

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

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

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## 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>



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## Zika virus background

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

<sup>1</sup> 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*.

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

<sup>3</sup> 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.

<sup>4</sup> 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.



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## Current outbreak

- Began in countries throughout Central and South America (Brazil) and Pacific Islands
- **Active transmission in defined areas of U.S. mainland:** (1 sq. mi. area of Miami, FL)
  - 14 cases (plus 2,246 travel-acquired cases; 22 sexually transmitted)
- Active transmission in U.S. territories
  - 7,855 cases in Puerto Rico (plus 34 travel-acquired)
  - 101 cases in USVI (plus 1 travel-acquired)
  - 44 cases in American Samoa

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>



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## 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 (volunteer, not working in employee capacity)
  - OSHA did make contact with university, but OSHA does not have jurisdiction (PA is Fed OSHA state; University is public sector)



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## 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<sup>1</sup>**
- Muscle pain and headache, in some cases<sup>2</sup>
- **No specific treatment or vaccine (yet)**

<sup>1</sup> 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>  
<sup>2</sup> Campos, G. S., Bandeira, A. C., & Sardi, S. I. (2015). Zika virus outbreak, Bahia, Brazil. *Emerg Infect Dis*, 21(10), 1885.



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## Reproductive effects

- **Microcephaly<sup>1</sup>**

- 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



<sup>1</sup> 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



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## Other health effects

- **Guillain-Barré syndrome (GBS)<sup>1</sup>**

- Autoimmune disorder often marked by weakness, paralysis, and respiratory impairment

- **Thrombocytopenia<sup>2</sup>**

- 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

<sup>1</sup> 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.

<sup>2</sup> 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.



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## 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 (including R2 staff in Puerto Rico) to ensure **guidance materials available in Spanish**



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## 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](http://www.osha.gov/zika)
- Guidance covers **outdoor, healthcare, laboratory, and traveling workers**
- Advisory in nature, but OSHA standards still apply



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## What is OSHA doing?

- Published outdoor worker QuickCards
  - **English** and **Spanish**
  - Download from [www.osha.gov/zika](http://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



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## 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 **rotate workers between job duties**
  - Lessen time each worker spends outdoors





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## 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.<sup>1</sup>
  - 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

<sup>1</sup> 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](http://www.bls.gov/emp/ep_table_201.htm)



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## 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 1-mi<sup>2</sup> zone in Miami, FL



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



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## 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



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## 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

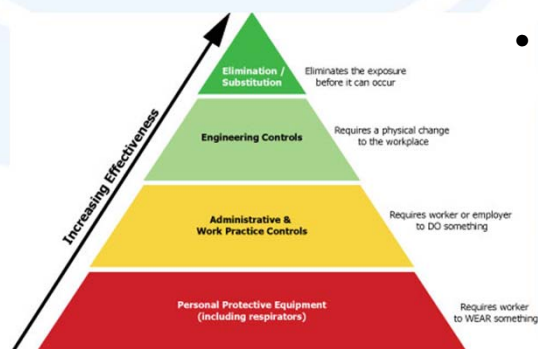




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## Other controls...

- 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



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## 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



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## 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.*



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## 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.



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## Additional guidance for specific worker groups

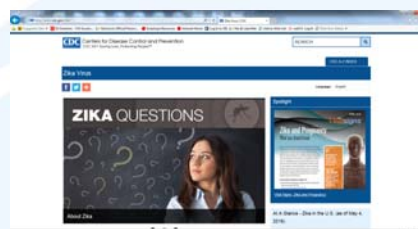
- Laboratory workers
  - Follow HHS “Biosafety in Microbiological and Biomedical Laboratories” guidance for arboviruses
- Workers conducting mosquito control operations
  - Consult EPA Worker Protection Standards that apply to insecticides
  - Implement controls appropriate for hazardous chemicals or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



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## 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](http://www.cdc.gov/zika)
  - [www.cdc.gov/niosh](http://www.cdc.gov/niosh)



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## Other recommended employer actions

- Conduct **hazard assessment**, select **appropriate controls**
  - May be required by some OSHA standards
- Consider offering **flexible sick 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



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## 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.*



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## 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](http://www.osha.gov) | [www.osha.gov/SLTC/emergencypreparedness/](http://www.osha.gov/SLTC/emergencypreparedness/)



NEWSLETTER

OSHA QuickTakes

- Find out if OSHA has inspected a workplace
- Find information on construction hazards
- Find health and safety information



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## Questions?

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