

ACTION AGAINST WORMS

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Children carrying water, Ghana, 2008.

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DRACUNCULIASIS: GEARING UP FOR ERADICATION

Eradication of an infectious disease is a rarity. Smallpox, which WHO officially certified as eradicated in 1979, is the only disease known to have been effectively wiped out.

Dracunculiasis (more commonly known as guinea-worm disease) is a second disease approaching eradication that was once responsible for millions of infections across Africa and Asia. During the 1980s, almost 3.5 million cases were reported from 20 countries worldwide, 16 of which were in Africa. Some 23 years on, the annual incidence of the disease has decreased by more than 99% and the number of endemic countries is now reduced to 6.

PREVALENCE OF DRACUNCULIASIS CASES, 2006–2008



* Provisional data

The provisional 2008 data reflects the tremendous progress made in Ghana, where the number of dracunculiasis cases decreased from 3358 in 2007 to 501 in 2008. Another endemic country, Sudan, has also shown considerable improvement despite challenging conditions facing implementation of control measures. Provisional reports from southern Sudan, where the disease remains endemic (the 15 states in northern Sudan have reported zero transmission since 2003), notified 3618 cases in 2008 compared with 5815 in 2007.

The decision to eliminate dracunculiasis country by country in association with the United Nations "International Drinking Water Supply and Sanitation Decade" was taken by the World Health Assembly in 1986 (Resolution 39.21). The World Health Assembly reiterated its stance in 1997, and in 2004 adopted a further resolution calling for the eradication of the disease by 2009.



World Health
Organization

WHO and its main partner, The Carter Center, are consolidating support from the international community, donors, partners and political leaders in endemic countries and communities in order to meet the eradication deadline of interrupting and containing transmission of all cases in 2009.

As the eradication deadline draws closer, it is crucial to implement a stricter method for reporting cases as their number becomes fewer. WHO is calling for uninterrupted surveillance in all endemic areas of countries at risk for a resurgence or outbreak of the disease. As the incubation period of the worm is approximately one year from the time infection occurs, any uncontained or undetected case may stall the eradication date by a further one year or more.

THE "FIERY SERPENT"

Dracunculiasis is a crippling parasitic disease caused by *Dracunculus medinensis*, a long thread-like worm. The disease, which has afflicted humanity for centuries, is transmitted exclusively by drinking contaminated water.

Guinea-worm was known to various authors in ancient India, Greece and the Middle East. It is believed that the "fiery serpent" afflicting the Israelites during the Exodus was *Dracunculus medinensis*, the guinea worm.

Dracunculiasis probably existed in Egypt and Assyrian Mesopotamia. Although it may not have occurred in ancient Greece, the disease was mentioned by some of the great Greek and Roman philosophers and physicians.



A jar containing a guinea worm, at The Carter Center in Jos, Nigeria.

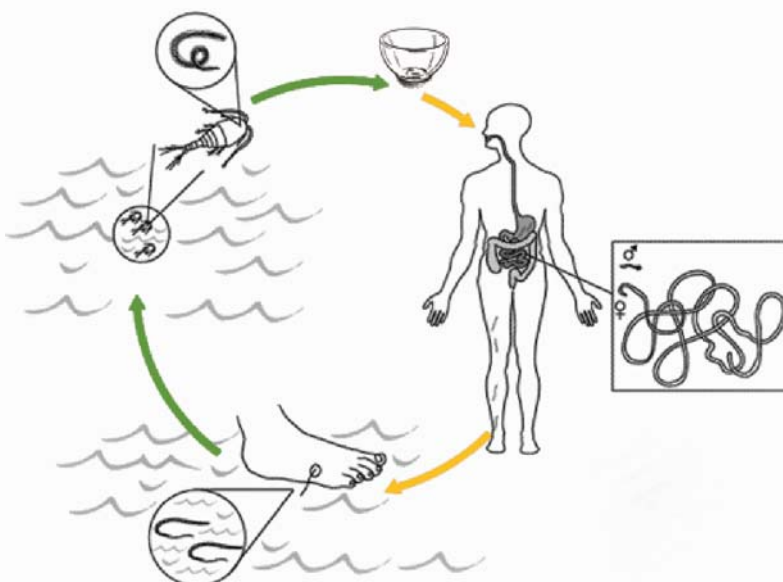
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THE LIFE-CYCLE

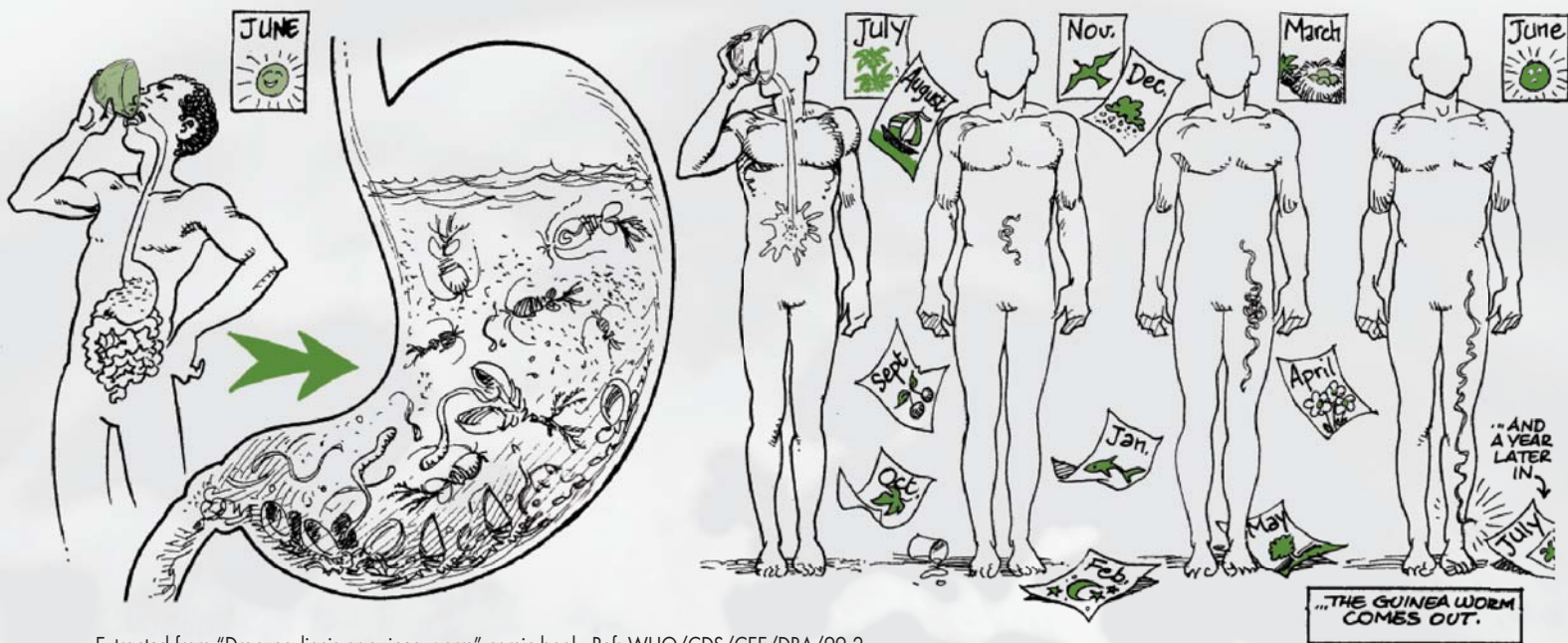
Guinea-worm disease is characterized by the emergence of a female worm (60–100 cm long) from a blister usually, but not solely, located on the lower leg. The pain from the blister becomes so excruciating that the leg feels like it is on fire, compelling the infected person to plunge it into cold water to relieve the burning sensation. This action ruptures the blister, causing the worm to release thousands of larvae (baby worms). Larvae reach the infective stage after being ingested by tiny crustaceans, or copepods, also called water fleas.

People swallow the infected water-fleas when drinking contaminated water. This action kills the water-fleas but liberates the infective larvae, which penetrate the wall of the intestine and migrate throughout the body as they mature and reproduce. The fertilized female worms migrate under the skin tissues until they reach the lower limbs, forming a blister or swelling from which they eventually emerge to pierce the skin.

The migration and emergence of the worm may take between 10 to 14 months after infection.



A simplified illustration of the guinea worm life-cycle.



Extracted from "Dracunculiasis or guinea worm" comic book, Ref: WHO/CDS/CEE/DRA/99.2

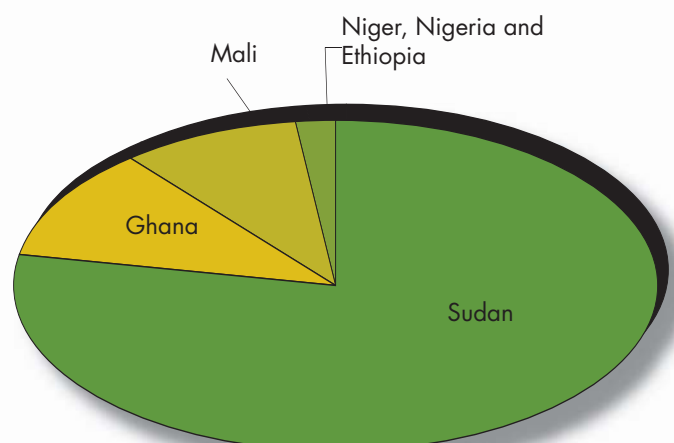
BATTLING THE WORM

The number of dracunculiasis cases in endemic countries fell from 25 217 in 2006 to 9585 in 2007. This represents a reduction of 62% in just one year.

In 2008, this number dropped further to 4619;* 78% of reported indigenous cases were from Sudan, 11% from Ghana and about 9% from Mali. Ethiopia, Niger and Nigeria reported less than 2%.

Dracunculiasis is being eradicated through a strong partnership between the governments of endemic countries and a number of organizations, including The Carter Center, the US Centers for Disease Control and Prevention, UNICEF, WHO and several nongovernmental organizations.

The 8th African Regional Conference on Dracunculiasis Eradication was held in April 2008 in Abuja, Nigeria. Delegates emphasized the need to strengthen surveillance and case containment to reach the goal set for 2009; and to integrate surveillance systems for dracunculiasis, poliomyelitis and other infectious diseases to ensure accurate reporting of cases and prevention of disease recurrence.



RESOLUTION EXTRACTED FROM WHA57.9

"Governments and organizations commit themselves to intensifying implementation of eradication activities to free the world of dracunculiasis by the end of 2009."

IMPACT

Dracunculiasis affects people in rural, deprived and isolated communities who have no safe drinking-water supply and who depend mainly on open water sources such as ponds.

Anyone drinking contaminated water is at risk of the disease, irrespective of age and sex.



**ALWAYS
FILTER DRINKING
WATER!**

In Eyingi, Nigeria, people filter their drinking-water using a fine-mesh or nylon cloth.



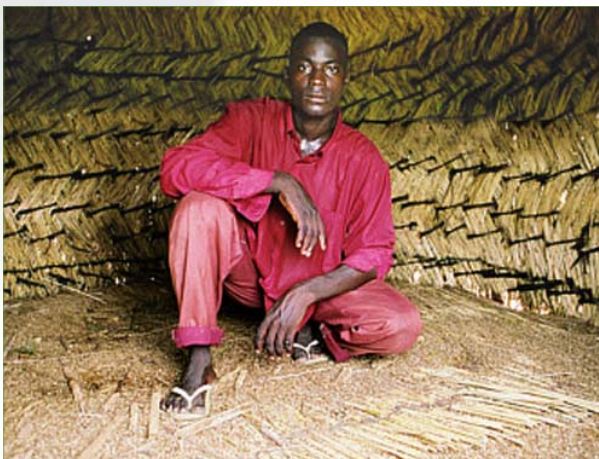
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In its final stages, dracunculiasis causes agonizing pain and incapacitates its victims. Fever, nausea and vomiting may ensue. After the worm exits the skin, the wound may disable a person for weeks or months. In rural Africa, this hampers the peak season of agricultural activities when labour is usually in great demand.

The disease can also cause malnutrition among children in households whose able members are affected.

Infected children miss months of schooling and often suffer hardship when they substitute for sick members of their households.

That is why, in Mali, dracunculiasis is commonly called the “**disease of the empty granary**”.



© WHO

Empty granary in Mali during harvest season.



© Pierre Viot/WHIB

A farmer ploughing a field in Ethiopia.

PREVENTION AND TREATMENT

SEVERAL METHODS ARE AVAILABLE TO PREVENT AND CONTROL DRACUNCULIASIS. THESE INCLUDE:

1

INTENSIFIED SURVEILLANCE AND CASE CONTAINMENT

Surveillance is perhaps the most important factor in the struggle to eradicate dracunculiasis. This begins with the village-based health worker, who is usually a volunteer trained in case detection and containment. Regular supervision and verification of cases are done at village level. All data collected are reported to the regional and eventually the national level for analysis and dissemination. Early detection of cases – preferably before eruption of the worm or at least within 24 hours of the emergence of the worm – is the first step in case containment. The village health worker should clean the ulcer promptly and try to gradually pull out the worm without using any force. The lesion should then be disinfected and bandaged to avoid further superinfection and the infected person should be prevented from wading into a water source.



© Olivier Asselin/AP

Guinea worm extracted from a child's foot in Savelugu, Ghana, 2008.

2

FILTERING DRINKING-WATER

When pond water is used for drinking purposes, dracunculiasis transmission can be interrupted by the regular use of filters made from fine-mesh or nylon cloth. This action will remove the cyclops from the drinking water.

3

TREATING POND WATER WITH ABATE®

Products such as Abate® (temephos) applied to surface sources of drinking-water, mainly ponds, will kill cyclops. Such treatment, which is safe for humans, should be carried out monthly throughout the transmission season.

4

PROVIDING SAFE DRINKING-WATER SUPPLIES

A safe supply of water is important for eliminating dracunculiasis transmission. Piped water is suitable for large populated areas. For small villages, boreholes with hand pumps are appropriate solutions. Protecting open wells with concrete or stone parapets prevents spilt water that can become contaminated by contact with already infected people from re-entering the well and re-infecting others. Small dams or ponds equipped with filtration galleries allow water to filter through layers of sand into an outside area for the water to collect in an outlet well and be drawn directly or raised by a hand pump. This prevents people from wading into the water and prevents transmission of the disease.

5

INTENSIFYING HEALTH EDUCATION AND SOCIAL MOBILIZATION

Health education is essential in promoting the use of safe water sources and the importance of filtering drinking-water. Intensifying social mobilization activities in endemic areas is also important in disseminating information and motivating people to collaborate towards eradicating the disease.

PREVENTION

ENDEMIC COUNTRIES IN 2008

Ethiopia

There were 41 reported cases in Ethiopia during 2008. This is a setback given the zero indigenous cases reported from July 2006 to February 2008.

Ghana

In 2007, the national eradication programme reported 3358 cases from 407 endemic villages. This represented a 19% reduction compared with the 4136 cases reported to WHO in 2006. Most of the cases in 2007 were reported from the northern regions of the country, where a collapse of the water supply system may have caused the problem. Thanks to the concerted efforts of the Ghanaian authorities, the numbers were drastically reduced in 2008 when only 501 cases were reported from 131 villages.

Mali

Since 2006, the annual number of cases has remained above 300, with a substantial increase over the past two years. In 2008, 417 cases were reported compared with 313 in 2007. The reason is due to outbreaks of cases that remained undetected and uncontained. Many new regions became infected due to movement of people. This mobility across Mali also poses a threat to neighbouring countries.

Niger

The national programme reported 14 cases in 2007, of which 11 were indigenous and three originated in Mali. Compared with the 108 indigenous cases reported in 2006, a reduction of 90% occurred in 2007. Three cases were reported in Niger in 2008, including one imported from Mali.

Nigeria

The national programme reported 73 dracunculiasis cases from four main villages in 2007. An unexpected outbreak occurred in Enugu State, that went unreported until January 2007. Once detected, urgent containment measures were initiated and a containment rate of 60% was achieved. As of March 2008, 37 cases had been detected, all of which were linked to the 2007 outbreak. In 2008, 38 cases were reported, all of which were successfully contained.

Sudan

In 2007, there were 5815 reported cases. This represents a 70% decrease from the 20 582 cases reported in 2006. No indigenous cases have been reported from northern Sudan since 2003. Provisional figures from the country's 10 states in southern Sudan indicate a further decrease from 5815 cases in 2007 to 3618 in 2008.

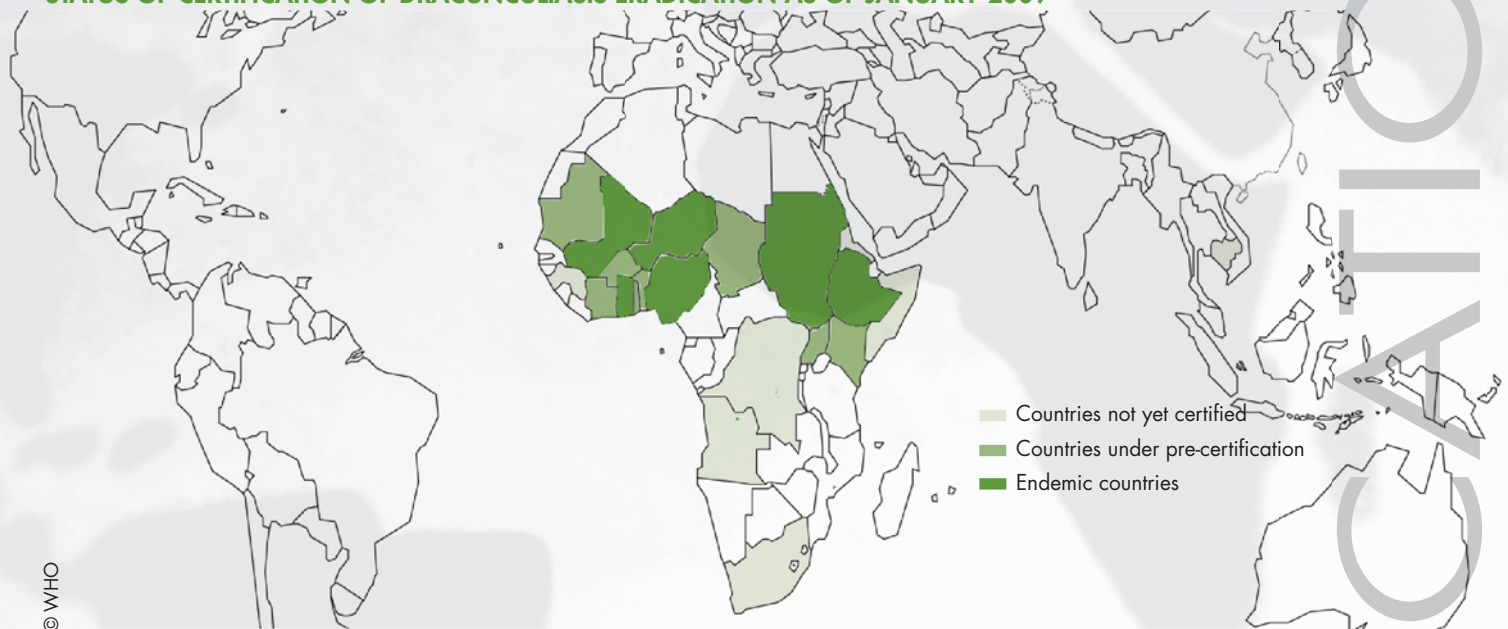


COUNTRIES IN THE PRE-CERTIFICATION STAGE

In 1995, WHO established an independent International Commission for the Certification of Dracunculiasis Eradication comprising 12 public health experts from the six WHO regions. The Commission meets as and when necessary, usually at WHO headquarters in Geneva, to evaluate the status of transmission in countries applying for certification of dracunculiasis eradication and to recommend whether a particular country should be certified as free of transmission.

A country reporting zero cases over a period of 12 consecutive months is believed to have prevented transmission of dracunculiasis and is classified as being in the pre-certification stage. The eight countries in the pre-certification stage are Benin, Burkina Faso, Chad, Côte d'Ivoire, Kenya, Mauritania, Togo and Uganda. As of January 2009, 180 countries including some territories were certified free of dracunculiasis transmission.

STATUS OF CERTIFICATION OF DRACUNCULIASIS ERADICATION AS OF JANUARY 2009



To be declared free of dracunculiasis, a country needs to have reported zero transmission and maintained active surveillance for at least three years. After this period, an international certification team visits the country to assess the adequacy of the surveillance system and to review records concerning investigations of rumoured cases and actions taken. The team also visits a sample of formerly endemic communities.

Indicators such as water supplies in infected areas are examined, and investigations are carried out in villages to confirm the absence of transmission. The risk of reintroduction of the disease to the country is also assessed.

Finally, a report is submitted to the International Commission for the Certification of Dracunculiasis Eradication for review.

Five countries have reported no indigenous cases for the past 3–4 years: Benin, Chad, Kenya, Mauritania and Uganda. Precertification activities are ongoing in these countries. The next meeting of the Commission is scheduled to take place at WHO headquarters in 2009.

"The eradication of a disease is the ultimate contribution to sustainable health development. We have two such initiatives under way: for polio and for guinea-worm disease."

Dr Margaret Chan, Director-General, WHO, May 2007

CHALLENGES

The target of eradicating dracunculiasis within a few years is feasible. A combination of international goodwill, volunteerism, scientific expertise and money has contributed to bringing relief to some of the remotest communities in Africa.

Preventing transmission in the remaining endemic areas of Mali and Sudan is the most daunting challenge now facing the eradication campaign. Both these countries have experienced sporadic periods of civil unrest and insecurity that have seriously hampered containment of the disease.

These communities are nomadic, moving seasonally with their cattle in search of water and pasture. This makes it more difficult to determine where and when transmission is occurring. Strict surveillance measures need to be taken by both countries to ensure prompt case detection and prevention of transmission.

We are now in the final phase of the global campaign to eradicate dracunculiasis.

To stay on target, national and international leaders need to ensure:

- ▶ that surveillance activities and programmes in the remaining endemic countries are fully enforced;
- ▶ high levels of political commitment and goodwill until successful completion of the campaign – there is no room for complacency;
- ▶ improved management of local and national eradication efforts;
- ▶ thorough implementation of all interventions in a timely manner;
- ▶ maintained momentum when case numbers are low;
- ▶ sufficient financial and material resources are available in a timely manner.



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A nomadic community in Ethiopia, 2008.

"... we are on the brink of eradicating guinea-worm disease, and funds are being secured to ensure this happens ...".

Dr Margaret Chan, Director-General, WHO, May 2008

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We very much hope that 'Action Against Worms' is both enjoyable and informative. If you have any comments on existing issues or suggestions for areas you would like to be covered in the future, please do not hesitate to contact us by e-mail at wormcontrol@who.int



World Health Organization

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