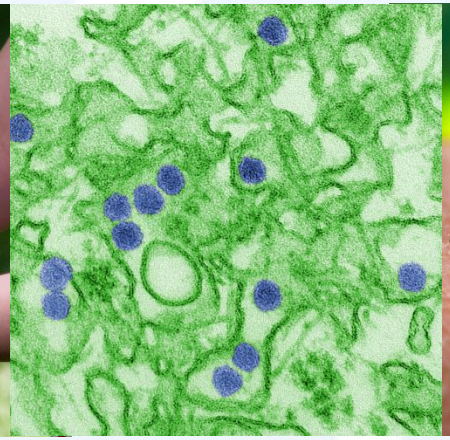
U.S. Department of Labor
Occupational Safety and Health Administration

OSHA Worker Safety and Health Activities and the Ongoing Zika Virus Outbreak

Updated: September 20, 2016






Chris Brown
Senior Health Scientist
Office of Emergency Management and Preparedness
Directorate of Technical Support and Emergency Management (DTSEM)

OSHA®

Zika virus background

- Viral disease mainly transmitted by mosquitoes
  - Mainly *Aedes* species, which can be aggressive biters

A. aegypti
Better vector; will rest indoors.

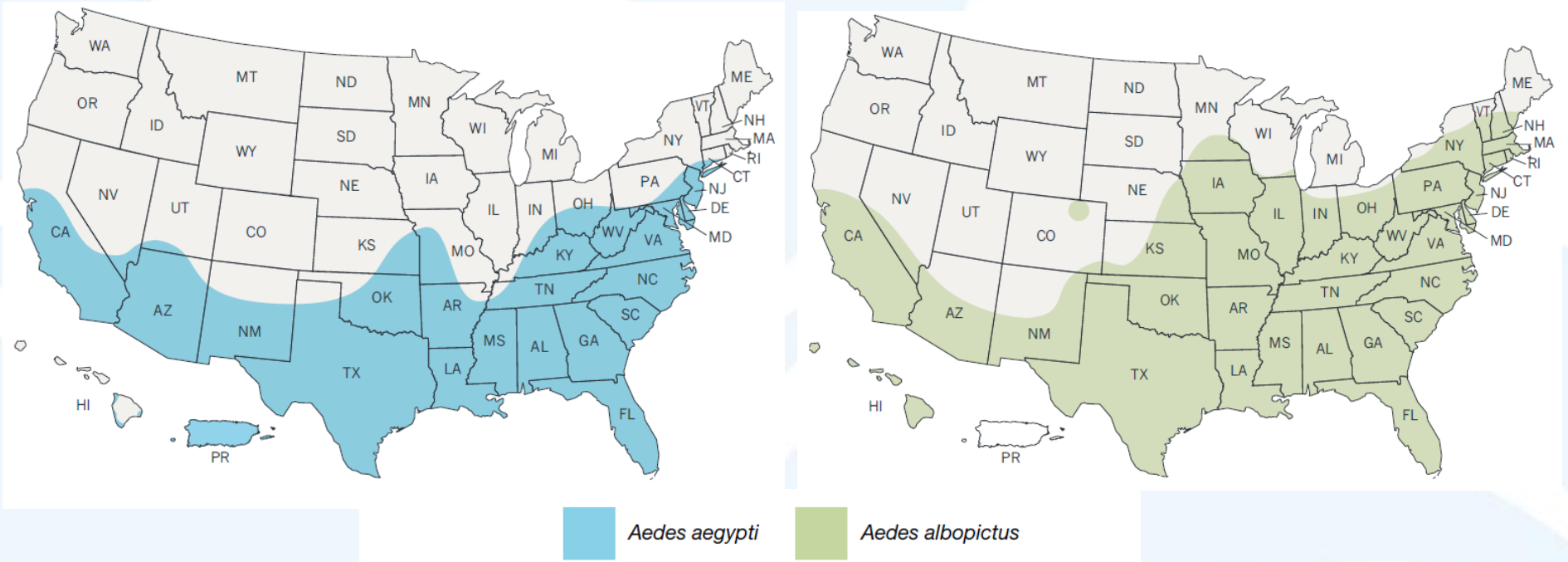
A. albopictus
Better suited to temperate climates.

- In some instances, may be also spread via
  - Bloodborne (contact) transmission
  - Aerosol exposure (in labs, based on animal models)
  - Sexual transmission

Source: CDC. All countries and territories with active Zika virus transmission. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. http://www.cdc.gov/zika/geo/active-countries.html

OSHA®

Zika virus background



In 2016, the **estimated range of *Aedes* mosquitoes' includes states in every OSHA region except Region X.**

These maps DO NOT show: Exact locations or numbers of mosquitoes living in an area or risk or likelihood that these mosquitoes will spread viruses.

Source: CDC. Estimated range of *Aedes albopictus* and *Aedes aegypti* in the United States, 2016. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. http://www.cdc.gov/zika/pdfs/zika-mosquito-maps.pdf

OSHA®

Zika virus background

- Zika identified in Uganda in 1947 in monkeys.[1]
- First human outbreak in Africa in 1952.[1]
- Human case in researcher confirmed through virus isolation and re-isolation in 1964.[2]
- Other cases have been associated with outbreaks in Africa, Asia, and Pacific Islands.
- Some other occupational cases
  - 1972: Lab worker[3]
  - 2008: Scientists[4] (mosquito bites)

[1] Kindhauser, MK, Allen, T, Frank, V, Santhana, R, and Dye, C. (2016). Zika: The Origin and Spread of a Mosquito-Borne Virus. *Bulletin of the World Health Organization.*

[2] Simpson, D. I. H. (1964). Zika virus infection in man. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, *58*(4), 339-348.

[3] Filipe, A. R., Martins, C. M. V., & Rocha, H. (1973). Laboratory infection with Zika virus after vaccination against yellow fever. *Archiv für die gesamte Virusforschung*, *43*(4), 315-319.

[4] Foy, B. D., Kobylinski, K. C., Chilson Foy, J. L., Blitvich, B. J., Travassos da Rosa, A., Haddow, A. D., ... & Tesh, R. B. (2011). Probable non-vector-borne transmission of Zika virus, Colorado, USA. *Emerg Infect Dis*, *17*(5), 880-2.

OSHA®

Current outbreak

- Began in countries throughout Central and South America (Brazil) and Pacific Islands
- **Active transmission in defined areas of U.S. mainland:** small areas of Florida
- Active transmission in U.S. territories
  - PR
  - USVI
  - AS

Source: CDC. All countries and territories with active Zika virus transmission. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. http://www.cdc.gov/zika/geo/active-countries.html; CDC. Zika virus disease in the United States, 2015–2016. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. http://www.cdc.gov/zika/geo/united-states.html

OSHA®

Occupational exposures & cases

- Occupational cases may not be well surveilled, particularly outside of the U.S.
  - Domestically, state reporting to CDC may vary
- One **laboratory-acquired case** at University of Pittsburgh
  - Sharps injury to individual working with Zika virus
  - Student (not a covered employee)
  - OSHA made contact with university, but OSHA did not have jurisdiction

Signs and Symptoms

- Approximately **1 in 5 infected people develop signs and symptoms**
  - Usually mild
  - Typically begin 2-7 days after exposure
  - Generally last 2-7 days
- Generally include **fever, rash, joint pain and red or pink eyes**[1]
- Muscle pain and headache, in some cases[2]
- **No specific treatment or vaccine** (yet)

[1] Duffy MR, Chen T-H, Hancock WT, et al. Zika virus outbreak on Yap Island, Federated States of Micronesia. N Engl J Med 2009;360:2536– 43. http://dx.doi.org/10.1056/NEJMoa0805715

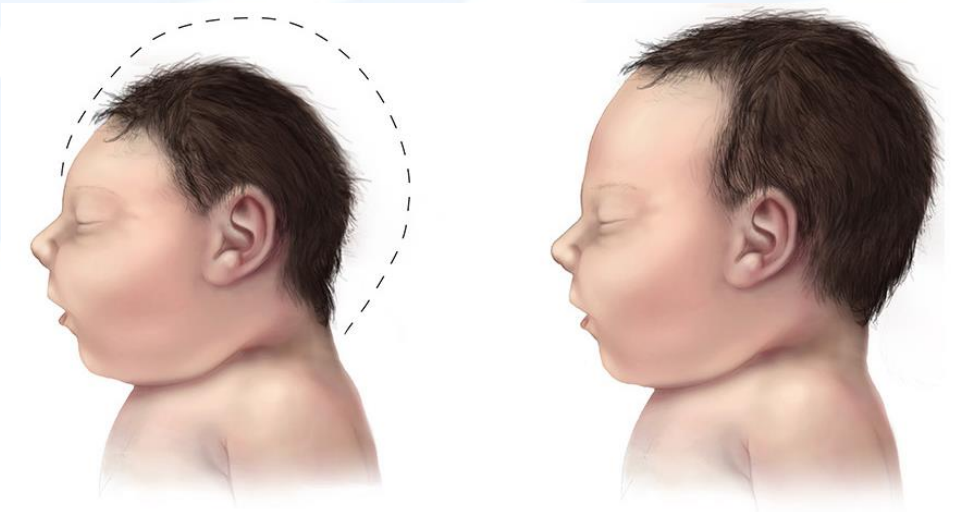
[2] Campos, G. S., Bandeira, A. C., & Sardi, S. I. (2015). Zika virus outbreak, Bahia, Brazil. *Emerg Infect Dis*, *21*(10), 1885.

OSHA®

Reproductive effects

- **Microcephaly**[1]
  - Linked to Zika virus infection preceding or during pregnancy
  - Developmental disorder characterized by **smaller-than-expected head size, brain underdevelopment, and neurocognitive problems** in newborns

Newborn with microcephaly



Newborn with expected head size, normal brain development

[1] Cauchemez, S., Besnard, M., Bompard, P., Dub, T., Guillemette-Artur, P., Eyrolle-Guignot, D., ... & Fontanet, A. (2016). Association between Zika virus and microcephaly in French Polynesia, 2013–15: a retrospective study. *The Lancet*.

Photo credit: CDC

OSHA®

Other health effects

- **Guillain-Barré syndrome (GBS)**[1]
  - Autoimmune disorder often marked by weakness, paralysis, and respiratory impairment
- **Thrombocytopenia**[2]
  - Low platelet count in blood
  - Bleeding into the tissues, bruising, slow blood clotting after injury
- **Death** (in extreme circumstances)
  - Associated with bleeding from severe thrombocytopenia

[1] Smith, D. W., & Mackenzie, J. (2016). Zika virus and Guillain-Barré syndrome: another viral cause to add to the list. *The Lancet*, *387*(10027), 1486-1488.
[2] Karimi, O., Goorhuis, A., Schinkel, J., Codrington, J., Vreden, S. G. S., Vermaat, J. S., ... & Grobusch, M. P. (2016). Thrombocytopenia and subcutaneous bleedings in a patient with Zika virus infection. *The Lancet*, *387*(10022), 939-940.

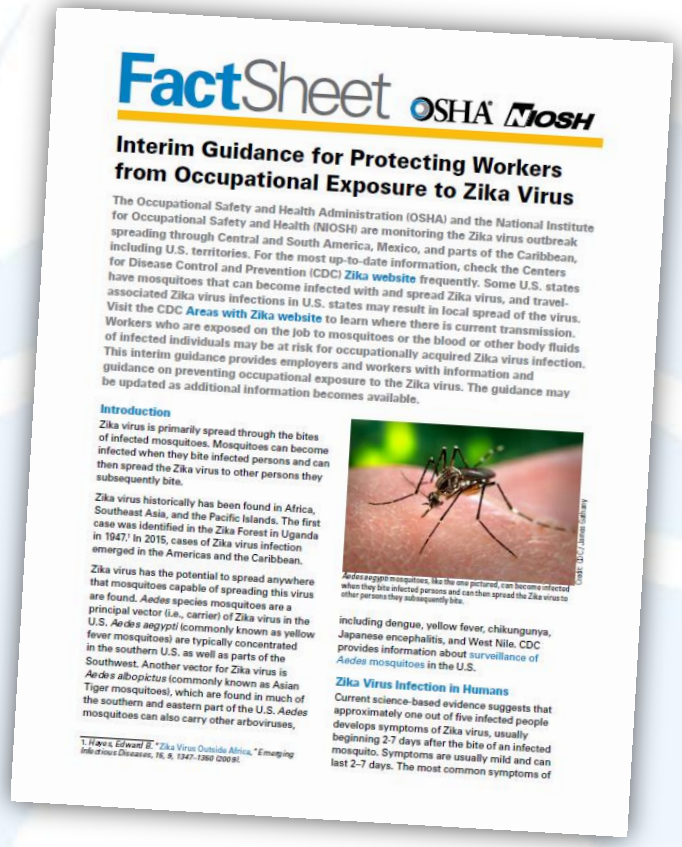
OSHA®

What is OSHA doing?

- **Technical support and assistance**, as requested, to federal, state, local and other levels of government
- Other federal interagency coordination
- Direct support to **private sector employers' and worker groups' questions**
- Coordinating with OSHA NY regional office to ensure **guidance materials available in Spanish**

What is OSHA doing?

- Published joint recommendations with NIOSH
  - Available as an **OSHA-NIOSH FactSheet**
  - **English** and **Spanish**
  - Webpage format at www.osha.gov/zika
- Guidance covers **outdoor, healthcare, laboratory, and traveling workers**
- Advisory in nature, but OSHA standards still apply



FactSheet OSHA NIOSH

Interim Guidance for Protecting Workers from Occupational Exposure to Zika Virus

The Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) are monitoring the Zika virus outbreak spreading through Central and South America, Mexico, and parts of the Caribbean, including U.S. territories. For the most up-to-date information, check the Centers for Disease Control and Prevention (CDC) Zika website frequently. Some U.S. states have mosquitoes that can become infected with and spread Zika virus, and travel-associated Zika virus infections in U.S. states may result in local spread of the virus. Visit the CDC Areas with Zika website to learn where there is current transmission. Workers who are exposed on the job to mosquitoes or the blood or other body fluids of infected individuals may be at risk for occupationally acquired Zika virus infection. This interim guidance provides employers and workers with information and guidance on preventing occupational exposure to the Zika virus. The guidance may be updated as additional information becomes available.

Introduction

Zika virus is primarily spread through the bites of infected mosquitoes. Mosquitoes can become infected when they bite infected persons and can then spread the Zika virus to other persons they subsequently bite.

Zika virus historically has been found in Africa, Southeast Asia, and the Pacific Islands. The first case was identified in the Zika Forest in Uganda in 1947.[1] In 2015, cases of Zika virus infection emerged in the Americas and the Caribbean.

Zika virus has the potential to spread anywhere that mosquitoes capable of spreading this virus are found. *Aedes* species mosquitoes are a principal vector (i.e., carrier) of Zika virus in the U.S. *Aedes aegypti* (commonly known as yellow fever mosquitoes) are typically concentrated in the southern U.S. as well as parts of the Southwest. Another vector for Zika virus is *Aedes albopictus* (commonly known as Asian Tiger mosquitoes), which are found in much of the southern and eastern part of the U.S. *Aedes* mosquitoes can also carry other arboviruses,

Aedes aegypti mosquitoes, like the one pictured, can become infected when they bite infected persons and can then spread the Zika virus to other persons they subsequently bite.

including dengue, yellow fever, chikungunya, Japanese encephalitis, and West Nile. CDC provides information about surveillance of *Aedes* mosquitoes in the U.S.

Zika Virus Infection in Humans

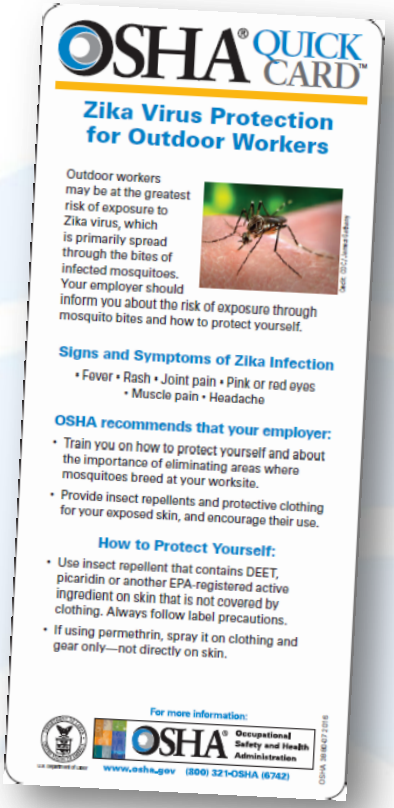
Current science-based evidence suggests that approximately one out of five infected people develops symptoms of Zika virus, usually beginning 2-7 days after the bite of an infected mosquito. Symptoms are usually mild and can last 2–7 days. The most common symptoms of

1. Hayes, Edward B. "Zika Virus Outside Africa," *Emerging Infectious Diseases, 15, 9, 1347-1350 (2009).*

OSHA®

What is OSHA doing?

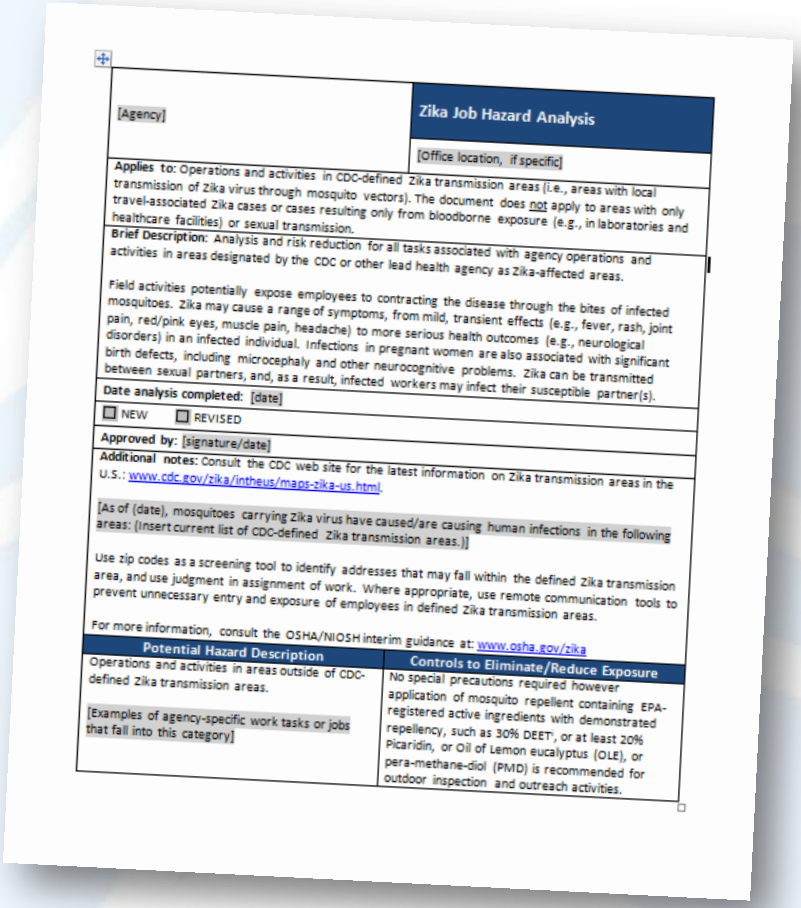
- Published outdoor worker QuickCards
  - **English** and **Spanish**
  - Download from www.osha.gov/zika
  - Or “Z” for Zika under OSHA publications
- Guidance targeted toward **outdoor workers** only
- Advisory in nature, but OSHA standards still apply



OSHA®

What is OSHA doing?

- Federal workforce guidance
  - Joint effort with DOL, OPM, EEOC
- OSHA's piece is a **job hazard analysis template** for federal agencies
  - Adaptable to many types of federal agency operations and job tasks



[Agency]	**Zika Job Hazard Analysis** [Office location, if specific]

Applies to: Operations and activities in CDC-defined Zika transmission areas (i.e., areas with local transmission of Zika virus through mosquito vectors). The document does not apply to areas with only travel-associated Zika cases or cases resulting only from bloodborne exposure (e.g., in laboratories and healthcare facilities) or sexual transmission.

Brief Description: Analysis and risk reduction for all tasks associated with agency operations and activities in areas designated by the CDC or other lead health agency as Zika-affected areas.

Field activities potentially expose employees to contracting the disease through the bites of infected mosquitoes. Zika may cause a range of symptoms, from mild, transient effects (e.g., fever, rash, joint pain, red/pink eyes, muscle pain, headache) to more serious health outcomes (e.g., neurological disorders) in an infected individual. Infections in pregnant women are also associated with significant birth defects, including microcephaly and other neurocognitive problems. Zika can be transmitted between sexual partners, and, as a result, infected workers may infect their susceptible partner(s).

Date analysis completed: [date]

☐ NEW ☐ REVISED

Approved by: [signature/date]

Additional notes: Consult the CDC web site for the latest information on Zika transmission areas in the U.S.: www.cdc.gov/zika/intheus/maps-zika-us.html.

[As of (date), mosquitoes carrying Zika virus have caused/are causing human infections in the following areas: (Insert current list of CDC-defined Zika transmission areas.)]

Use zip codes as a screening tool to identify addresses that may fall within the defined Zika transmission area, and use judgment in assignment of work. Where appropriate, use remote communication tools to prevent unnecessary entry and exposure of employees in defined Zika transmission areas.

For more information, consult the OSHA/NIOSH interim guidance at: www.osha.gov/zika

Potential Hazard Description	Controls to Eliminate/Reduce Exposure
Operations and activities in areas outside of CDC-defined Zika transmission areas. [Examples of agency-specific work tasks or jobs that fall into this category]	No special precautions required however application of mosquito repellent containing EPA-registered active ingredients with demonstrated repellency, such as 30% DEET, or at least 20% Picaridin, or Oil of Lemon eucalyptus (OLE), or para-methane-diol (PMD) is recommended for outdoor inspection and outreach activities.

Source: https://www.chcoc.gov/content/human-resources-flexibilities-and-authorities-federal-employees-affected-zika-virus

General recommendations

- If requested by a worker and if feasible, employers may **consider reassigning** anyone who indicates she is or may become pregnant, or who is male and has a sexual partner who is or may become pregnant, to indoor tasks to reduce their risk of mosquito bites.
  - Buildings with screened windows and doors
  - Air conditioning
- If job functions preclude reassignment, may be possible to **modify work practices** to minimize total time a worker spends outdoors

OSHA®

General recommendations

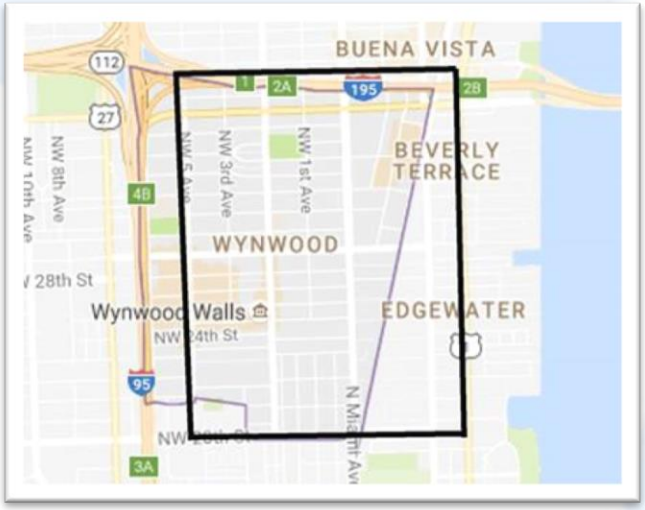
- May not always be possible to re-assign workers, especially if job is outside:
  - Construction and agriculture industries together make up about 5.5 percent of total U.S. employment.[1]
  - Other outdoor workers may include:
    - public works and services
    - public safety
    - oil and gas extraction (excluding off-shore drilling operations)
    - amusement parks
    - travel and transportation operations
    - many others

[1] BLS. Employment by major industry sector. Washington, DC: US Department of Labor, Bureau of Labor Statistics; 2015. http://www.bls.gov/emp/ep_table_201.htm

OSHA®

General recommendations

- **Base precautions on risk**
- For most U.S. workers, there is **no significantly elevated risk of Zika virus exposure outside of CDC-identified Zika-transmission areas**
  - Currently, affected U.S. territories and isolated (i.e., <5-mi^2 zones) around Miami, FL



- Inside transmission areas, risk is greatest for those impacted by reproductive effects.
  - Pregnant / could become pregnant
  - Sexual partners

OSHA®

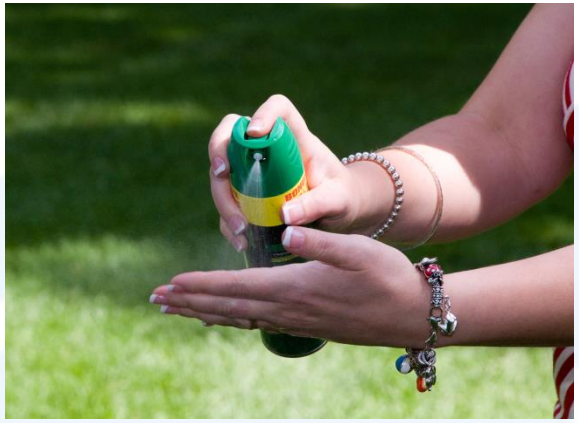
General recommendations

- Mosquitoes lay eggs in standing water, including around worksites
- Whenever possible, **get rid of standing water**
  - Buckets
  - Bottles
  - Barrels
  - Tires
  - Drain pipes
  - Gutters

OSHA®

General recommendations

- Provide **insect repellent** to workers who may be bitten by mosquitoes
  - Use according to manufacturer instructions
  - Also follow OSHA/NIOSH guidance for reapplication and use with sun screens

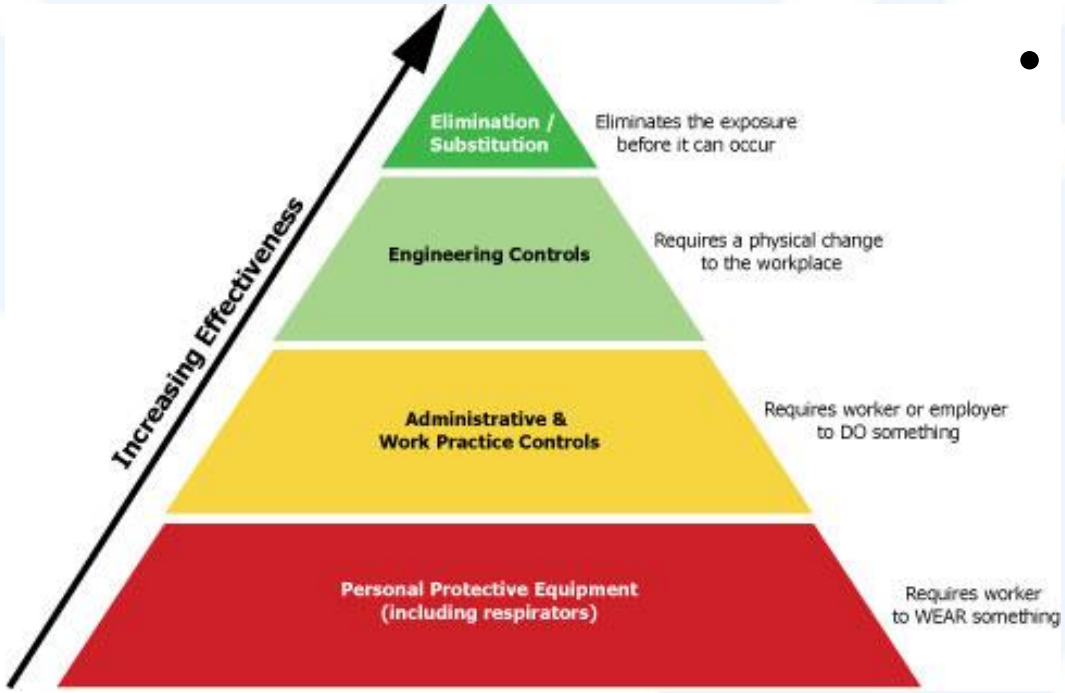


  - Choose repellent with EPA-registered active ingredient (e.g., DEET, picaridin)
  - The more active ingredient, the longer the protection time (up to a point)
  - Only apply permethrin to clothing, not directly to skin

OSHA®

Other controls…

- Follow the **hierarchy of controls** to help reduce or eliminate worker exposures to Zika virus
  - In conjunction with preventive actions, and especially when preventive actions (like reassignment) are not possible

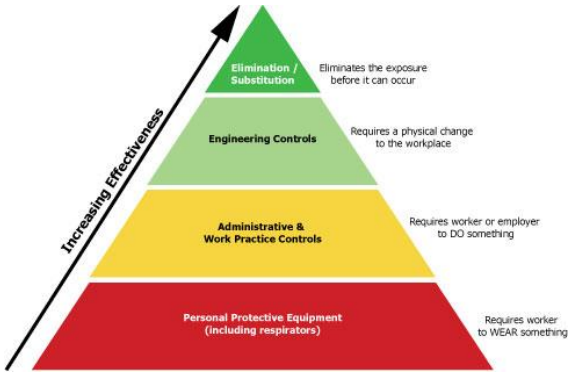


- Focus on **preventing mosquito bites** and other potential sources of exposure

OSHA®

Engineering controls

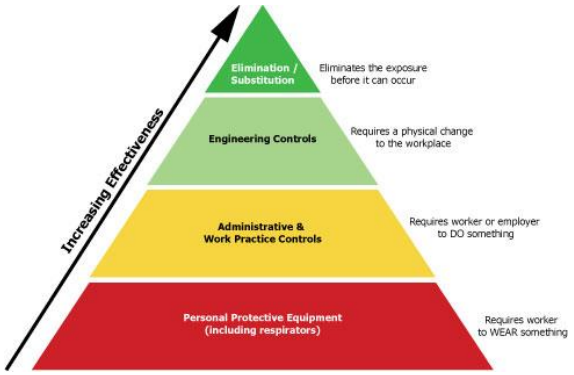
- Built into a worker's physical environment
- Provide protection without the worker having to do anything specific
- Examples:
  - Enclosures (operator booth of amusement park ride, cab of construction or agricultural equipment)
  - In healthcare: needles/syringes, IV administration kits, etc. with engineered sharps injury protection
  - In laboratories: biosafety cabinets



OSHA®

Admin Controls / Work Practices

- Require an employer or worker to do something in order to achieve the intended protection
- Examples:
  - Implementing hand hygiene protocols, and providing facilities for workers to wash up after removing PPE, after using bug spray
  - In healthcare and labs: implementing **universal and standard precautions**
  - In healthcare and labs: avoiding work tasks that contribute to the generation of bioaerosols or droplet sprays

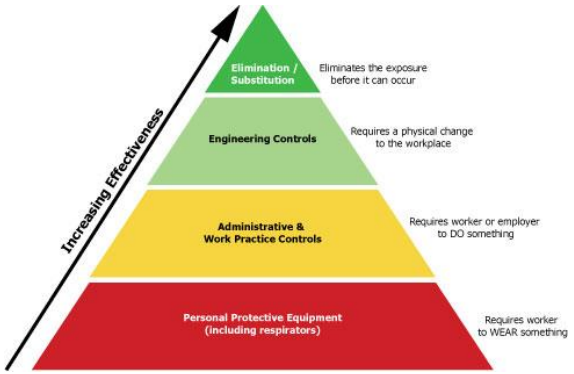


Strictly speaking, reassignment / rotating duties are also administrative controls.

OSHA®

PPE

- Worker has to wear or use a garment or piece of equipment to achieve protection
- Examples:
  - When outdoors, **clothing to cover exposed skin**: Long pants, sleeves, hats with mosquito netting
    - Clothing treated with repellent (e.g., permethrin)
  - For workers with potential bloodborne exposures: Gloves, gowns, masks, face shields
  - Certain healthcare and lab tasks may require enhanced precautions.



OSHA®

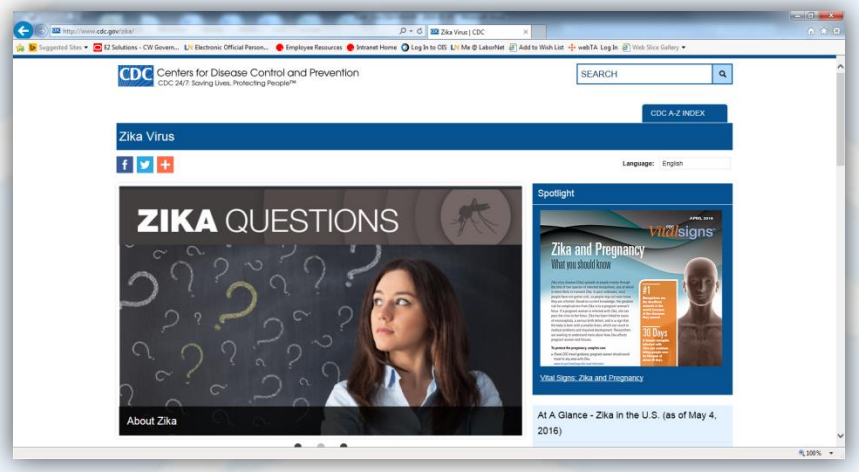
Additional guidance for specific worker groups

- Laboratory workers
  - Follow HHS “Biosafety in Microbiological and Biomedical Laboratories” guidance for arboviruses
- Workers conducting mosquito control operations
  - Consult EPA Worker Protection Standards that apply to insecticides
  - Implement controls appropriate for hazardous chemicals or areas with dense mosquito populations (e.g., respiratory protection, other enhanced PPE)

OSHA®

Additional information

- The OSHA/NIOSH guidance also presents CDC public health information in the context of workplace hazard prevention and control:
  - Recognizing and reporting symptoms of Zika
  - What to do if sick
  - Travel guidelines and warnings
  - Information about pregnancy and birth defects
- For more information:
  www.cdc.gov/zika
  www.cdc.gov/niosh



OSHA®

Other recommended employer actions

- Conduct **hazard assessment,** select **appropriate controls**
  - May be required by some OSHA standards
- Consider offering **flexible leave** and **flexible travel policies**
- Provide **worker training**
  - On protective measures, PPE, insect repellent use, workplace flexibilities, etc.
  - May be required by some OSHA standards

Applicable Standards (29 CFR)

- 1910.132 – PPE General Requirements
- 1910.133 – Eye and Face Protection
- 1910.134 – Respiratory Protection
- 1910.138 – Hand Protection
- 1910.1030 – Bloodborne Pathogens
- 1910.1200 – Hazard Communication

Other requirements may apply in certain situations.

OSHA®

For Federal Agencies

- Occupational Safety and Health Act of 1970
- Executive Order 12196
- 29 CFR 1960

…Require the heads of Federal agencies to furnish to employees places and conditions of employment that are free from job safety and health hazards.

OSHA®

Emergency Preparedness and Response Resources

- Click on "A to Z Index"
- Scroll to emergency topics in the list.

Visit OSHA's web site for additional information. The OSHA page links to many emergency preparedness and response resources.

www.osha.gov | www.osha.gov/SLTC/emergencypreparedness/

Questions?

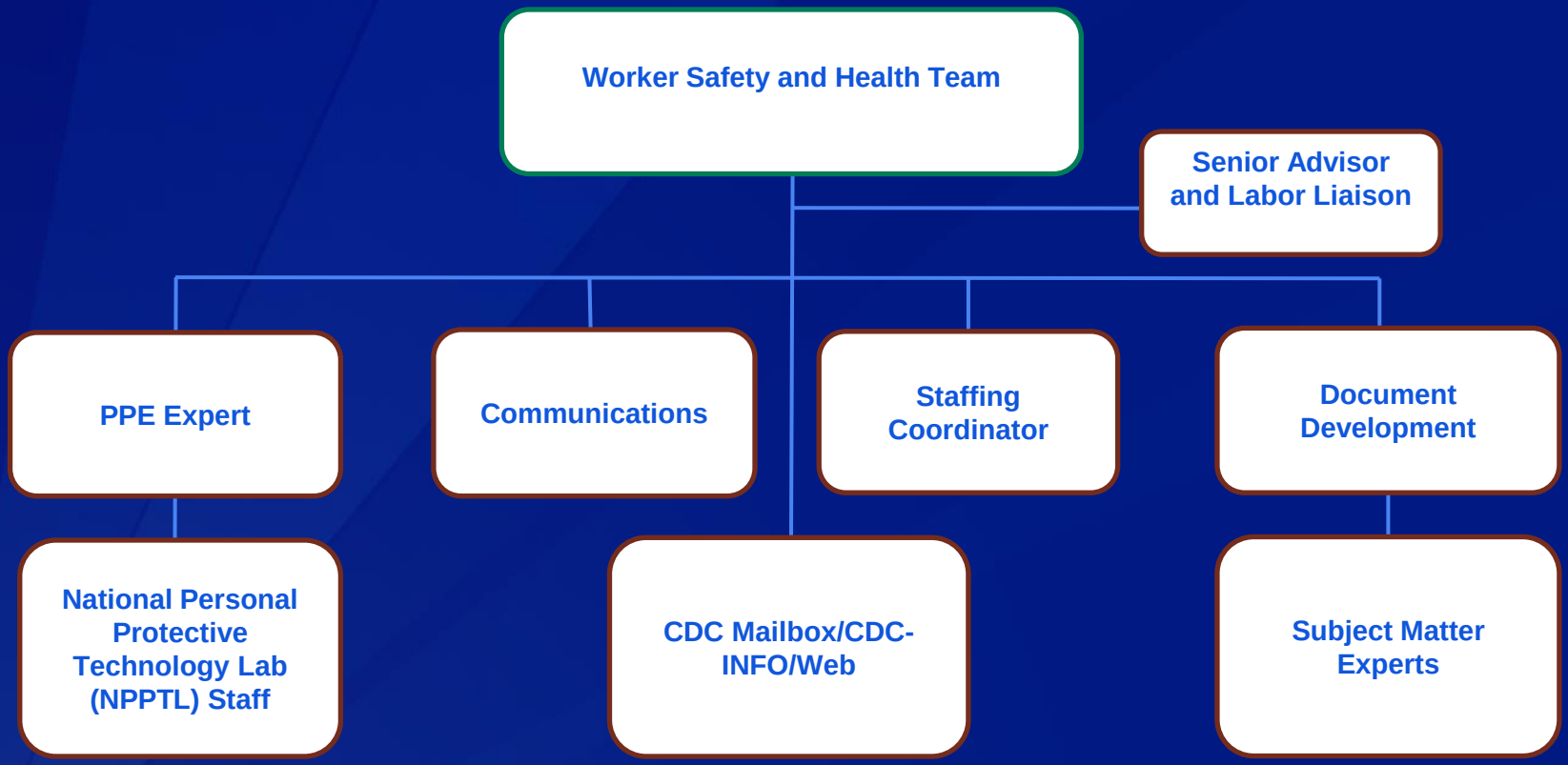
Chris Brown
Office of Emergency Management and Preparedness
Occupational Safety and Health Administration (OSHA)
U.S. Department of Labor
Phone: (202) 693-2368
brown.christopher.k@dol.gov

NIOSH Worker Safety and Health Team Update

CDR Jill M. Shugart, MSPH, REHS
Senior Environmental Health Specialist
CDC/NIOSH Emergency Preparedness & Response Office

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CDC/NIOSH Worker Safety and Health Team EOC Activation



Case Counts in the US (updated October 12, 2016)

US States

- Locally transmitted: 128
- Travel-associated: 3,807
- Laboratory acquired: 1

US Territories (PR, AS, USVI)

-Locally transmitted: 25,871
-Travel-associated: 84
-Laboratory acquired: 0

www.cdc.gov/niosh/zika

Do your homework before traveling

- If you are pregnant, do not travel to areas with Zika.
- Pregnant women should talk with their healthcare provider and consider postponing nonessential travel to Southeast Asia, where Zika is endemic.
- If you must travel, talk to your doctor or other healthcare provider before your trip.
- If you are trying to get pregnant, consider avoiding nonessential travel to areas with Zika.

Do your homework before traveling

- If you travel to an area with Zika:
  - Strictly follow steps to prevent mosquito bites.
  - Use condoms or do not have sex during the trip.
  - Even if you do not feel sick, take steps to prevent mosquito bites for 3 weeks after you return so you don't spread Zika to uninfected mosquitoes.

cdc.gov/zika/transmission/sexual-transmission.html

Keep mosquitoes outside when traveling

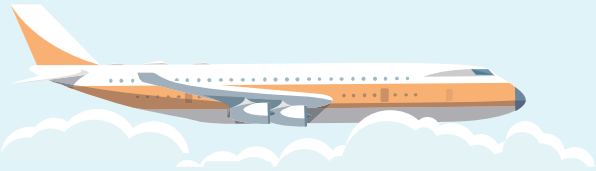
- When traveling
  - Stay in places with air conditioning and with window and door screens.
  - Use a bed net if air conditioned or screened rooms are not available or if sleeping outdoors.

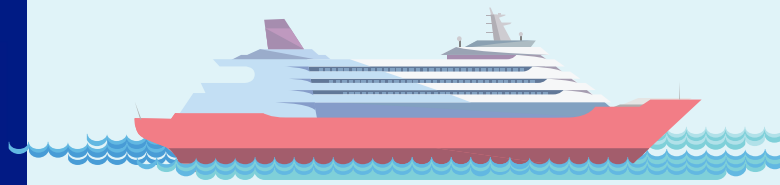
Do your homework before traveling

See the latest travel notices at:

wwwnc.cdc.gov/travel/page/zika-travel-information

*Employers should consider allowing flexibility in required travel to areas with active Zika transmission for concerned staff





What is CDC doing?

- Activated Emergency Operations Center (EOC) to level 1.
- Providing on-the-ground support in areas with Zika.
- Educating healthcare providers and the public about Zika.
- Posting travel guidance.
- Providing laboratories with diagnostic tests.
- Creating and distributing Zika Prevention Kits to affected US territories.
- Conducting a study to evaluate the persistence of Zika virus in semen, vaginal fluids and urine.

What is CDC doing?

- Working with partners to
  - Monitor and report cases.
  - Conduct studies to learn more about the potential link between Zika and Guillain-Barré syndrome.
  - Create action plans for state and local health officials to improve Zika preparedness.
  - Publish and disseminate guidelines to inform testing and treatment of people with suspected or confirmed Zika.
  - Publish and disseminate conclusions on the causal association between Zika and microcephaly.

For the most current information, visit
www.cdc.gov/zika

jshugart@cdc.gov

404-498-2559

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.