

Photo by S. SALTSTEIN/Magnum

Brazilian Indians bathe in river that breeds blackflies which carry the worm larvae that cause river blindness.

Speaking Of:



Merck & Co.

# River Blindness

Six years after approval of a drug capable of warding off blindness for millions in developing countries, new statistics gathered for the World Health Organization show that the battle is far from won.

The drug, called Mectizan, is manufactured and made available without charge by Merck & Co., and according to the World Bank, it has saved an estimated 150,000 people in Africa and Latin America from losing their sight to a disease called onchocerciasis—better known as river blindness.

But the new WHO statistics indicate that 2 million more people are now infected with the disease than in 1987, when Mectizan became available, even as the number of people still at risk has declined slightly.

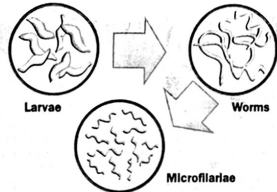
The problem is distribution, according to the River Blindness Foundation, which estimates that it will cost as much as \$200 million and take as long as 15 years to provide the drug to all who need it.

Merck estimates that 8 million people will be treated this year, but that is only a fraction of the 84 million in 34 countries who are either infected already or in danger of getting the infection that causes river blindness. Those in danger live in areas infested with blackflies, which are found along fast-moving rivers and transmit the disease.

**HOW IT SPREADS**



**1** A blackfly carrying larvae of *Onchocerca volvulus* worms bites a victim and transmits the infection.



**2** The larvae grow into groups of string-like worms that live wrapped up in a bump under the skin. Adult female worms produce thousands of tiny microfilariae for approximately eight to 12 years. Unlike the adults, the microfilariae migrate throughout the victim's skin, causing skin disfigurement and intense itching.



**3** The worms can cause permanent damage when they reach the eyes, impairing sight and finally causing blindness. When another blackfly bites the victim and then bites an uninfected person, it begins the cycle of infection again.



Blackfly larvae and pupae cling to submerged vegetation in Africa and some areas of the Americas.



Examining skin samples and blood smears for disease.



Doctor in Brazil takes a skin biopsy for diagnosis.

**THE DISEASE**

Onchocerciasis (pronounced on-ko-sir-KEYE-a-sis) causes intense itching, disfiguring skin conditions and, for about half of those stricken in the most dangerous areas, eventual blindness.

The worm that causes this parasitic disease is carried from person to person by an insect that looks like a common housefly. Blackflies nest near rivers in parts of Africa and more limited areas of Latin America and the Middle East. Tiny microfilariae, which are one of the developmental stages of the *Onchocerca volvulus* worm, cause most of the damage. About the size of the dot on this letter i, they live by the millions in the skin and eyes of sufferers.

Blindness results from repeated biting by infectious flies, which increases the concentration of the parasite and its damage. People blinded by the disease are usually at least 20 years old and longtime residents of infested areas.

A strain of onchocerciasis found in the Middle East does not cause blindness. Before Mectizan was approved for this use, the only treatment for river blindness was insecticide spraying for the blackfly, inefficient and dangerous chemotherapy or surgical removal of adult worms from under the skin of patients—impractical for treating large populations in poor areas.

**THE DRUG**

Scientists are not sure of the precise way that Mectizan works, though it causes the microfilariae to become paralyzed and then die. A single dose of the drug—usually 1½ tablets—is sufficient to kill almost all the microfilariae living within a victim. But the dose must be repeated annually because the drug does not kill the adult worms that produce more microfilariae.

Because it kills almost all of the microfilariae living in the skin of sufferers, Mectizan also inhibits transmission of the disease by the blackfly. While it can stop the progression of onchocerciasis and improves the skin, Mectizan cannot reverse eye damage.

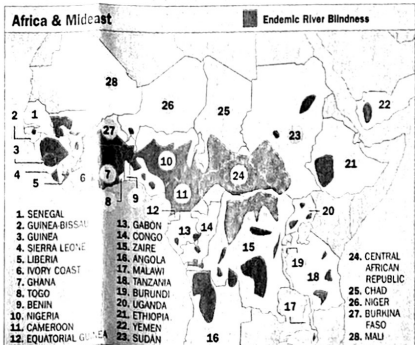
**DISTRIBUTION**

Although the drug is donated by its manufacturer, Merck & Co.—which also pays to ship the tablets to nations with Mectizan programs—government and private organizations must pay to distribute and administer the drug within each country. This is costly because river blindness is usually found in remote rural areas and because of the expense of providing the staff and facilities for a new health program. And communities where river blindness is endemic are especially poor. Individuals can apply for Mectizan to treat small groups, but most people are treated through an organization that serves the entire community.

**THE PROGNOSIS**

There has been an increase since 1987 in the number of people with river blindness because experts are still far behind in establishing Mectizan programs in all of the areas where people are at risk. Even those whose being treated with the drug are still counted as infected because Mectizan does not kill adult worms

living in patients. Over time, however, the number of new infections is expected to decrease thanks to the spread of Mectizan treatments and also to insecticide spraying in some areas where blackflies live—a program begun in 1975.



**SIX-YEAR PICTURE**

Region	Total at Risk		Already Infected	
	1987	1993*	1987	1993*
Africa	80.3 million	79.8 million	17.6 million	19.5 million
Latin America	5.3 million	4.1 million	0.1 million	0.2 million
Middle East	0.06 million	0.06 million	0.02 million	0.02 million
TOTAL**	85.7 million	84.0 million	17.7 million	19.7 million

\*Figures for 1993 are either preliminary estimates or based on extrapolations from 1987 data.  
 \*\*Totals may not add up exactly due to rounding.  
 Sources: Monthly Bulletin of Statistics, World Health Organization and the River Blindness Foundation.

Sources: Color Atlas of Ophthalmic Parasitology, Physiology of the Eye, the Eye Center, the River Blindness Foundation, Merck & Co. and Mectizan Expert Committee.