Guinea Worm Eradication Program Report
July 2011

"With the international community's support, eradication of Guinea worm disease is not a question of if, but when."

—Dr. Donald Hopkins, Vice President of Carter Center Health Programs

The eradication of Guinea worm disease has been the flagship health program of The Carter Center since 1986. At that time, an estimated 3.5 million cases occurred each year in 20 countries. In the 25 years since the program’s inception, the incidence of the debilitating parasitic disease has been reduced by more than 99.9 percent. Guinea worm disease is poised to become the second human disease (after smallpox) ever to be eradicated. We are pleased to share this update on the campaign’s progress over the past six months.

In 2010, 1,797 cases of Guinea worm disease were reported, a reduction of 44 percent compared to the 3,190 cases reported in 2009. As of June 1, 2011, Ghana reported zero cases of Guinea worm disease for each of the preceding 12 months, signaling the successful interruption of transmission. This is an exciting and hard-won accomplishment for Ghana’s campaign, and it marks the beginning of a surveillance period to confirm that transmission has truly ceased. Now, Guinea worm disease persists in just the Republic of South Sudan, Mali, Ethiopia, and Chad.
Eradication without Vaccines or Medicines

Guinea worm disease is an infection caused by the parasite *Dracunculus medinensis*. Transmission occurs when people drink water obtained from stagnant sources, such as dry river-bed pools, open wells, and ponds that have been contaminated by humans already carrying the parasite. After the contaminated water is consumed, a female worm develops in the body over the course of a year without causing symptoms, growing up to three feet in length. When the worm reaches maturity, it exposes itself to the environment by causing a searing blister, shortly followed by the formation of a lesion on the skin. Although they commonly appear on the lower limbs, these lesions can form any place on the body. During the formation of the blister on the skin’s surface, the patient’s natural instinct is to seek relief by inserting the affected area in water.

Unfortunately, submersion of the affected limb in water is the worm’s signal to release its larvae. The larvae are ingested by certain species of fresh-water copepods (water fleas), which act as intermediate hosts. The copepods with worm larvae inside are swallowed by other people as they drink from the contaminated pond. The copepod is digested but the worm larvae grow and develop inside the human body, and this process allows transmission of the Guinea worm to continue. Thankfully, humans are the only host (animals cannot contract Guinea worm disease), and so once person-to-person transmission is successfully interrupted in all remaining countries, the disease will be eradicated.

Since there is no medicine to prevent this disease, stopping transmission is key to eradication efforts. To do this, the Guinea Worm Eradication Program promotes behavior change, a time-consuming and labor-intensive process. Health workers and volunteers convey prevention messages such as reminding residents to always filter drinking water and never enter a pond if a worm is emerging from their body. Household filter cloths and pipe filters (drinking straws that can be worn around the neck and are specially fitted with mesh filters) are provided and village volunteers demonstrate how to strain out the copepods. In many villages, water filtration is complemented by treating ponds with an environmentally friendly larvicide, ABATE® (donated by BASF Corporation), which neutralizes the copepods without negatively impacting humans or other wildlife. In addition to preventing person-to-person transmission, the program gives priority to providing a modicum of health care to those suffering from Guinea worm disease. Patients are encouraged to stay at case containment centers while they have an emerging worm. There, patients can be treated and their worm properly removed, with assurance that they have not contaminated any of the sources of drinking water in the area. The program relies on Guinea worm patients as well as volunteer health workers and other program staff to raise public awareness.
awareness through word of mouth, since many remote endemic areas do not have access to radio or television broadcasts.

**Hope in the Republic of South Sudan Despite Greatest Burden of Disease**

The Carter Center’s election monitoring team observed South Sudan’s January 2011 referendum, where an overwhelming majority of South Sudanese residents (nearly 99 percent) voted to become an independent nation from Sudan. The peaceful outcome of the referendum is a true cause for celebration, although sporadic violence throughout South Sudan continues to be a concern. The Guinea Worm Eradication Program depends on relative peace and security in South Sudan to allow health workers to access endemic villages. This is the only way that interventions against the disease can reach the population at risk.

Whereas Sudan reported 20,582 cases of Guinea worm disease in 2006, it reported only 1,698 cases in 2010, a reduction of 92 percent. The vast majority of cases in January to June 2011 were reported from South Sudan (98 percent), so stopping transmission in this country is key to global eradication.

“This accomplishment has improved health, agricultural productivity and school attendance for thousands of South Sudanese while training almost 30,000 Sudanese health workers and volunteers, despite handicaps of a vast landscape, poor infrastructure, a long rainy season, sporadic insecurity and exceptional mobility of rural populations among villages, farm and cattle camps,” wrote Dr. Don Hopkins, the Carter Center’s Vice President for Health Programs, in a recent editorial published in *The New York Times*.

**Mali Overcomes Insecurity, Approaches Eradication**

In 2010, Mali reported the second highest number of global cases: 57, of which 45 were contained. This was a reduction of 69 percent compared to the 186 cases reported in 2009. Mali is the last holdout of the disease in West Africa. More than 90 percent of the cases reported in 2010 occurred among members of an extremely marginalized nomadic group known as the Black Touaregs. To address this, the Mali program has increased the number of supervisors that visit nomadic camps by motorcycle or camel and has tailored prevention measures to better serve these migratory communities.

**Ethiopia Strengthens Case Surveillance**

In 2010, Ethiopia reported 21 cases of Guinea worm disease, 19 of which were contained. So far in 2011 (January through June), eight cases of Guinea worm disease have been reported in Ethiopia. These cases were all located in the Gambella region in rural, southwest Ethiopia, near the border with South Sudan. The national program focused on awareness efforts this past year by sponsoring Guinea worm disease billboards, national and local radio announcements in four languages, 15,000 posters, and 90,000 brochures. The Carter Center addresses river blindness in...
this region of Ethiopia as well, so the two programs are able to coordinate their efforts. In 2011, approximately 40,000 community volunteers trained to deliver river blindness medicine also will be trained to distinguish Guinea worms from similar-looking parasitic worms. This increased surveillance capacity will help ensure that any suspected cases are quickly confirmed and treated. As the majority of recent cases have occurred among farmers who contracted Guinea worm disease from ponds along walking paths, the program has heightened surveillance along these routes. Unfortunately, some parts of this region periodically become inaccessible due to insecurity. Another challenge is heavy rains from May to November, which can prevent access to villages during the peak Guinea worm transmission season. Finally, cross-border movement of people from South Sudan presents a serious risk for continued transmission of Guinea worm disease in Ethiopia. The Ethiopia program is strengthening cross-border collaboration and surveillance with South Sudan in the final push to bring Ethiopia’s cases down to zero.

Niger and Nigeria Honored for Achievements in Guinea Worm Eradication

In February 2011, President and Mrs. Carter hosted a special ceremony to honor Niger and Nigeria for successfully eliminating Guinea worm disease. After reporting no indigenous cases for at least 12 consecutive months, Niger and Nigeria became eligible to begin the certification process conducted by the World Health Organization. This event was attended by more than 400 distinguished guests and long-time supporters, including the ambassadors to the United States from Benin, Burkina Faso, India, Mauritania and Oman. In the meantime, The Carter Center and the international community celebrate these countries’ remarkable success.

At the Nigerian program’s inception in 1988, Nigeria was the most highly endemic country in the world with 650,000 cases. Nigeria reported its last indigenous case in November 2008. Former Nigerian Head of State General Yakubu Gowon was recognized at the ceremony for his influential role mobilizing communities and inspiring Nigerians to take Guinea worm disease seriously. Likewise, Niger’s program began in 1993 when approximately 33,000 cases were documented in 1,700 villages, and the last case was reported in October 2008.

Ghana Reports its Last Guinea Worm

Ghana was the first country on the African continent to establish an eradication program and now has achieved its long-awaited victory. The last worm was detected and extracted in May 2010. Though The Carter Center and the Ghanaian Ministry of Health made great strides in the initial years, progress against Guinea worm disease was stymied when political attention to the program waned. A turning point occurred in 2008 when national political leaders began to focus on Guinea worm disease again. This spring, Ghana concluded 12 consecutive months with zero reported cases. In celebration, Ghana is planning to open a Guinea Worm Museum to showcase memorabilia and artifacts, including the country’s last Guinea worm, and tell the story of the inspiring volunteers who led this successful public health campaign.
Unexpected Outbreak in Chad: A New Challenge for the Eradication Campaign

Chad has experienced an unexpected outbreak after reporting zero cases of Guinea worm disease for more than 10 years. In 2010, 10 cases were reported, and two cases have been reported in the first six months of 2011. Many of the cases were detected along herdsmen’s migratory paths, and none of the patients had a history of traveling outside of Chad. There is a danger that transmission is still occurring within Chad, as only one of the 12 cases reported was contained. In March 2011, The Carter Center assigned a representative to the national Guinea Worm Eradication Program secretariat in Chad who immediately began working with government staff to help revitalize the country program. During 2010 and 2011, staff trained health personnel to recognize the disease, implement surveillance, and intensify advocacy and community mobilization in districts at highest risk. The World Health Organization and the U.S. Centers for Disease Control and Prevention deployed teams to Chad to launch an inquiry into the outbreak with the Chadian Ministry of Health. This unfortunate outbreak reminds us that no country is truly safe until the last case is gone and that the disease is not confined by national borders.

Thank You for Your Support

Of the 20 countries that were Guinea worm disease-endemic when the eradication campaign began, only South Sudan, Ethiopia, Mali, and Chad continue to report cases. Globally, 187 countries have been certified by the World Health Organization as officially Guinea worm disease-free. Health workers from formerly-endemic countries remain actively involved in the Guinea Worm Eradication Program and continue to monitor for unexpected outbreaks. In the coming year, our priority will be interrupting transmission in South Sudan, where most of the remaining Guinea worm disease cases are found. Additionally, we will seek to bring the number of cases to zero in Chad, Mali and Ethiopia by the end of 2012. Formerly endemic countries will continue extensive surveillance, particularly along vulnerable border areas. With your support, The Carter Center and our partners look forward to celebrating the day when this debilitating disease is gone. As the Ethiopians say, “We shall all begin enjoying sunsets again when Guinea worm disease is eradicated!”