World Health Day marks the anniversary of the founding of the World Health Organization (WHO) and draws international attention to important global health issues.

This year's theme is vector-borne diseases, with a first-time focus on dengue.

What are vector-borne diseases (VBD)?

VBD are viruses, bacteria, or parasites that are spread to people by mosquitoes, ticks, sand flies, fleas, and other blood-sucking bugs. Dengue virus, malaria, and chikungunya virus - all spread by mosquitoes - are some of the world's most destructive diseases. In North America, some of the most common vector-borne diseases are West Nile virus, Lyme disease, babesiosis, and Rocky Mountain spotted fever.

In Thailand, a health worker shows a homeowner how to cover a water storage jar with a nylon mesh net. Unless covered properly or otherwise protected, such jars provide ideal breeding places for the mosquitoes that spread dengue. Photo credit: WHO/A. Crump.

Why are vector-borne diseases an important health threat?

More than half the world's population is at risk from VBD, and they are among the most difficult of all infectious diseases to prevent and control. Not only is it difficult to predict the habits of ticks or insects, but most VBD also infect animals. Climate and weather; the environment; the mosquito, tick, and flea vectors; and animals and people infected by VBD can affect how common a disease is in a particular place. Although these diseases have the biggest impact on the world's poorest people, everyone, rich and poor, is at risk for infection.

Currently, only two VBD – yellow fever and Japanese encephalitis – can be prevented with vaccines. There is promising research on malaria and dengue vaccines, but it is uncertain when they will be commercially available. Treatments exist for some vector-borne parasites, such as malaria and leishmaniasis, but often those infected have no access to the treatments.

Currently, the best method for preventing VBD is vector control. This includes:

- Using insecticides or other chemicals to kill vectors,
- Eliminating places where the vectors can breed (like stagnant water where mosquitoes lay their eggs), and
- Reducing people's exposure to vectors (for example, through repellent use or mosquito bed nets).

A mosquito taking flight after biting a person and taking a blood meal.

A New Virus in the Americas

Chikungunya virus, which causes fever and debilitating joint pain, is primarily found in Africa, Asia, and the Pacific. Except for cases in people who had traveled to places where the virus was present, chikungunya virus infections were not found in the Western Hemisphere. However, in early December 2013, the first cases in non-travelers were detected on the Caribbean island of Saint Martin.

Since December, CDC has tracked chikungunya's explosive spread to nine Caribbean countries and South America, causing thousands of cases of infection. It will likely continue to spread in the Caribbean and Latin America. Infected travelers could even cause local transmission of the virus in the United States if mosquitoes bite infected people and then bite others.

What is CDC doing about vector-borne diseases?

The President's Malaria Initiative (PMI), led by USAID and implemented with CDC, is working in 19 focus countries in Africa. In 2012 alone, PMI procured more than 21 million long-lasting insecticide-treated nets, protected more than 30 million residents by spraying their houses with residual insecticides, and procured more than 72 million doses of treatment. Malaria's toll would be much higher without the efforts of CDC and other global partners. From 2000 through 2012, the massive scale-up of malaria prevention and treatment interventions saved approximately 3.3 million lives globally, and malaria death rates in Africa were cut nearly in half.

CDC is working on a research test for onchocerciasis, a parasitic disease that causes blindness. The OV16 test is used on blood samples to test for early infection. This will help onchocerciasis programs plan the final stages of elimination of this blinding disease.

A CDC-developed dengue vaccine, DENVax, recently completed Phase 2 clinical trials in Singapore, Colombia, Thailand, and Puerto Rico. Pending completion of analysis of safety and antibody response in children, the Phase 3 clinical trial, which will measure its ability to prevent infection in a large group of naturally exposed people, will begin in late 2014.

CDC has developed and is testing new pesticides with a unique mode of action than currently available pesticides. These could be valuable additions to the arsenal of methods to control mosquitoes and ticks.

How can people protect themselves from vector-borne diseases?

The best way to prevent vector-borne diseases is to prevent tick and mosquito bites.

- Use insect repellents
- Wear long sleeves and long pants, if weather permits
- Check for ticks daily on yourself, kids, and pets
- Shower after going outside to wash unattached ticks off your skin.

If you will be traveling outside the United States, visit a travel clinic or your healthcare provider to talk about medicines or vaccines you may need that can help prevent a vector-borne disease infection. Learn more at www.cdc.gov/travel.