

UN Medical Services Division

Zika Virus: Mosquito bite avoidance for UN Staff

Updated on 9 February 2016

(Please be sure to consult <https://hr.un.org/page/zika-virus> for the latest version of this document.)

General Protective Measures

- ◆ **Avoid spending time outdoors.** Zika virus-carrying mosquitoes are most active during daylight hours. Modify your pattern of activity such that you try to stay indoors during the day whenever possible.
- ◆ **Reduce the amount of exposed skin by wearing appropriate clothing.** Wearing light-colored long-sleeved shirts, long pants, socks, gloves, and hats can significantly reduce the chance of mosquito bites. Also, consider tucking shirts into pants as well as pants into socks. Wear closed shoes instead of sandals to reduce risk.
- ◆ **Use permethrin-treated clothing.** Repellents or insecticides, such as permethrin, can be applied to clothing and gear for added protection. Treat shoes, pants, socks, hats and other gear with permethrin, strictly using the application instruction on the product label. Never use permethrin directly on skin.
- ◆ **Reduce indoor mosquito interactions.** Stay and sleep in window-screened or air-conditioned rooms. Repair screen holes promptly. Bed nets are essential in providing protection when accommodations are not screened or air conditioned.
- ◆ **Bed nets.** Use a bed net, especially for those who sleep during the day (such as pregnant women, infants, the bedridden and/or elderly, and night-shift workers). If bed nets do not reach the floor, they should be tucked under mattresses. Bed nets are most effective when treated with a pyrethroid insecticide. WHO recommendations for insecticidal mosquito nets are found at http://www.who.int/whopes/Long-lasting_insecticidal_nets_November_2015.pdf. Pre-treated, long-lasting bed nets can be purchased before travelling, or nets can be treated after purchase. Effective, treated nets may also be available in destination countries. Nets treated with a pyrethroid insecticide (i.e. Permethrin) will be effective for several months if they are not washed. Long-lasting pretreated nets may be effective for approximately 3 years if properly treated.

Use of Repellents

- ◆ **Apply lotion, liquid, or spray repellent to exposed skin or clothing.** Use repellents as directed on the product label. Avoid repellent contact with the mouth and eyes, and never use over cuts, wounds, or irritated skin. When using sprays, do not spray directly on face — spray on hands first and then apply to the face. Do not apply to eyes or mouth and use sparingly around ears. Wash hands after application to avoid accidental exposure to eyes or ingestion. Use just enough repellent to lightly cover your skin and clothing; using excessive amounts of insect repellent will not increase protection. Children should not handle any repellents by themselves.

- ◆ **Use only insect repellents with approved active agents.** Products containing DEET, picaridin, or IR3535 are proven to be effective in reducing mosquito bites by up to 98% when used as indicated (Table 1). While these products can be used by pregnant women, the manufacturer's label recommendations must be followed closely. Avoid repellents containing non-approved agents (such as citronella, geranium, cedar, soybean, and peppermint), whose effectiveness has not been established.

Table 1: Approved insect repellent active agents for anyone older than 2 months, including pregnant and breastfeeding women¹⁻³

Active Agent
DEET (20% or higher for adult and 25% or lower for children and pregnant women)
Picaridin (also known as KBR 3023 and Icaridin) IR3535

Contact your local UN Clinic or family doctor for advice on approved repellents available in your country

* Reapply frequently, as instructed, and at least every 3-4 hours.

* Oil of lemon eucalyptus products (such as Repel Lemon Eucalyptus, Bug Shield Lemon Eucalyptus, Coleman Botanicals DEET-Free) should NOT be used on children under 3 years of age and on pregnant/breastfeeding women.³

¹ DEET-based insect repellents: safety implications for children and pregnant and lactating women. Gideon Koren, Doreen Matsui, Benoit Bailey. CMAJ. 2003 August 5; 169(3): 209–212. Available at:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC167123/>

² <http://www.cdc.gov/media/releases/2016/s0315-zika-virus-travel.html>

³ http://www.who.int/whopes/quality/en/IR3535_eval_april_2006.pdf

Repellents and Sunscreen 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 bites. In general, use separate products, applying sunscreen first and then apply the repellent.

Prevent/Eliminate Mosquito Breeding Sites

- ◆ **Prevent outdoor mosquito growth.** Eliminate, clean and/or cover any areas of still water from within and around your house, including safely disposing of any containers (e.g. buckets, flower pots, and tyres) that may accumulate rainwater. Clean drains and gutters, and ensure that water tanks are covered and sealed. Keep grass short and weed-free.

For more information, please consult the following resources

1. PAHO/WHO: How to prevent mosquito breeding sites in and around your home: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=33071&Itemid=270&lang=en
2. PAHO/WHO: Consejos para evitar los criaderos de mosquitos en tu casa y patio: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=33072&Itemid=270&lang=en

3. CDC: Mosquito Bite Prevention for Travelers: http://www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf
4. CDC: Prevención de picaduras de mosquitos para viajeros: http://www.cdc.gov/zika/pdfs/fs_mosquito_bite_prevention_travelers_spanish.pdf
5. WHO recommended long-lasting insecticidal nets: http://www.who.int/whopes/Long-lasting_insecticidal_nets_November_2015.pdf

If you have any questions related to this document, please contact msdpublichealth@un.org