

**“By the use of biological means, mosquito larvae are eliminated in order to prevent them from developing into adult mosquito thus spreading malaria.”**

In 2004, by using this strategy, the Swiss insect researcher Dr. Hans Rudolf Herren together with the Swiss Development Agency (SDC) and BioVision started a malaria pilot project in the Nyabondo, Kenya.

## No Mosquitoes means no malaria!

The female Anopheles mosquitoes lay their eggs in standing water. The eggs hatch into larvae and later become mosquitoes. They then fly to the nearest settlement in search of food where they sting people and suck blood. In the process, they spread the deadly malaria parasites.

In Europe and the USA, mosquitoes are brought under control by using a natural protein which is produced from a bacterium called *Bacillus thuringiensis israelensis* (Bti). The larvae are destroyed but other organisms are left unaffected. BioVision is now organising malaria projects based on these findings. What the industrialised countries use to protect themselves against annoying mosquitoes, can in Africa save lives.



Bti is now being deployed in the pilot project in Nyabondo. The affected people will be informed on the relationship between standing water, mosquitoes and malaria. At the same time, they will be supplied with mosquito nets.



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## Fight the malice at its roots!

In Malindi at the Kenyan coast, every third patient in hospital suffers from malaria.

The local self-help group receives professional support to control mosquito: Staff members from the BioVision project show the people where the mosquito breeding grounds are and how they can eliminate mosquito larvae without using chemicals. Often these places seem to be insignificant or hidden. Such places include pools of water collected under leaking water-pipes, rain collecting water drums placed behind the house or pools of water in ditches.



**Nelly Njeru** who is the co-coordinator of the Malindi self-help group PUMMA says: “We have almost 200 mosquito scouts. During their free time, they find out where the mosquito breeding grounds are, which we then destroy by spraying with insecticide. This procedure has convinced the people as they see that something is being done right away to fight against mosquitoes and malaria”.



**Kurt Aeschbacher**

TV presenter,  
UNICEF Ambassador, Switzerland

“Small children and pregnant women suffer the most from the deadly malaria. When this dangerous tropical disease is finally beaten, the lives of the most vulnerable in Africa will be greatly improved.”



## Help for Self Help!

With the fight against the mosquito causing malaria, BioVision is tackling the malice at its roots. These sustainable malaria prevention projects in Nyabondo and Malindi should be extended to other parts of Africa.



## Stop Malaria - now!

“The BioVision projects complement the mosquito net campaign promoted by WHO and the efforts by research institutes, which for years have been looking for an effective vaccine and drug against malaria. I am convinced that with united strength, we can win against this biggest killer among the tropical diseases. Help us with your donation!”

Dr. Hans Rudolf Herren, President BioVision

## Thank you for your help!

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## Stop Malaria!



**Micheline Calmy-Rey**

Swiss Foreign Minister

“The agony that malaria causes goes beyond imagination. Every minute, two children die from this malignant disease. That adds up to 3,000 deaths every day and more than a million per year. Well known Swiss researchers are trying to fight this disease which is the worst of the tropical diseases. Their endeavors deserve our full support. I hope the suffering people will as soon as possible be set free from this deadly scourge!”

# Every 30 seconds a child dies of Malaria!



With more than one million child victims in Africa, malaria is the worst killer among the tropical diseases. This drama could be prevented. But the fight against the disease is unfortunately not among the top priorities of the developed countries.

## Death is hiding in a 1000 ponds

Hot days, mild nights, rainy seasons, pools of water, thick vegetation and a dense population. These are the ideal living conditions that allow the Anopheles mosquitoes in the tropics and sub-tropics to thrive.

The female Anopheles mosquito requires blood in order for it to lay eggs which it easily sucks from people. In the process of sucking blood from humans, the mosquito might transfer the deadly malaria parasite. Every year, about 500 million people are infected with malaria world wide and the African continent is worst affected.

The people in the endemic areas (areas that are permanently affected) are with time able to acquire certain immunity against malaria. When the disease breaks out, they can thus be cured. But for that, they must quickly identify the disease and immediately be treated with effective medication. Otherwise, the parasites in the blood would rapidly increase causing bouts of fever, headache, nausea, tiredness, shivers and sweating. These attacks can lead to brain damage, anemia and coma and can eventually cause death. The most affected are small children and pregnant women whose immune systems are weak and powerless against the malaria parasites. Unlike travelers from the northern hemisphere, the affected people in Africa cannot afford effective medication as it is not available to them or is too expensive.



**Mzee Petro Omwasi Okech** (75 years)

"Since we came here 13 years ago, the mosquitoes have not allowed us any peace. 15 of my grandchildren have died from malaria. The last burial was at the beginning of this year. We don't know anymore what we should do. Malaria is depriving us of all hope".



**Dr. Wycliffe Mogoia**

Director, Kisii District Hospital, Kenya

"We know the causes of Malaria. Treating the disease should only be the last resort. What we need is effective malaria prophylaxis".



## Over stretched hospitals

When the Anopheles mosquito in Kisii District (Kenya) suddenly proliferates in huge numbers, malaria epidemics frequently occur. The District hospital is swamped with patients. Every morning hundreds of mothers come with their sick children in the hope of receiving help.

## One can not defeat malaria alone.

But together, it is possible to shove back this senseless suffering and death.

Malaria parasites are con artists who have managed to outsmart the human immune system and even developed immunity against some drugs.

In Africa, most of the first generation medicines against malaria are no longer effective. In addition, new medication against malaria is all too soon useless due to the adaptability of the malaria parasites. But there is hope.

At research institutions like the Swiss Tropical Institute, new inexpensive and effective drugs against malaria are being developed. The Basel researchers reckon that their two new drugs would only cost half the price of what the current malaria prophylaxis costs and that in about three years, the medication would be on the market.

Together with the Roll Back Malaria Campaign, WHO encourages the distribution of mosquito nets in malaria infested regions.

## BioVision: Aiming at the killers

In the village of Nyabondo, Western Kenya, BioVision's malaria project manager Dr. Francois Omlin together with his team is restoring hope to the community. Through the project, the people receive mosquito nets and are taught about malaria. Most importantly though, Dr Omlin shows the people how the breeding areas can be controlled and how one can make the infectious mosquito harmless.

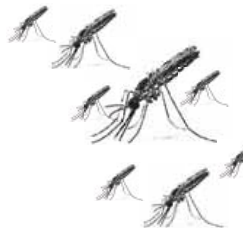
Pools of water infested with Larvae are treated with *Bacillus thuringiensis israelensis* (Bti),

which is a naturally occurring bacterium harmful to mosquito larvae. Dr. Francois Omlin says, "We monitor the spread of mosquitoes so as to reduce the parasites already in the breeding areas by using Bti." It's also important to eliminate smaller breeding grounds in human settlements like small pools of water lying around or where garbage is deposited. In this regard, the affected population has to take an active roll.

## The wrong way

### Fall back in the age of DDT

In Africa, DDT has recently been used again on a large scale to fight malaria. This poisonous insecticide which in the middle of the last century posed as the solution to all insect problems, turned out to be a big failure. DDT residue was enriched in the fat of birds, mammals and humans. The insects developed immunity against the poison. The use of DDT was in 1972 banned in Switzerland.



The involvement of the local population is necessary for a successful and long lasting fight against malaria. This will enable them to learn how to apply the correct means and to take control of the situation after the project has been completed.

Professor Peter Lüthy from the Swiss Federal Institute of Technology in Zurich (ETH Zurich) who is an internationally known specialist in Bti and mosquito control works as adviser for the BioVision project. "I regard it as an important task for us scientists, to transfer effective technology to developing countries. When we share our knowledge, then the people in Africa are able to help themselves."