1) **Purpose:**
The purpose of this document is to provide guidance on training and work practices recommended to minimize or eliminate the exposure of city workers to vector-borne diseases such as West Nile virus, Zika virus, chikungunya virus, dengue, Lyme disease, Rocky Mountain Spotted Fever, babesiosis, and anaplasmosis. (Information on these vector-borne diseases can be found in Section 12 of this document.)

2) **Scope**
This guidance applies to city workers that due to their job tasks may have an increased potential for contact with vectors and vector-borne diseases. The potential for contact with vectors is increased when workers work outdoors in areas where vectors live and breed and during times when vectors are active. The types of job tasks with increased potential for contact with vectors include but are not limited to: working in parks, beach and marsh areas; working in overgrown right-of-way areas; performing mosquito control activities; clearing empty lots; performing grounds maintenance activities, gardening, etc.

3) **Definitions and Acronyms**
   a) CDC - Federal Centers for Disease Control
   b) COSH – Citywide Office of Occupational Safety and Health, part of the New York City Department of Citywide Administrative Services (DCAS)
   c) DOHMH – New York City Department of Health and Mental Hygiene
   d) Exposure prevention strategy – a term to refer to the broader plan or strategy or approach aimed at preventing worker exposure to vector-borne disease. The strategy should include the “how to” for identifying at risk workers and providing them with training and equipment to help prevent exposure.
   e) Job Hazard Analysis – a written analysis breaking down each step of a job, identifying hazards associated with the step and the control measures or work practices that should be used to minimize or eliminate the hazard.
   f) OLR – New York City Office of Labor Relations
   g) OSHA/NYS DOL PESH – Federal Occupational Safety and Health Administration and the New York State Department of Labor Public Employee Safety and Health office, responsible for establishing and enforcing worker health and safety regulations.
h) Risk Assessment - one of the first steps an agency should take to identifying workers that may be at risk of contact with vectors due to their job tasks. The risk assessment should be done through a review of job titles, functional areas, and program feedback (ideally a combination of all). The Zika Risk Matrix, attachment 1 to this guidance, should be used to ensure a standard approach to risk assessment across agencies.

i) Vector - The term vector refers to an organism (an insect or a tick in most cases) capable of carrying and transmitting a disease-causing agent from one host to another. The most important vectors with respect to disease transmission are mosquitoes and ticks.

j) WNV – West Nile Virus

4) **Agency Responsibilities**
   
a) COSH – is responsible for coordinating information and training among mayoral agency health and safety coordinators and providing support in implementing this guidance.

b) DOHMH – is responsible for providing current information on local vector-borne diseases and vector control plans including the use of pesticides that could affect outdoor workers.

c) Agencies – Each agency is responsible for:
   
i) Conducting or updating the risk assessment to identify workers at risk of contacting vectors and vector borne-diseases and if there are employees that may have work-related exposure, perform job hazard analyses that include control measures.
   
ii) Developing or updating associated written health and safety policies and procedures as needed (e.g. personal protective equipment, OSHA Hazard Communication Standard 2012 (HCS 2012), New York State Right-to-Know)
   
iii) Developing or updating and conducting employee training; and

iv) Maintaining related training and medical records.

5) **General Procedures**
   
a) Prior to the beginning of vector season, COSH and DOHMH will review this guidance document and the related training materials, update information as needed, and provide the materials to agency health and safety coordinators. Agency health and safety coordinators and/or designee will review the materials; develop exposure prevention plans/strategies or edit their existing strategy if they determine changes are needed.

b) Agency health and safety coordinators and/or designee should also review their worker injury and illness reports from the previous year to help inform their exposure prevention strategies.

c) The exposure prevention strategy should be based on a risk assessment of agency workers.

i) Determine if workers’ tasks create an increased potential for contact with vectors such as mosquitoes and ticks, and the chemicals used for vector control:

   1) Review current information on vector-borne diseases such as local transmission and prevalence

   2) Review current DOHMH vector control information/plan
(3) Identify employee job titles and/or work assignments, and review the Zika (Vector) Risk Matrix attachment 1, to determine if exposure to vector-borne diseases and/or chemicals used for vector control can be reasonably anticipated.

(4) If workers are determined to be at risk, agencies will perform job hazard analyses to break down the job tasks and identify the safe work practices and control measures needed to prevent or minimize exposure. Control measures can include environmental controls (such as removing standing water and overgrown vegetation), administrative controls, engineering controls (screens), and personal protective equipment.

d) If personal protective equipment is identified through the job hazard analysis, purchase and provide the PPE to at risk workers.

e) Provide training as recommended in the training section #8 of this guidance.

6) Safe work practices

a) Clothing/tucking

i) Workers should wear light weight (in warm temperatures), light colored clothing (so that ticks can be seen) that covers exposed skin. The clothing should include long pants, long socks, and long sleeved shirts. If working in an area where ticks may be present, tuck pant legs into light colored socks to prevent ticks from attaching. The proper clothing should help to protect against mosquito bites and prevent ticks from attaching.

ii) Upon leaving the outdoor work area, workers should inspect themselves thoroughly preferably with the help of a buddy and remove any ticks that may have attached to their clothing or skin. Workers should be sure to check their scalp, neck, behind ears, etc.

iii) If workers are required to go into areas expected to have dense mosquito populations, agencies should provide them with hats with mosquito netting to protect the face and neck.

b) Insect repellant (see also Guidance on Insect Repellent Use in Section #12 of this document)

i) Agencies should provide insect repellants containing EPA-registered active ingredients to workers as identified through the risk assessment and job hazard analysis.

ii) When applying insect repellent workers should be instructed to:

   (1) Always follow the manufacturers’ directions on the label.

   (2) Not apply repellent to skin under clothing.

   (3) Not apply repellent to cuts, wounds or irritated skin.

   (4) Not apply aerosol or pump products directly onto the face and instead spray into hands and then rub onto face avoiding eyes and mouth.

   (5) After leaving the outdoor area, wash treat skin with soap and water and wash the treated skin especially hands before eating and drinking.

c) Tick Removal Kits
i) Agencies should provide tick removal kits to employees working in high risk areas. Kits can be kept at the facility where employees start or end their shift, in field vehicles or in first aid kits.

ii) Tick removal kits should include:
1. A magnifier
2. Fine tipped tweezers
3. Instructions for tick removal
4. Antiseptic wipes
5. A tick identification card
6. A plastic bag to save a removed tick – if the worker seeks medical attention the health care provider may ask to see the tick.

d) Standing water
i) Agencies should inspect property and grounds regularly and get rid of standing water (e.g. tires, buckets, cans, bottles, barrels) to reduce or eliminate areas where mosquitoes can lay eggs.

e) Heat Stress
i) Working outdoors in warm weather and wearing protective clothing can add to a workers heat load. Ensure that workers drink plenty of water and can take breaks in cool, shaded areas as needed. Include heat stress in worker health and safety training and instruct workers to be aware of signs of heat stress.

7) Personal Protective Equipment
a) Workers who mix, load, apply, or perform other tasks involving contact with pesticides (identified in the risk assessment and JHA) may need personal protective equipment such as disposable coveralls, gloves, and respirators to prevent or reduce exposure to hazardous chemicals.

b) If respirators are used, they must be used in accordance with the Agencies’ respiratory protection program that includes OSHA’s requirements for respirator selection, medical clearance, fit-testing, training and record keeping.

8) Training
a) Agency health and safety coordinators and/or designee will provide training to city workers that are identified to be at risk for contact with vectors and vector-borne diseases. Training will include:
   i) information on vectors such as where they live and breed
   ii) vector-borne diseases and symptoms, treatments and outcomes
   iii) safe work practices and exposure control measures such as administrative controls, engineering controls, and personal protective equipment.

b) Training should be performed initially, prior to the worker performing his/her outdoor tasks, and annually as a refresher.

c) Training should consist of at a minimum:
   i) the general power point training developed by DOHMH and COSH
   ii) a customized section to include the worker’s specific job tasks and control measures
   iii) recommended and/or required personal protective equipment and
iv) the process for reporting vector borne-illnesses.

9) **Recordkeeping**
   a) Agencies will maintain worker training records per agency policies.
   b) Agencies will maintain worker exposure and medical records as required per OSHA 29 CFR 1910.1020 and 1910.134 and equivalent NYS Public Employee Safety & Health Law Part 27-a
   c) Agencies will record OSHA/PESH recordable injuries and illnesses per 29 CFR 1904 and Labor Law § 27-a Part 801 and 12NYCRR Part 801 SH901 - Instructions for Recording and Reporting Public Employees’ Occupational Injuries and Illnesses using the NYS forms SH 900, SH900.1, and SH 900.2 or equivalent OSHA forms.

10) **Document Maintenance**
   a) This guidance document is a DOHMH document and will be maintained by the DOHMH Occupational Health and Safety Office.

11) **References and Resources**
   a) Educational information on WNV and Zika are available on the NYC Information Line by calling 311 and or on the Department of Health & Mental Hygiene website at
      i) [nyc.gov/health](http://nyc.gov/health) and search **mosquitoes**
      ii) [http://www1.nyc.gov/site/doh/health/health-topics/west-nile-virus.page](http://www1.nyc.gov/site/doh/health/health-topics/west-nile-virus.page)
   c) [osha-niosh_fs-3855_zika_virus_04-2016](http://www.cdc.gov/media/releases/2016/s0422-interim-guidance-zika.html)

12) **Information on Vector Control and Vector-borne Diseases**
   a) **Information on Vector Control**
      The Department of Health and Mental Hygiene (DOHMH) has developed a Comprehensive Mosquito Surveillance and Control Plan 2016 to protect the public health and reduce the risk of an outbreak of WNV or another mosquito-borne disease.

      At this time, West Nile virus is the only locally transmitted mosquito-borne disease in New York City. In 1999, West Nile virus first appeared in the United States, in Queens. Most people infected with the virus have no symptoms. Of those who develop symptoms, most get better on their own, but in rare cases the virus can cause inflammation of the spinal cord and brain.
      Health experts are planning for the possibility the Zika virus, which is spread by certain types of mosquitoes belonging to *Aedes species*, could also affect New York City. The steps outlined in the plan help control all mosquito populations and prevent all mosquito-borne diseases. If the Zika virus is found in local mosquito populations, the City will amplify these measures.
The DOHMH uses integrated pest management (IPM) which is safer and more effective than other pest control methods; it takes away the things pests (including vectors of human diseases) need to survive, such as food, water, shelter and ways to get around.

Each mosquito season, the Health Department takes these pest control steps:
- Reducing mosquito breeding by removing standing water and applying larvicide to sites that cannot be emptied or drained. Larvicides are pesticides that affect only larval life stage of mosquitoes and are harmless to people.
- Working with the public to reduce standing water through public outreach/education and by investigating complaints about mosquito breeding sites and standing water to 311.
- Monitoring mosquito populations and WNV infection in mosquitoes and residents. When surveillance data shows an increased risk of disease, the Health Department spays pesticides to control adult mosquitoes. These applications are carefully planned and conducted to avoid human exposure to the pesticides.

In addition to the DOHMH’s efforts to control mosquitoes, employers, workers and the general public should take steps to prevent being bitten by mosquitoes and ticks and thereby preventing vector-borne diseases.

Prevention steps include:
1. Wearing clothing that covers arms, legs and other exposed skin.
2. Using insect repellents (see details below*).
3. Getting rid of sources of standing water to eliminate mosquito breeding areas.
4. Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside

*Guidance on use of insect repellents:

Always follow label precautions when using insect repellent. Use insect repellent containing an EPA-registered product with one of the following active ingredients: DEET, picaridin, IR3535, and oil of lemon eucalyptus. When used as directed, these products are proven safe and effective, even for pregnant and breastfeeding women. The above mentioned ingredients have demonstrated repellency, but some provide longer-lasting protection than others. Research suggests that repellents containing DEET (N, N-diethyl-m-toluamide) or picaridin (KBR 3023) typically provide longer-lasting protection than the other products, and oil of lemon eucalyptus (p-menthane-3, 8-diol) provides longer-lasting protection than other plant-based repellents. Permethrin is another long-lasting repellent that is intended for application to clothing and gear, but not directly to skin.
Choose a repellent that provides protection for the amount of time that you will be outdoors. The more active ingredient a repellent contains, the longer time it can protect you from mosquito bites. For example, 5% DEET will provide mosquito bite protection for one hours in comparison with 24% DEET for up to 5 hours. Studies suggest that concentrations of DEET above approximately 50% do not offer a marked increase in protection time against mosquitoes; DEET efficacy tends to plateau at a concentration of approximately 50%.

To avoid reaction to DEET or other ingredients in insect repellents, read and follow the directions on all insect repellents before use. Spray insect repellent (permethrin) on the outside of clothing, as it is possible for mosquitoes to bite through thin clothing.

Do NOT spray insect repellent on skin that is under clothing.
Do NOT apply insect repellent to skin that is already irritated, or to cuts/lacerations.
Do NOT spray aerosol or pump products in enclosed areas. Do NOT spray a pump or aerosol product directly on the face. First spray it on hands and then carefully spread it on the face (do not allow insect repellent to contact eyes or mouth).

After returning indoors and before eating, drinking, or smoking, use soap and water to wash skin that has been treated with insect repellent. Reapply repellent when returning outdoors or after eating.

Outdoor workers may need to use sunscreen in conjunction with insect repellent. Repellents that are applied according to label instructions may be used with sunscreen with no reduction in repellent activity. However, limited data show a one-third decrease in the sun protection factor (SPF) of sunscreens when DEET-containing insect repellents are used after a sunscreen is applied. Products that combine sunscreen and repellent are not recommended, because sunscreen may need to be reapplied more often and in larger amounts than needed for the repellent component to provide protection from biting insects. The best option is to use separate products, applying sunscreen first and then applying the repellent. Due to the decrease in SPF when using a DEET-containing insect repellent after applying sunscreen, users may need to reapply the sunscreen more frequently.*

*U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, “CDC Health Information for International Travel, 2016 (Yellow Book).”

**b) Information on Vector-Borne Diseases**

**West Nile Virus**

WNV is known to be transmitted to humans by mosquitoes (especially *Culex* species). A mosquito becomes infected by biting a bird that carries the virus. After about a week, infected mosquitoes can pass the virus to more birds when they bite.
Mosquitoes with West Nile virus also bites and infect people, horses and other mammals. Although WNV can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord); most people (70-80%) who become infected with West Nile virus do not develop any symptoms. About 1 in 5 people who are infected will develop a fever with other symptoms such as headache, joint pains, diarrhea, vomiting, rash, or body aches.

**Zika Virus**

Zika virus is spread to people primarily through the bite of an infected *Aedes* species mosquito. The most common symptoms of Zika infection (Zika) are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually don’t get sick enough to go to the hospital, and they very rarely die of Zika. For this reason, many people might not realize they have been infected. Symptoms usually start two to 12 days after being bitten by an infected mosquito and may last up to a week. Zika may be mistaken for other diseases caused by mosquitoes, such as dengue virus or chikungunya virus. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal brain defects.

In addition to microcephaly, the Brazil Ministry of Health has reported an increased number of people who have been infected with Zika who also have Guillain-Barré syndrome (GBS). Guillain-Barre is an uncommon sickness of the nervous system in which a person’s own immune system damages the nerve cells, causing muscle weakness, and sometimes, paralysis. GBS is very likely triggered by Zika in a small proportion of infections, much as it is after a variety of other infections.

Once a person has been infected, he or she is likely to be protected from future infections. Health care providers use a blood test to confirm Zika.

Zika is affecting parts of Central and South America, Mexico, the Caribbean and other places listed by the Centers for Disease Control and Prevention. (Find the latest Zika-affected locations at cdc.gov/zika.) The type of mosquito linked to the current outbreak, *Aedes aegypti*, lives in these places. *Aedes aegypti* has not been found in New York City.

Zika is not spreading in New York City. A different mosquito that may carry Zika is found in New York City from May-October. This mosquito is called *Aedes albopictus* (also known as Asian tiger mosquito). This mosquito has ability to carry Zika virus, but health experts are still learning whether it is likely to spread Zika to people. Just because a mosquito can carry the virus does not mean that it will cause an outbreak. Health experts are planning for the possibility that *Ae. albopictus* could get infected with Zika locally and are taking aggressive steps to monitor this and take action if
needed. Read “What the City is Doing” on nyc.gov/health/zika for the City’s latest actions.

Chikungunya
Chikungunya is a virus spread among people by mosquitoes. People infected with the virus often complain of fever and joint pain. In December, 2013, a large outbreak of chikungunya began in the Caribbean. Prior to this outbreak, the disease was only found in parts of Africa, Asia, Europe and the Indian and Pacific Oceans. Many New Yorkers have become infected after traveling to other parts of the world, especially the Caribbean.

While the risk seems low, it is possible for an Asian tiger mosquito to spread the chikungunya virus in New York City. If a mosquito bites a person who is infected with chikungunya, that mosquito could go on to spread the virus to another person. The Health Department is conducting human and mosquito surveillance, throughout the mosquito season (April-October). If local mosquitoes tested positive for chikungunya virus or start to spread the virus, there will be a rapid response to eliminate infected mosquitoes.

Most people infected with chikungunya virus develop some symptoms, typically fever and joint pain. Other symptoms may include headache, muscle pain, joint swelling or rash. Symptoms usually begin three to seven days after being bitten by an infected mosquito. Chikungunya does not often result in death, but the symptoms can be severe and disabling. Most people feel better within a week, but joint pain may persist for months in some.

People at risk for more severe symptoms include babies infected around the time of birth, adults who are 65 and older and people with medical conditions such as high blood pressure, diabetes or heart disease. Once a person gets the virus, he or she is likely to be protected from future infections.

The virus is diagnosed by a blood test. No specific treatment is available. People infected with the virus may receive medications to help relieve their symptoms. People who have the virus should stay indoors or wear protective clothing and mosquito repellent for eight days after they start to feel sick. This will help prevent mosquitoes from spreading the virus to other New Yorkers.

Dengue Fever (Breakbone, Dengue Hemorrhagic Fever)
Dengue fever, is caused by the dengue viruses. These viruses are spread by the bite of infected Aedes mosquitoes. This disease is mainly tropical in origin but occasionally residents or visitors from other countries may arrive in this country with dengue fever. Although cases originating in the United States are uncommon, outbreaks have recently been reported in parts of the Caribbean and Central and South America.
Dengue fever may occur in people of all ages exposed to infected mosquitoes. The disease primarily occurs in tropical Asia and the Caribbean, usually during the rainy seasons in areas with high numbers of infected mosquitoes.

Dengue fever is characterized by high fever, severe headache, backache, joint pains, nausea and vomiting, eye pain and rash. Dengue hemorrhagic fever is first characterized by a fever that lasts from 5 to 7 days with symptoms that can occur with many other illnesses (e.g., nausea, vomiting, abdominal pain, and headache). This stage is followed by hemorrhagic manifestations, tendency to bruise easily or other types of skin hemorrhages, bleeding nose or gums, and possibly internal bleeding. Circulatory failure and shock may occur, which if untreated, can result in death.

Dengue fever may occur from 3 to 14 days after exposure to an infected mosquito, commonly within 5 to 7 days. The diagnosis is made by demonstrating specific antibodies to the virus in blood or spinal fluid.

Like other mosquito-borne viruses, there is no specific treatment available for dengue fever. Intravenous fluids and oxygen therapy are often used for patients who experience shock during their illness.

**Lyme Disease**

Lyme disease is the most common tick-borne infection in New York City and the U.S. It is caused by the bacterium *Borrelia burgdorferi*, and typical symptoms include fever, headache, fatigue, and a characteristic skin rash called erythema migrans. If left untreated, infection can spread to the joints, heart, and nervous system.

In the eastern United States, Lyme disease is transmitted by the bite of an infected blacklegged (deer) tick, *Ixodes scapularis*, the same tick that transmits babesiosis and anaplasmosis. Not all blacklegged ticks are infected and once a person is bitten, the tick must be attached for at least 24-36 hours to transmit Lyme disease. Lyme disease cannot be spread from person-to-person.

Blacklegged ticks are generally found near the ground in brushy or wooded areas. They can carry pathogens and may transmit them to the host during blood meals.

Blacklegged ticks have been found in New York City but are more common in New York and other surrounding states. Most recently (2015, 2016), blacklegged ticks were collected from Pelham Bay Park in the Bronx; Clay Pit Pond, High Rock and Wolfe’s Pond Parks in Staten Island; and Alley Pond Park, Highland Park and Floyd Bennett Field in Queens and Brooklyn. Some of the ticks from Pelham Bay, High Rock Park and Clay Pit Pond Parks tested positive for the bacterium that causes Lyme disease. It is abundant throughout Westchester, Nassau, and Suffolk Counties and
many counties in upstate New York. Most Lyme disease infections occur during the spring and summer when immature ticks, called nymphs, are most abundant. Since the nymphal stage of the tick is smaller, they are harder to detect and may remain attached to the skin for longer periods of time. The annual number of cases in NYC has ranged from 643 in 2009 to 849 in 2014. For the most recent information on the number of NYC residents reported with Lyme disease, please visit EpiQuery (https://a816-healthpsi.nyc.gov/epiquery/)

Rocky Mountain Spotted Fever
RMSF is a tick-borne disease caused by bacterium Rickettsia rickettsii. It occurs mainly in southeastern and south central US (but is not limited to there). Vectors include American dog tick (east of Rocky Mountains), Rocky Mountain wood tick, and the lone star tick. There is no person to person transmission. Cases have occurred in all five boroughs in NYC.

Symptoms include fever, headache, vomiting and muscle pain. A rash may develop. RMSP can be severe or fatal if not treated in first few days.

Babesiosis
Babesiosis is a rare, sometimes severe or fatal tick-borne disease caused by Babesia microti, a protozoan parasite that infects red blood cells. The disease can cause fever, fatigue, jaundice, and anemia lasting from several days to several months. People who are elderly or immunocompromised (including people without a spleen) are most likely to be infected and most likely to have a severe infection. Many infections can occur without producing symptoms.

Babesiosis is transmitted by the bite of an infected blacklegged tick, I. scapularis, the same tick that transmits Lyme disease and anaplasmosis. Highly endemic areas for B. microti in the greater New York City region include Suffolk County (especially Fire Island and Shelter Island), portions of Connecticut and New Jersey, and Nantucket Island off the Massachusetts shore. Transmission risk is greatest during the spring and summer.

Although rare, there have been several reports of transfusion-transmitted babesiosis. Persons infected with B. microti may not show signs of illness. If a person with babesiosis donates blood, the infected red blood can then cause infection in the person who receives the blood products. At this time there is no B. microti testing being done on donated blood.

Anaplasmosis
Anaplasmosis is a tick-borne infection caused by the bacterium, Anaplasma phagocytophilum. A person can develop anaplasmosis if bitten by a tick that is infected with this bacterium it is transmitted by the black-legged tick, I. scapularis, the same tick that transmits Lyme disease and Babesiosis. Black-legged ticks may
become infected with *A. phagocytophilum* when feeding on mice, deer or elk. An infected tick must be attached to a person's skin at least 12-24 hours to transmit the disease. Most patients become infected during the spring and summer in endemic areas, when nymphal stage of this tick is in greatest abundance. Anaplasmosis cannot be spread from person-to-person. Most NYC patients with anaplasmosis become infected after traveling to Long Island, Westchester County, and the lower Hudson Valley region of upstate New York. For more information about the black-legged tick visit the tick page. The number of cases reported in NYC has ranged from 9 to 27 per year.

Tick-borne diseases such as Lyme disease, babesiosis and anaplasmosis can be effectively prevented by avoiding tick bites. Always wear protective clothing and use insect repellent when visiting tick infested areas.
Attachment 1
Zika (Vector) Risk Matrix
Guidance for the Prevention of Vector-borne Diseases in City Workers
July 1, 2016

Purpose:
This risk matrix was developed to provide standard criteria for performing risk assessments, primarily for workers coming into contact with mosquitoes that can transmit Zika virus. However, the categories below can also be used to identify risk for contact with mosquitoes transmitting West Nile virus and ticks transmitting Lyme or other tick-borne diseases.

Definitions:

1. **Risk** - if the Department of Health and Mental Hygiene (DOHMH) determines that there may be local transmission of Zika virus, “risk” as used in this table refers to the risk of having contact with mosquitoes that can transmit the Zika virus (not the risk of becoming infected with Zika virus, which is based on other factors in addition to being bitten by a mosquito carrying the virus).

2. **Control Measures** – refers to measures that all people can take to minimize or eliminate their risk, including staying indoors in screened areas, sleeping under mosquito netting if in unscreened housing, avoiding mosquito habitats, wearing clothing that will cover exposed skin, using insect repellent on skin and/or clothing, wearing hats with mosquito netting, avoiding exposure to the virus through sexual contact, etc.\(^1\)

3. **Everyday activities** – refers to activities not related to employment including being at home, driving, shopping, commuting, playing sports, visiting friends and family, visiting the beach and park, going to the doctor and dentist, etc.

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<thead>
<tr>
<th>Worker Risk Category</th>
<th>Description</th>
<th>Control Measures</th>
<th>Notes</th>
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| Risk Category 1      | Same or lower risk than the general public performing everyday activities. These workers spend their work day indoors in screened and/or air conditioned spaces.  
Examples in this group include office workers, retail workers, restaurant workers, teachers, people that work from home, etc. | Agencies should provide general information on Zika to workers and workers should follow guidance on the prevention of Zika virus (same as for the general public). | |

\(^1\) Zika can spread from one person to another through sexual contact. Health experts are still learning about this risk but recommend that people who travel to Zika-affected areas use condoms and birth control while they are traveling and after they return home. Condoms may stop Zika from spreading sexually. Birth control helps prevent pregnancy in which one or both sex partners might have Zika.
**Attachment 1**  
Zika (Vector) Risk Matrix  
Guidance for the Prevention of Vector-borne Diseases in City Workers  
July 1, 2016

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| **Risk Category 2**  | Workers, who in order to perform their jobs or certain job tasks, are outdoors for parts of their work day every day, or on a regular basis in areas around the City. These workers use City streets and sidewalks and mass transit. These workers, because they spend more time outdoors, may be at an increased risk of being bitten by mosquitoes compared to indoor workers in risk category 1.  

*Examples in this group include restaurant inspectors, visiting nurses, traffic officers, construction workers, building inspectors, trash collectors, police officers, fire fighters, etc.* | Agencies should provide general information on Zika to workers and workers should follow guidance on the prevention of Zika virus (same as for the general public). |       |
| **Risk Category 3**  | Workers who in order to perform their jobs or job tasks are outdoors for parts of their work day every day or on a regular basis and work in areas close to or in mosquito habitats such as parks, beaches, wilderness areas, and facility grounds with vegetation (grass, trees and bushes).  

*Examples in this group include workers in parks, workers in the watershed, workers at the beach, workers performing limited landscaping (i.e. cutting small patches of grass), day camp inspectors, construction workers in a park or vegetated area, etc.* | Agencies should perform job hazard analyses, develop safe work practices, and provide personal protective equipment as needed and perform training (see sections 6, 7 and 8 of this guidance document). | In addition to Zika virus, workers should prevent other vector borne diseases including mosquito-borne diseases such as West Nile virus and tick-borne diseases such as Lyme disease. |
### Zika (Vector) Risk Matrix

**Guidance for the Prevention of Vector-borne Diseases in City Workers**  
**July 1, 2016**

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| Risk Category 4      | These are workers that for certain job tasks are required to be in areas that are densely populated with mosquitoes. These can be workers from categories 2 and 3 that sometimes perform a category 4 task or workers that are normally in category 4 based on their jobs.  
  
*Examples in this group include workers performing mosquito control activities (applying larvicide in marshes, spraying adulticide in vegetated areas); grounds maintenance workers/landscapers in heavily vegetated areas; law enforcement agents performing investigations in wooded or overgrown areas, marshy areas, in waterways, or crawl spaces underneath buildings; firefighters responding to fires in wooded, overgrown or marshy areas; workers clearing overgrown vegetation from right of way areas; and workers in sleep away camp in wooded or wilderness areas.* | Agencies should perform job hazard analyses, develop safe work practices, and provide personal protective equipment as needed and perform training (see sections 6, 7 and 8 of this guidance document). | In addition to Zika virus, workers should prevent other vector borne diseases including mosquito-borne diseases such as West Nile virus and tick-borne diseases such as Lyme disease. |