2
---
20. Blood centers with collections in county/jurisdiction should follow FDA guidance for an area of active transmission, including outsourcing blood if laboratory screening or pathogen reduction is unavailable.
21. Blood centers in other areas and states should follow FDA guidance for deferring blood donations for people who have a recent travel history to this county/jurisdiction.
22. Implement notification protocol between blood centers and state health departments of individuals positive for Zika Virus.
23. Identify and disseminate health department processes and procedures for follow-up with persons identified as a Zika positive blood donor during a blood donation screening process.
WIDESPREAD LOCAL MULTI-COUNTY TRANSMISSION (Phase 4)

Operations & Planning

Continue actions from Phase 0 through Phase 3

Completed?

1. Expand response activities regionally or state-wide.
2. Expand strategies to prevent unintended pregnancy, including removing barriers to accessing effective contraceptives (e.g., ensuring healthcare providers in diverse areas are trained to insert and remove long acting reversible contraceptives and have ready access to these methods) and helping women and men at risk for unintended pregnancy choose appropriate contraceptive methods and use them correctly and consistently to prevent pregnancy.
3. Begin planning for the post-Zika virus response phase.
   • Examine the capability and capacity for the jurisdiction to support post-Zika virus response public health, behavioral health and medical services requirements.
   • Coordinate strategies to address Zika virus recovery issues for general public health, behavioral health, maternal and child health, and social services.
   • Establish post-response/recovery communication and information-sharing forum(s) for Health and Social Services stakeholders within the State and/or jurisdiction.

Communication/Community Education

Continue actions from Phase 0 through Phase 3

Vector Control

Continue actions from Phase 0 through Phase 3

5. Expand vector control efforts for regional or state coverage.

Surveillance

Continue actions from Phase 0 through Phase 3

Laboratory Testing

Continue actions from Phase 0 through Phase 3

Pregnant Women Outreach

Continue actions from Phase 0 through Phase 3

8. Expand case management for pregnant women regionally or state-wide.
Blood Safety | Continue actions from Phase 0 through Phase 3
9. Expand blood safety management activities regionally or state-wide.
Appendix M – Zika Recovery Checklist

The Office of the Assistant Secretary for Preparedness and Response (ASPR) has been asked to track the nation’s progress in preparing for Zika. The below questions can serve as a checklist when developing recovery measures.

Assessed healthcare resources:

Medical Supplies: Does your facility/locality possess adequate medical supplies to 1) recognize, 2) diagnose, and 3) treat babies born with microcephaly or other birth defects?

Staff: Does your facility/locality possess adequate staff to provide healthcare services needed to 1) recognize, 2) diagnose, 3) treat, and 4) provide support to high risk pregnancies and babies born with microcephaly or other birth defects?

Space: Is there adequate staff to treat babies with microcephaly or other birth defects, e.g., NICU, ILN, pediatric beds?

Payment/Funding: How are microcephaly or other birth defects paid for?

Assessed social service resources:

Coordinated Care: Access to coordinated comprehensive care within a medical home?

Financing: Access to adequate private and/or public insurance?

Screening: Early or continuous screening for special health needs?

Integration of Services: Organization of community services for ease of use?

Translation: Youth transition to adult health care, work, and independence?