Remove Mosquito Eggs From Water Container Walls

— WHO —

Household members in charge of water storage.

— WHAT —

Eliminate mosquito eggs weekly from walls of frequently-used water containers.

— WHY —

Zika-carrying mosquitos lay their eggs on the interior walls of water containers.

KEY FACTS

- Frequently-used water containers are potential breeding sites for the *Aedes aegypti* mosquito.
- The female mosquito attaches her eggs to the interior walls of water containers just above the water line, and the eggs can be difficult to see.
- Research has shown that simply cleaning the container is not enough; the specific technique and materials used are crucial to reduce the number of eggs that may hatch.
- The "Untadita" procedure has been shown to be the most effective in removing eggs, but it requires a specific detergent and bleach mixture that must be rinsed off (see How to Remove Mosquito Eggs Correctly; Technique 1) .
- Households with scarce water supplies can apply only bleach to the container walls, without rinsing or emptying the containers (Technique 2).
- Scrubbing the container walls with a brush but without detergent or bleach is least effective, but it is better than not cleaning the containers at all.

HOW TO REMOVE MOSQUITO EGGS CORRECTLY

- Identify the containers in the home used to store water for short-term use, that is, several times a week.
- Once these are identified, set aside time every week to remove eggs from the container walls.
- Use one of the following four techniques, listed in order of effectiveness below, to eliminate mosquito eggs from the walls of the containers:

TECHNIQUE 1 (*UNTADITA* METHOD): SCRUB THE WALLS OF WATER CONTAINERS WITH A BRUSH AND A MIXTURE OF NON-AMMONIA DETERGENT WITH BLEACH.

1. Mix chlorine bleach with common powder laundry detergent (that does not contain ammonia) in equal parts to make a paste; do not add water.
2. Using a sponge, apply the mixture to the walls of the container, making up more mixture if necessary to cover the walls.
3. Wait at least 10 minutes for the bleach to have contact with the eggs.
4. Scrub the mixture on the walls with a hard, plastic bristle brush for at least five minutes.
5. Rinse the walls of the container with water to remove the detergent and bleach mixture.
6. Repeat these steps weekly.

Note: If preferred, empty the container before applying the mixture (it does not have to be completely empty to begin).

TECHNIQUE 2: APPLY BLEACH DIRECTLY TO WATER CONTAINER WALLS.

1. Dip a sponge in household bleach. Undiluted bleach is recommended.
2. Dab the bleach on the interior walls of the container, focusing on the area above the water line. Ensure the area above the water line is well-covered with bleach.
3. If the container is empty, pour some bleach on the bottom as well.

4. Allow the bleach to dry for 15 minutes (allow for a longer time if the bleach was diluted before applying).
5. Proceed with normal use of the water, or to fill the container as intended.
6. Repeat these steps weekly.

Notes:

- This technique can be used without emptying or rinsing the water container. It is not intended for purifying drinking water or killing mosquito larvae living in the water; it is meant to kill the eggs attached to the inside walls of the container.
- Place the chlorine directly onto the walls of the container; do not pour it into the water.
- Use only chlorine, no detergent or soap.
- There is no need to scrub the container walls.

TECHNIQUE 3: SCRUB WALLS OF THE CONTAINER WITH DETERGENT.

1. If possible, completely empty the water storage container and, also if possible, discard the water as it may contain larvae or pupae. If water is still in the container when it is scrubbed, eggs may become dislodged and sink to the bottom and may still hatch.
2. Using a brush with hard plastic bristles, with soap or detergent, scrub the walls of the container using a circular motion, especially the parts immediately above and below the line that was left by the water, to remove the eggs stuck to the walls.
3. If possible, scrub the bottom of the container to remove sediment, algae, and leaves that accumulate and that could feed mosquito larvae.
4. Repeat the process once a week.

Note: Use this technique if neither Technique 1 nor 2 can be practiced.

TECHNIQUE 4: SCRUB WALLS OF THE CONTAINER WITH A BRUSH ALONE.

1. Completely empty the water storage container and discard the water if possible, as it may contain mosquito larvae or pupae.
2. Remove eggs from the walls of the empty container using a hard, plastic bristle brush.
3. Firmly scrub the walls of the container with circular motions.
4. Rinse the container thoroughly, as eggs dislodged from the walls can fall into the container and hatch if they are not destroyed and removed.

Note: Scrubbing container walls alone is the least recommended technique, but it may be necessary if no detergent or bleach are available. It is better than not cleaning the container at all.

TIPS FOR PROMOTING THIS BEHAVIOR

- Focus on household members in charge of maintaining frequently used water storage containers.
- Encourage families to choose one day each week that suits them best to eliminate mosquito eggs from containers, so that it becomes a habit.
- Clarify how the techniques for eliminating eggs from water containers are different from general cleaning activities done in the home.
- Remind families that the specific technique and materials used are crucial to reduce the number of eggs that may hatch.
- Help families choose which of the four cleaning techniques to use by identifying whether the household can empty water containers weekly and which materials they have: hard bristle brush, power laundry detergent, and/or bleach.

SUPPORTING EVIDENCE

- Fernández E. A. et al., "Trial of a community-based intervention to decrease infestation of *Aedes aegypti* mosquitoes in cement washbasins in El Progreso, Honduras," *Acta tropica* 70(2):171-83.
- Hiscox A. et al., 2013 "Risk factors for the presence of *Aedes aegypti* and *Aedes albopictus* in domestic water-holding containers in areas impacted by the Nam Theun 2 hydroelectric project, Laos," *American journal of tropical medicine and hygiene* 88(6):1070-8.
- Leontsini E. et al., 2004. "NEgociación de PRÁcticas Mejoradas – NEPRAM (Negotiation of Improved Practices): The development of a national behaviour change strategy for community-based prevention of dengue fever in the Dominican Republic," *Dengue bulletin* 28 (Suppl.).
- Morales-Pérez A. et al., 2017. "*Aedes aegypti* breeding ecology in Guerrero: Cross-sectional study of mosquito breeding sites from the baseline for the Camino Verde trial in Mexico," *BioMed central public health* 17(1).
- Overgaard H. J. et al., 2017. "A cross-sectional survey of *Aedes aegypti* immature abundance in urban and rural household containers in central Colombia," *Parasites & vectors* 10(1):356.
- Phuanukoonnon S., I. Mueller, and J. H. Bryan. 2005. "Effectiveness of dengue control practices in household water containers in Northeast Thailand," *Tropical medicine & international health* 10(8):755-63.
- Sherman C. et al., 1998. "La untadita: A procedure for maintaining washbasins and drums free of *Aedes aegypti* based on modification of existing practices," *American journal of tropical medicine and hygiene* 58(2).
- Vannavong N. et al., 2017. "Effects of socio-demographic characteristics and household water management on *Aedes aegypti* production in suburban and rural villages in Laos and Thailand," *Parasites & vectors* 10(1):170.
- Wanti W. et al., "Container positivity and larva distribution based on the container characteristics," *International journal of public health science* 6(3):237-42.
- World Health Organization (WHO). 2003. *Guidelines for Dengue Surveillance and Mosquito Control*, *2nd ed*. Manila: WHO Regional Office for the Western Pacific.

ACKNOWLEDGMENTS

This PDF was produced as part of an online guide that was developed by the Population Reference Bureau (PRB), a partner on the Breakthrough RESEARCH consortium. The guide draws from two Breakthrough ACTION + RESEARCH reports, "Technical Specifications Content Guide for Behaviors With High Potential to Prevent Zika" and *Zika Prevention Behavior Matrix*. Reshma Naik, program director at PRB, provided technical direction for the online guide and Lori Ashford, independent consultant, developed the content based on technical reports written by staff from Breakthrough ACTION + RESEARCH. The following Breakthrough ACTION + RESEARCH staff coauthored the original technical reports and reviewed the online guide for technical accuracy: Paul Hewett and Jessie Pinchoff of the Population Council; Martha Silva of Tulane University School of Public Health and Tropical Medicine; and Gabrielle Hunter, Alice Payne Merritt, and Priya Parikh of the Johns Hopkins Center for Communication Programs. The team is grateful to Arianna Serino of USAID for her valuable input; Heidi Worley and Peter Goldstein of PRB for editorial support; Jessica Woodin of PRB for graphic design; Pamela Mathieson and N'Namdi Washington of PRB for video production; Alpha Omega Translations for Spanish translation; Mary Alice Jackson of the Population Council for Spanish review; and Automata Studios for web development. The guide is made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the terms of the Breakthrough RESEARCH Project (No. AID-0AA-A-17-00018). The contents are the responsibility of Breakthrough ACTION+RESEARCH and do not necessarily reflect the views of USAID or the United States Government.

ABOUT BREAKTHROUGH ACTION+RESEARCH

Breakthrough ACTION and Breakthrough RESEARCH are USAID's flagship programs for social and behavior change working to increase the practices of priority health behaviors for improved health and development outcomes.

SUGGESTED CITATION

Breakthrough ACTION+RESEARCH, "Effective Behaviors to Prevent Zika Transmission Online Guide" (Washington, DC: Population Reference Bureau, 2018), available at http:// www.breakthroughactionandresearch.org/zika-prevention.

PHOTO CREDIT

USAID Project: Innovative use of the care group model with mHealth to reduce Zika virus transmission and improve community engagement response in Nicaragua

FOR MORE INFORMATION, VISIT:

breakthroughactionandresearch.org/zika-prevention

USAID FROM THE AMERICAN PEOPLE

PRB INFORM EMPOWER ADVANCE

Breakthrough ACTION + RESEARCH FOR SOCIAL & BEHAVIOR CHANGE