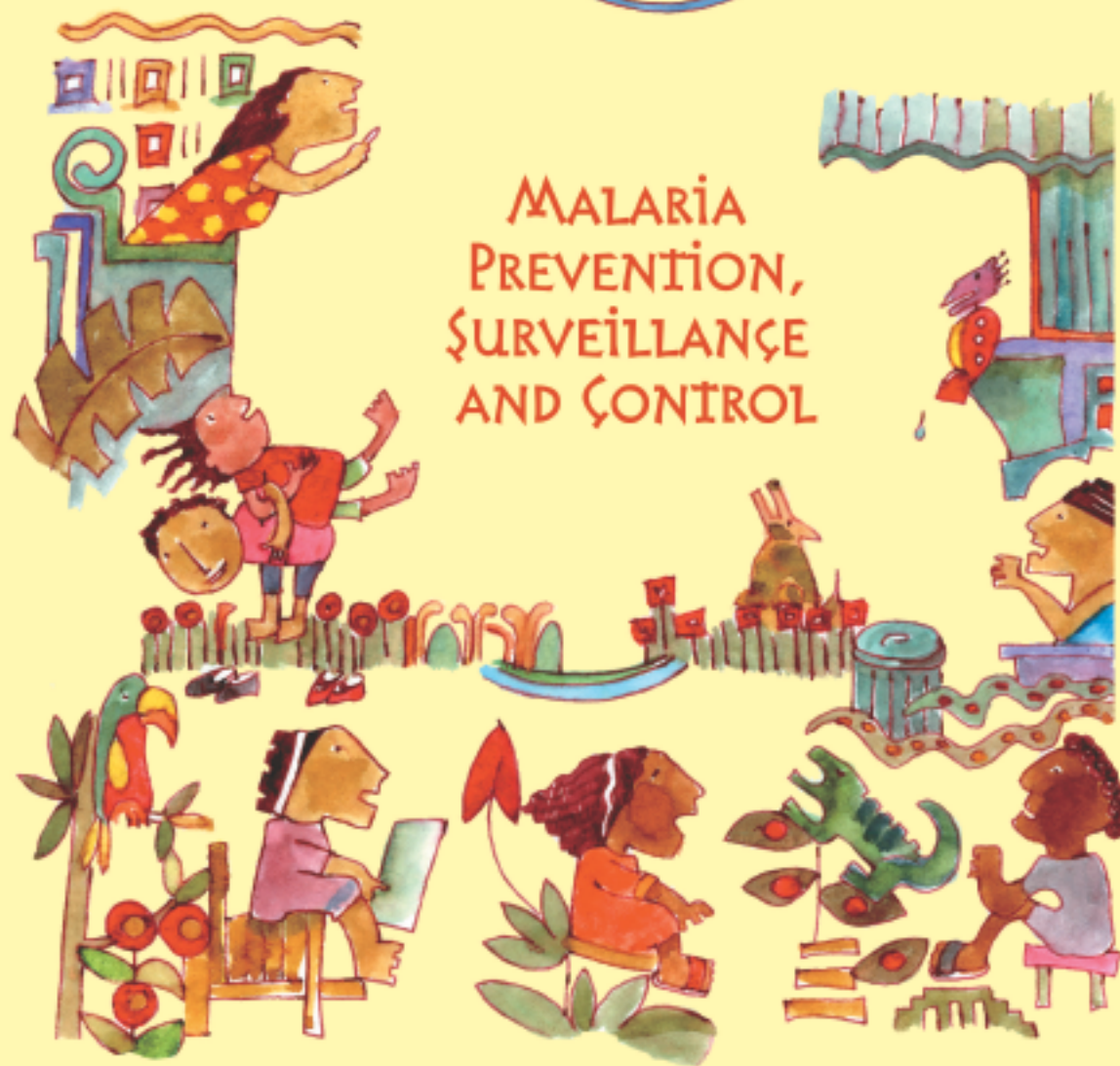


Handbook for Leaders and Community  
Health Workers of Indigenous  
and Afro descendant Peoples



## MALARIA PREVENTION, SURVEILLANCE AND CONTROL



DDT and Persistent Organic Pollutants (POPs)-free  
Integrated Malaria Control

**Sustainable Development and Environmental Health Area**

Regional Action Program and Demonstration of Sustainable Alternatives for  
Malaria Vector Control without using DDT in Mexico and Central America  
DDT/UNEP/GEF/PAHO PROJECT

**Health Surveillance and Disease Management Area**

Regional Malaria Program

**Technology and Health Services Delivery Area**

Health Program of the Indigenous Peoples of the Americas

***Pan American Health Organization***

***World Health Organization***

December, 2007



MALARIA  
PREVENTION,  
SURVEILLANCE  
AND CONTROL

Handbook for Leaders  
and Community  
Health Workers of  
Indigenous and Afro  
descendant Peoples

## FOREWORD

The adverse effects of the use of DDT and other persistent insecticides for both human health and the environment, prompted the Pan American Health Organization (PAHO), together with the United Nations Environment Program and the Global Environment Facility (UNEP/GEF) to undertake, since 2003, the implementation of the Regional Action Program and Demonstration of Sustainable Alternatives for Malaria Vector Control without using DDT in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama (DDT/UNEP/GEF/PAHO Project).

Within this framework, the multiple dimensions of malaria control have set in motion efforts and commitments not limited to the health sector. These initiatives include society as a whole and, particularly, population sectors most directly affected by this disease, especially the indigenous, afro descendant and mestizo communities living in the Project's pilot areas.

Thus, respect for cultural diversity, the empowerment of participating communities and local capacity-building have been key elements in the implementation of the Project's integrated actions.

This Handbook for Leaders and Community Health Workers of Indigenous and Afro descendant Peoples for DDT-free malaria prevention, surveillance and control is part of a process geared

towards finding sustainable solutions based upon open communication and the concerted action of institutions and communities. While contributing to reduce the number of malaria cases, it is aimed at improving the quality of life of disadvantaged populations by using environment-friendly malaria vector control alternatives.

This Handbook is the result of a collective effort based on the participation and contribution of, as well as the validation by, indigenous, afro descendant and mestizo communities of the Project's area of influence, community leaders, community health workers, public health authorities and PAHO staff from Central America. It benefited from the technical cooperation between PAHO Sustainable Development and Environmental Health Area and the Health Program of the Indigenous Peoples of the Americas of the organization's Technology and Health Services Delivery Area.

The effective training of leaders, community health workers and promoters, and community groups will contribute to restore the individual and collective decision-making power of community members regarding their health and other conditioning factors which have an impact on their human development. We are, thus, pleased to publish this Handbook which will undoubtedly be enriched with feedback from readers who use it with critical awareness and adapt it to their specific realities, needs and strengths.

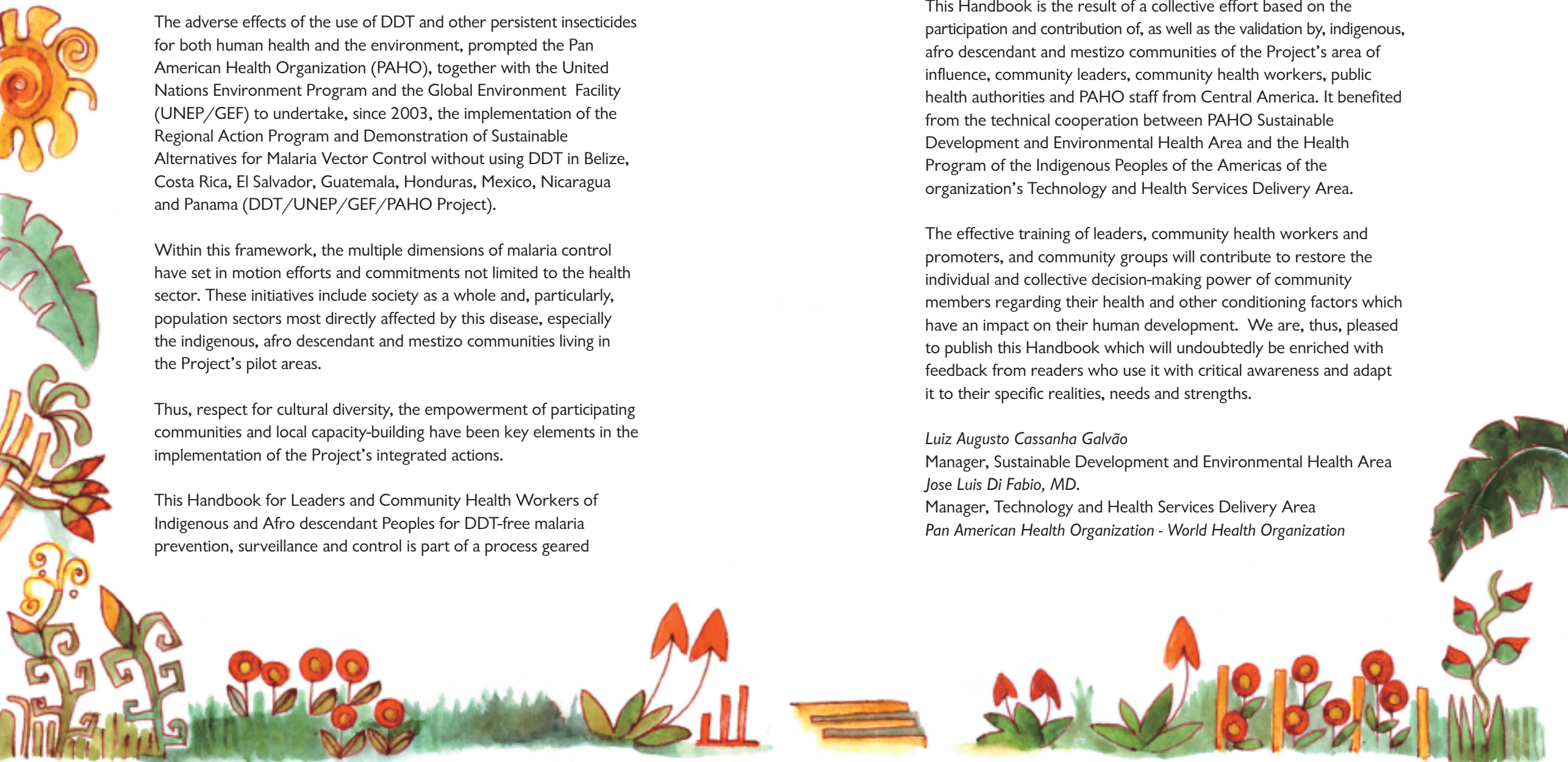
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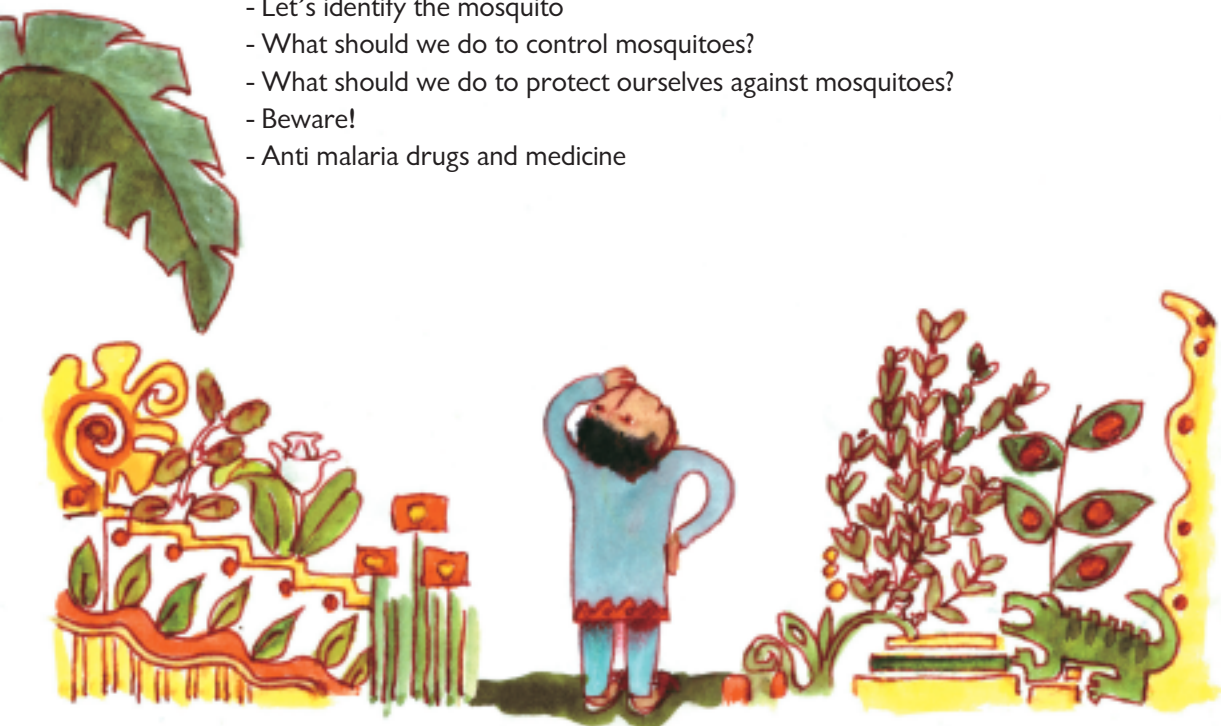
*Pan American Health Organization - World Health Organization*



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## INTRODUCTION

Dear leaders, community health workers and promoters.

We are pleased to publish this handbook to support you in your efforts in malaria prevention, surveillance and control, thus contributing to improve the quality of life of your communities.

**The content of this handbook has been organized on the basis of the knowledge and experience gathered in your communities.**

We hope that each one of you will efficiently put in practice the contents of this handbook in order to achieve our common goal:

**to control malaria**



## INDIGENOUS PEOPLES IN THE AMERICAS

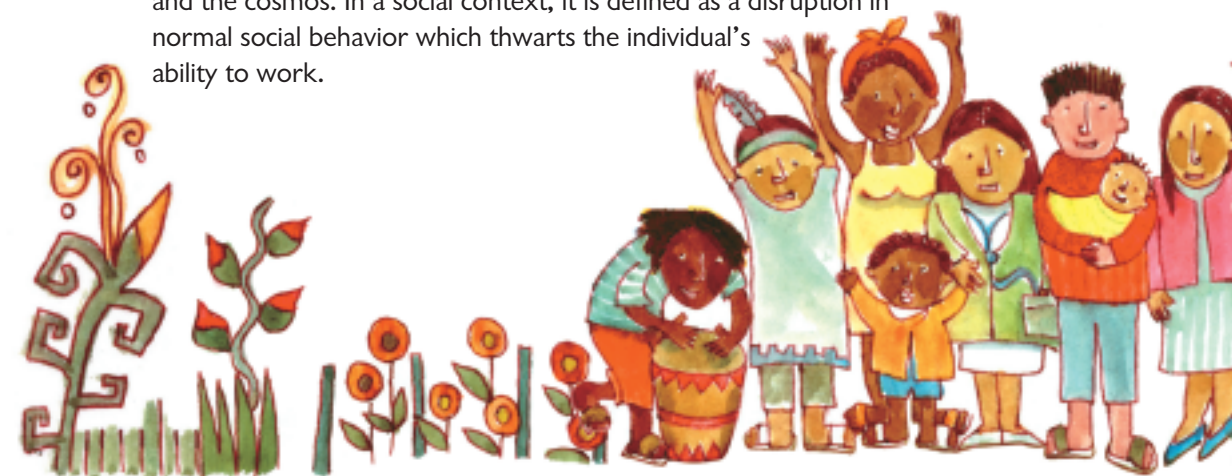
It is estimated that between 45 and 50 million indigenous people live in the Americas. They belong to more than 600 peoples in 24 countries. Indigenous peoples, together with afro descendant and mestizo populations, and other ethnic groups form the foundations of the multicultural, multiethnic and multilingual society of the Region.

### Indigenous peoples vision of health

The World Health Organization (WHO) defines health as a general physical, mental and social wellbeing not limited to the mere absence of disease or illness. Indigenous peoples define health as a state of overall wellness that includes the spiritual dimension. This is, the harmonious convergence of all health-related elements, the individual right to understand and control one's life, and the right to the "peaceful coexistence of human beings and nature, as well as with others and with themselves, with the aim of achieving overall wholeness, together with spiritual, individual and social fulfillment and peace."

In other words, when health incorporates paradigms of the indigenous vision, it materializes in a dynamic interaction between and a natural balance of components inherent to the individual (physical, mental, emotional and spiritual) and the collective essence (ecological, political, economic, cultural, social and, once again, spiritual) of existence. This concept of overall health encompasses the biological, psychological, social and spiritual wellbeing of an individual and of society/community, placed on equal footing.

Disease upsets the balance between human beings, spiritual beings, nature and the cosmos. In a social context, it is defined as a disruption in normal social behavior which thwarts the individual's ability to work.





## MALARIA IN THE WORLD

- Malaria is a disease and a global problem.
- Malaria is present in 21 countries in the Americas.
- Indigenous and Afro descendant peoples are among the most seriously affected populations.

- For indigenous peoples, borders between and within countries do not exist.
- Neighboring peoples and countries must cooperate in order to solve the malaria problem.
- The governments of American countries value the cultural diversity of indigenous and Afro descendant peoples. They are determined to improve the living and health conditions of these communities. One of their commitments is to join forces to fight malaria in areas inhabited by indigenous and Afro descendant peoples.

### Malaria and indigenous peoples

Indigenous populations are seriously affected by malaria as illustrated by the maps found in the following pages.

#### Several Causes

- Community life has significantly changed in recent years.
- Community populations have increased with people who have come to work with timber and oil companies.
- Logging has destroyed forests.
- Water sources have been polluted.

#### These changes have brought about or increased a number of diseases, malaria amongst them.

- Community members used to know how to treat and cure diseases; now, it would seem that:
  - Diseases are stronger - we apply less our traditional knowledge.
  - We need new knowledge.
- Because we are poor, we are unable to feed or educate ourselves well.
- When someone is weak, any disease becomes more serious and tends to aggravate without the required care.
  - Sometimes, health centers are far too distant.
  - Sometimes, there is no money to go to a health center or to buy medicines.
  - Sometimes, when you finally reach the health center: •it is closed; •the health staff is rude; they do not understand or respect the culture of our people; •they do not understand what happens because they do not speak our indigenous language.



GEOGRAPHICAL LOCATION



Source: PAHO, 2007

POLITICAL DIVISION OF BELIZE





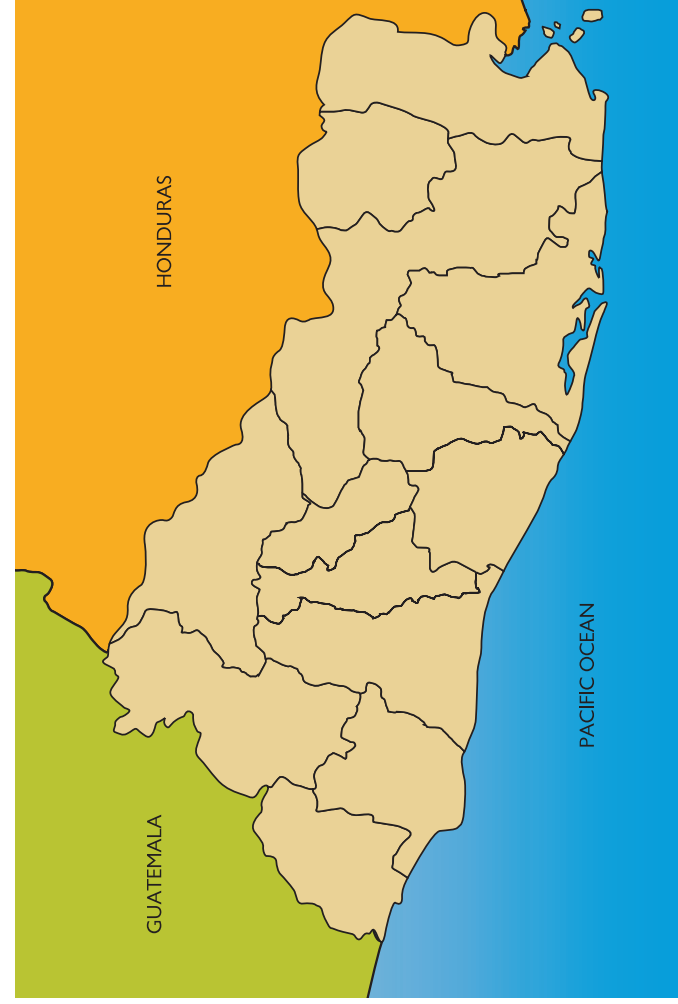
## POLITICAL DIVISION OF COSTA RICA



GEOGRAPHICAL LOCATION



## POLITICAL DIVISION OF EL SALVADOR

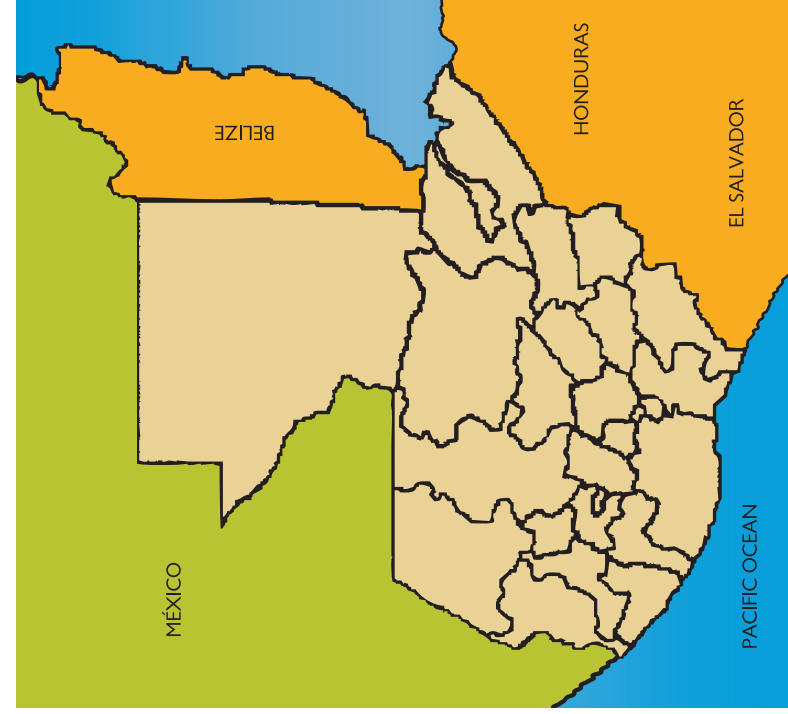


GEOGRAPHICAL LOCATION



Source: PAHO, 2007

POLITICAL DIVISION OF **GUATEMALA**



Source: PAHO, 2007

GEOGRAPHICAL LOCATION



## POLITICAL DIVISION OF HONDURAS

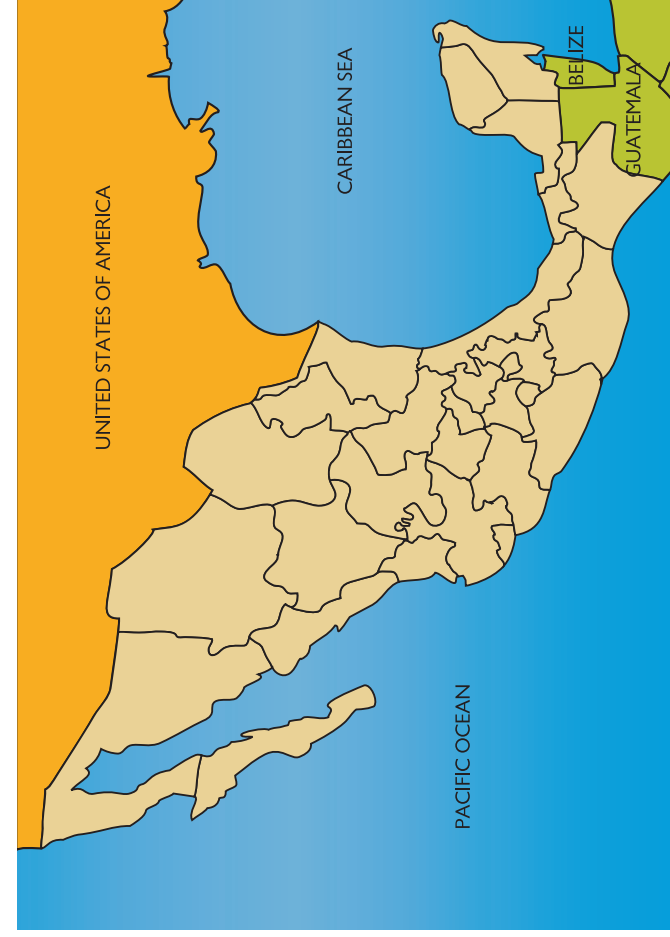


GEOGRAPHICAL LOCATION



Source: PAHO, 2007

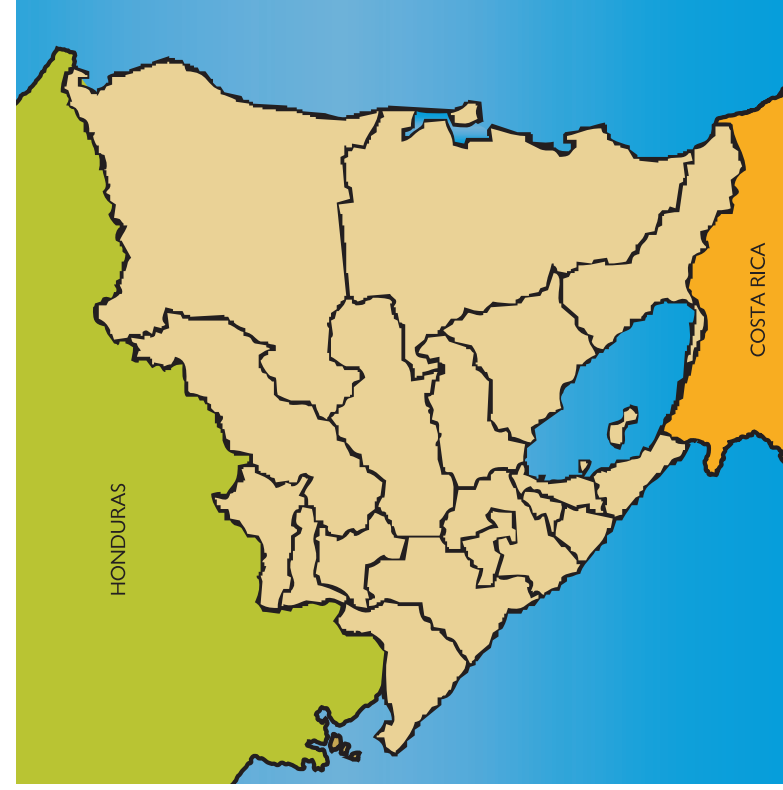
## POLITICAL DIVISION OF MEXICO



GEOGRAPHICAL LOCATION



POLITICAL DIVISION OF NICARAGUA



Source: PAHO, 2007

GEOGRAPHICAL LOCATION



POLITICAL DIVISION OF **PANAMA**



GEOGRAPHICAL LOCATION



## WHAT DOES A PERSON FEEL WHEN HE OR SHE GETS MALARIA?

- The person does not feel well and might experience:
  - Tiredness
  - Bodyaches
  - Headaches
  - Coughs
  - Fevers
  - Chills
  - Heavy sweating
  - Vomiting and diarrhoea
  - Yellowish skin and eyes (jaundice)
  - Dark brown urine (like Coca Cola)
  - Convulsions
  - Unconsciousness
  - **The person could die**

### Remember:

- Depending on how serious the disease is, a person with malaria could experience those symptoms.
- At the onset of the first symptoms, the person should approach the community leader, the community health care worker or promoter, or go to the closest health center.

### Malaria is known by several names

- In Mexico, it is known as: *paludismo*.
- In Central America, it is known as: *malaria*.
- In Brazil, it is known as: *paludismo*, *impaludismo*, *maleita*, *seza*, or *tremendeira*.
- In Bolivia, it is known as: *tremadera*, *talatala*, *chujchuj*, or *tembladera*.



## THE SITUATION

- Several communities have received malaria training. They associate the disease with the bite of an infected *Anopheles* mosquito. Others associate malaria symptoms with manifestations explained by local culture. Therefore, it is important that the community and, particularly traditional medicine practitioners (indigenous wise people) participate in the fight against malaria.
- Together with health staff's knowledge, it is important to respect and understand communities' culture and wisdom.
- Indigenous peoples' traditional knowledge plays an extremely important role in understanding how we can work together to improve health conditions in our communities.

### WHAT IS MALARIA?

Malaria is a disease caused by parasites and transmitted by the *Anopheles* mosquito.

- The parasites that cause malaria are called *Plasmodium*.

#### There are several types of malaria parasites:

- *Plasmodium vivax* which causes ordinary or benign malaria.
- *Plasmodium falciparum* which causes malignant malaria.



**Mosquitoes carry many diseases. That is, they act as vectors for many diseases. The malaria vector is the female *Anopheles* mosquito.**

- Malaria vectors feed on blood.
- Malaria parasites are introduced to human bodies and leave them through *Anopheles* mosquitoes bites.
- A healthy person gets sick after having been bitten by an *Anopheles* mosquito infected with malaria.

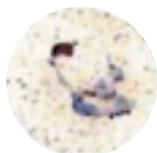




## THE PARASITE

The parasite that causes malaria is called **Plasmodium**. It may be seen only under a microscope. There are four Plasmodium species:

*Plasmodium vivax*



*Plasmodium falciparum*



*Plasmodium malariae*



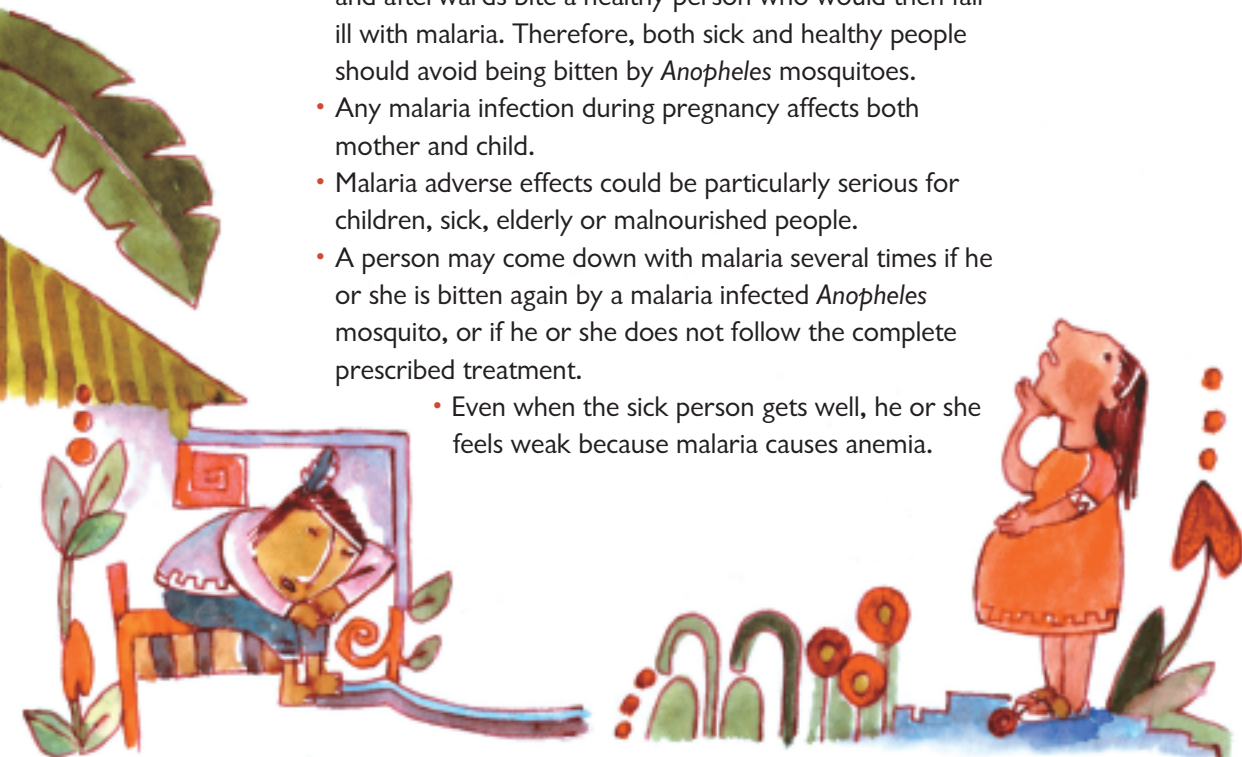
*Plasmodium ovale*



In this Handbook we will refer to the **Plasmodium vivax** and the **Plasmodium falciparum** since those are the species that most frequently cause malaria in Latin American and the Caribbean.

## THE DISEASE

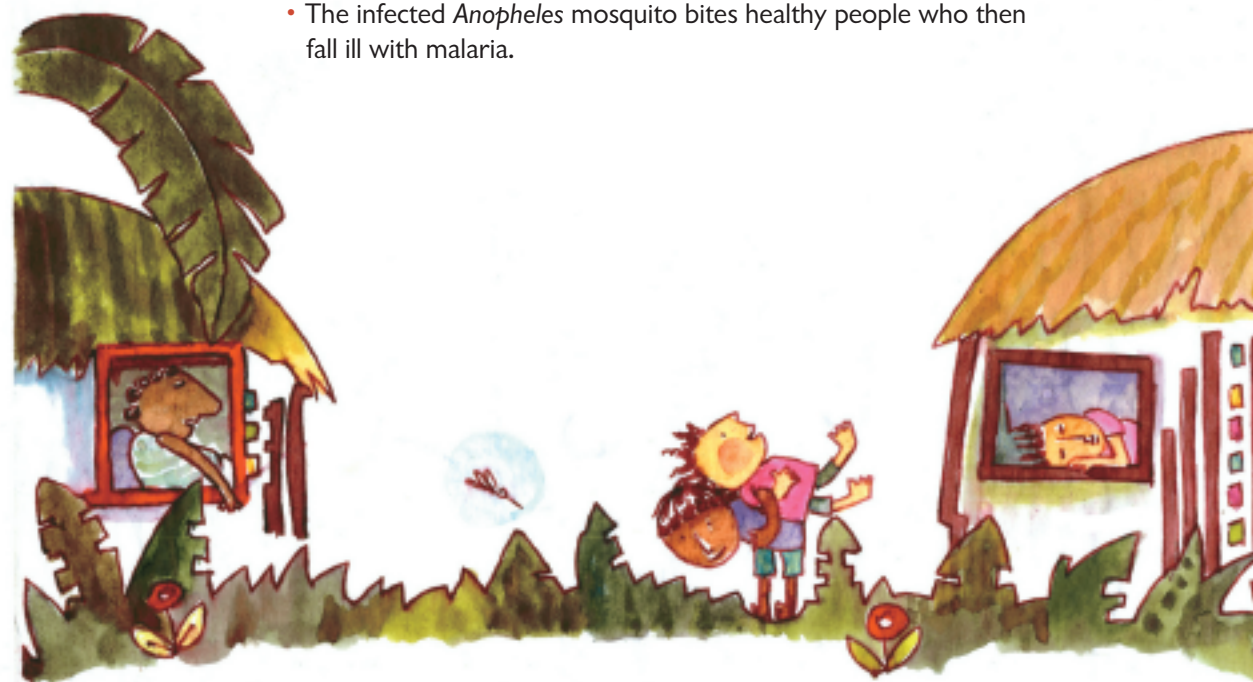
- Malaria is, in general, a serious disease that can be lethal, but which can be prevented.
- *Anopheles* mosquitoes can bite a malaria-infected person and afterwards bite a healthy person who would then fall ill with malaria. Therefore, both sick and healthy people should avoid being bitten by *Anopheles* mosquitoes.
- Any malaria infection during pregnancy affects both mother and child.
- Malaria adverse effects could be particularly serious for children, sick, elderly or malnourished people.
- A person may come down with malaria several times if he or she is bitten again by a malaria infected *Anopheles* mosquito, or if he or she does not follow the complete prescribed treatment.
  - Even when the sick person gets well, he or she feels weak because malaria causes anemia.



## MALARIA TRANSMISSION

Knowing how people get malaria will improve our ability to fight the disease.

- In communities where malaria exists, there are *Anopheles* mosquitoes and people with malaria.
- The *Anopheles* mosquito lives in breeding areas and is infected with malaria when it bites people who have malaria.
- The infected *Anopheles* mosquito bites healthy people who then fall ill with malaria.



## WHO CAN GET MALARIA?

Anyone bitten by malaria infected *Anopheles* mosquitoes.

### Particularly:

- People who live near *Anopheles* mosquitoes breeding areas.
- Men, women, children, adults and elderly people who live in neglected houses and nearby overgrown yards and stagnant waters and who are careless about their personal hygiene.
- Travelers or tradesmen who visit and sleep in places where malaria exists.
- Sugar cane harvest workers.
- Pregnant women or housewives who wash clothes in streams, ponds, creeks or wells.
- Children who go with their mothers to or play near wells with stagnant water, puddles, marshes or reservoirs.



## WHAT ARE COUNTRIES DOING TO FIGHT MALARIA?

In the Americas, countries work together on several initiatives and projects, such as:

- The Roll Back Malaria Initiative;
- The Regional Action Program and Demonstration of Sustainable Alternatives for Malaria Vector Control without using DDT in Mexico and Central America, a DDT/UNEP/GEF/PAHO Project.

### Countries are working together with the community to:

- Prevent malaria.
- Disseminate information about malaria.
- Identify promptly malaria cases.
- Provide timely and adequate treatment to malaria infected people.
- Encourage people to have timely blood tests.
- Encourage people to accept and follow a complete treatment.
- Eliminate mosquito breeding areas.
- Clean our homes, yards and neighborhoods.

### In order to do this, it is recommended that we should:

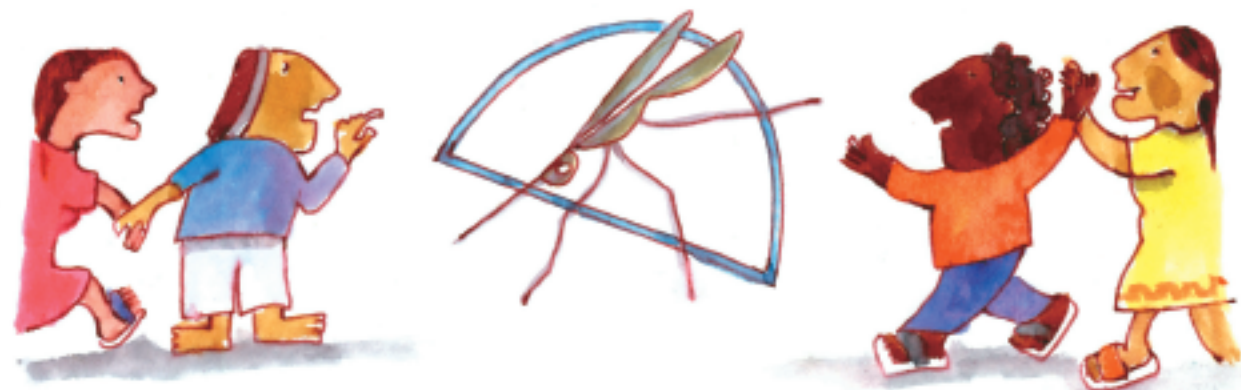
- Know the community very well.
- Keep in mind the community's lifestyles, knowledge and resources.
- Organize ourselves.
- Coordinate our actions.

- The **Regional Action Program and Demonstration of Sustainable Alternatives for Malaria Vector Control without using DDT in Mexico and Central America** is a project proposed by the United Nations Environmental Program (UNEP) and implemented by the governments of 8 Meso American countries (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama), together with PAHO/WHO. The program is financed by the Global Environment Facility (GEF) and participating countries, in cooperation with the North American Commission for Environmental Cooperation (CEC) and the Environment Cooperation for Development Commission (ECDC).

- The goal is to demonstrate that alternative methods for malaria vector control that do not use DDT, or other persistent pesticides, are replicable, sustainable and effective in preventing the introduction of DDT in the Subregion.

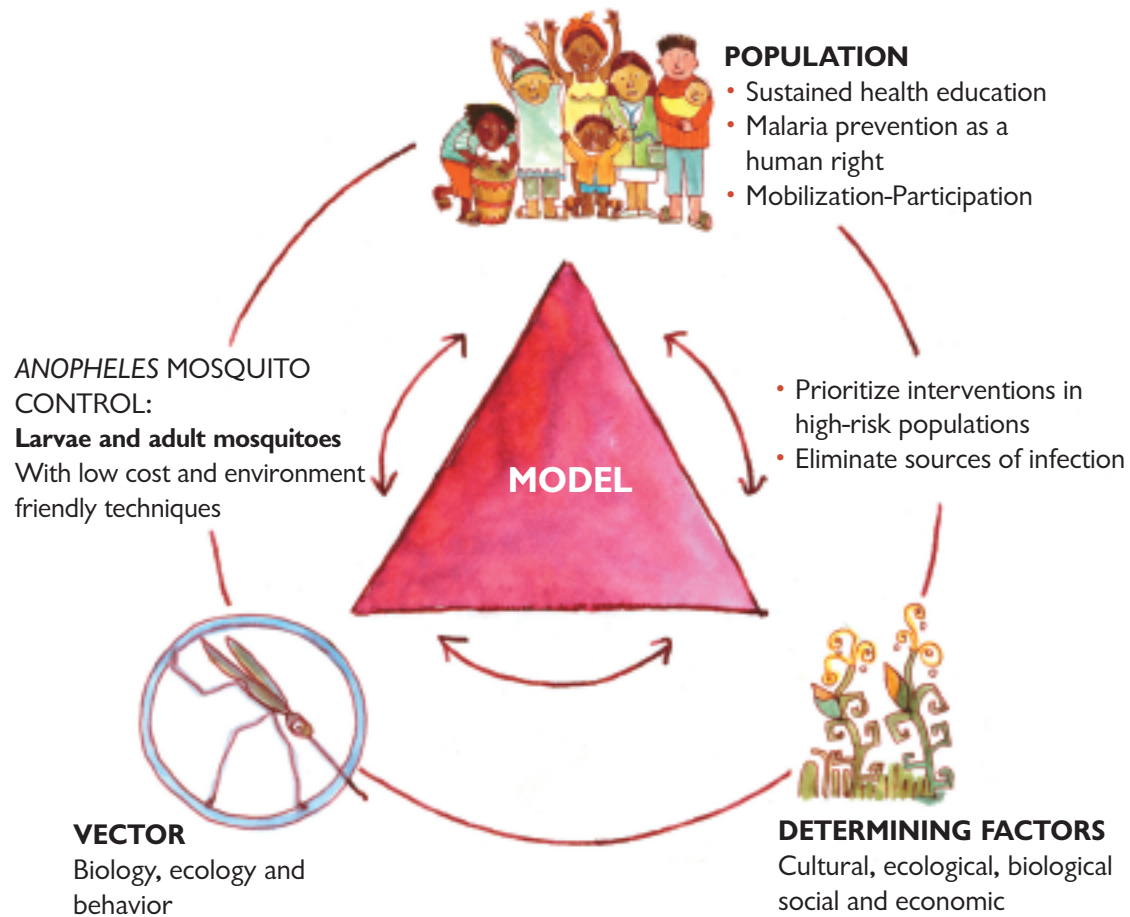
Demonstrative pilot projects are underway in each one of the participating countries with:

- Social empowerment.
- Active community participation.
- Community and institutional capacity-building
- Social justice and intercultural interaction as key components since over 80% of beneficiaries are indigenous community members.



## DDT/UNEP/GEF/PAHO PROJECT FOR DDT-FREE INTEGRATED MALARIA VECTOR CONTROL – A MODEL

Based on the experience gained in Mexico and enriched with contributions from participating countries and WHO **Roll Back Malaria** Initiative, the model incorporates different areas such as epidemiology, social sciences, entomology, health, education, environment and other disciplines.

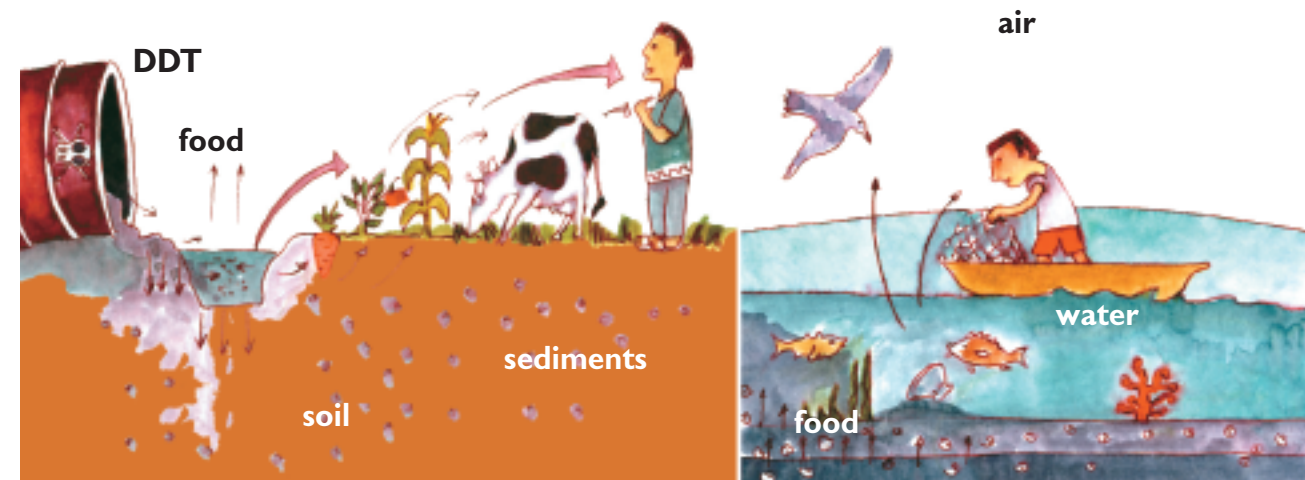


## WHY SHOULDN'T WE USE DDT?

Dichlorodiphenyltrichloroethane, known as DDT, and other persistent pesticides with adverse effects for human health, can remain in ecosystems for many years. For example:

- In the soil, for 20 to 30 years
- In sediments, for 6 to 20 years
- In water, for months.

## EXPOSURE TO DDT



## HOW CAN WE FIGHT MALARIA TOGETHER?

Communities usually have members who know how to use medicinal plants to prevent malaria and other diseases. Scientific research has been carried out on certain plants, like the cinchona or China bark tree, which are used in pharmaceutical drugs, such as quinine for malaria treatment. Other plants have not been studied yet but continue to be used in the community.

### Remember:

Malaria is a serious disease which, in some cases, can lead to death. To cure someone sick with malaria, natural medicine is not enough. Adequate treatment should be sought at a health center.

### In order to fight malaria, it is important to:

- Promote community knowledge.
- Combine traditional community knowledge with knowledge of the health staff.

### It is important to know that in communities where malaria exists, there will be:

- *Anopheles* mosquitoes
- Sick people with malaria
- Healthy people who could fall ill with malaria.

### Therefore ... we have to:

- Eliminate mosquitoes breeding areas.
- Clean houses and yards in order to eliminate places where *Anopheles* mosquitoes find refuge as well as dengue fever breeding areas.
- Protect ourselves from mosquito bites by using mosquito nets and long sleeved shirts or blouses.
- Provide prompt assistance to sick people with malaria.
- Cooperate within the community, with institutions working in the community and with the nearest health center so that the community is free from malaria and other diseases.



## LET'S IDENTIFY THE MOSQUITO

Mosquitoes that transmit malaria belong to the *Anopheles* family or genus. Females bite to get a blood meal.

There are several species of *Anopheles*. Each one of them has different habits:

<i>Anopheles</i> Species	Where does it live? Where are its breeding areas?	When do they bite?
<i>An. albimanus</i> (main vector in Central America)	Lake shores, marshes, ditches, water filled foot or hoof prints, etc.	It bites throughout the night, especially at sunset and sunrise; inside and outside houses.
<i>An. Pseudopunctipennis</i> ( <i>Seudopuntipennis</i> )	Lives in mountainous areas, river beds, and sun-exposed streams with filamentous algae.	It bites inside and outside houses at daybreak, sunset and nightfall.
<i>An. Darlingi</i>	In non-polluted fresh water, in shady places and lake shores.	Rests and bites inside houses, particularly between 12 pm and 2 am
<i>Anopheles vestitipennis</i>	Swampy areas well protected by vegetation.	Rests inside houses and bites outside houses between 8 pm and 2 am.

Mosquitoes live in breeding areas. These are found in stagnant waters, streams, ponds, creeks, wells, puddles, swamps or marshes and water reservoirs.

### Breeding areas may be:

**Natural permanent breeding areas:** Areas that do not dry out throughout the year and are found in river pools and streams.

**Temporary natural breeding areas:** Areas that dry out during certain periods of the year.

**Man-made permanent breeding areas:** Areas where water permanently accumulates in man-made works such as in reservoirs, dams, irrigation canals, field ridges, etc.

**Man-made temporary breeding areas:** Areas where water temporarily accumulates in man-made works.





## WHAT SHOULD WE DO TO CONTROL MOSQUITOES?

- **Clean up those places in the community where mosquitoes live.** There is no need to clean ALL places, just those which are close to houses or to gathering areas.
- In certain communities, people often join for (hands-on) community work (presta manos, mingas etc.) to:
  - Clean up the community
  - Whitewash and clean houses and courtyards.
- Several indigenous, Afro descendant and mestizo communities have plants such as nim that act as insect repellents.
- Biological or natural control can be used, such as bacteria that attack mosquitoes, certain types of mushrooms, or different worm species that feed on insects. The use of *Bacillus thuringiensis* var. *israeliensis* and *Bacillus sphaericus*, for example, does not have adverse effects on human or animal health or the environment. Another method is to use small fish that feed on mosquito larvae ("young" mosquitoes). They are known by different names: gambusia, chalacos, tulibo or joná as they are called in indigenous language of the Panamanian Ngöbe people.



## WHAT SHOULD WE DO TO PROTECT OURSELVES FROM MOSQUITOES?

We should be aware of mosquitoes biting hours ... and when we are most exposed to mosquito bites.

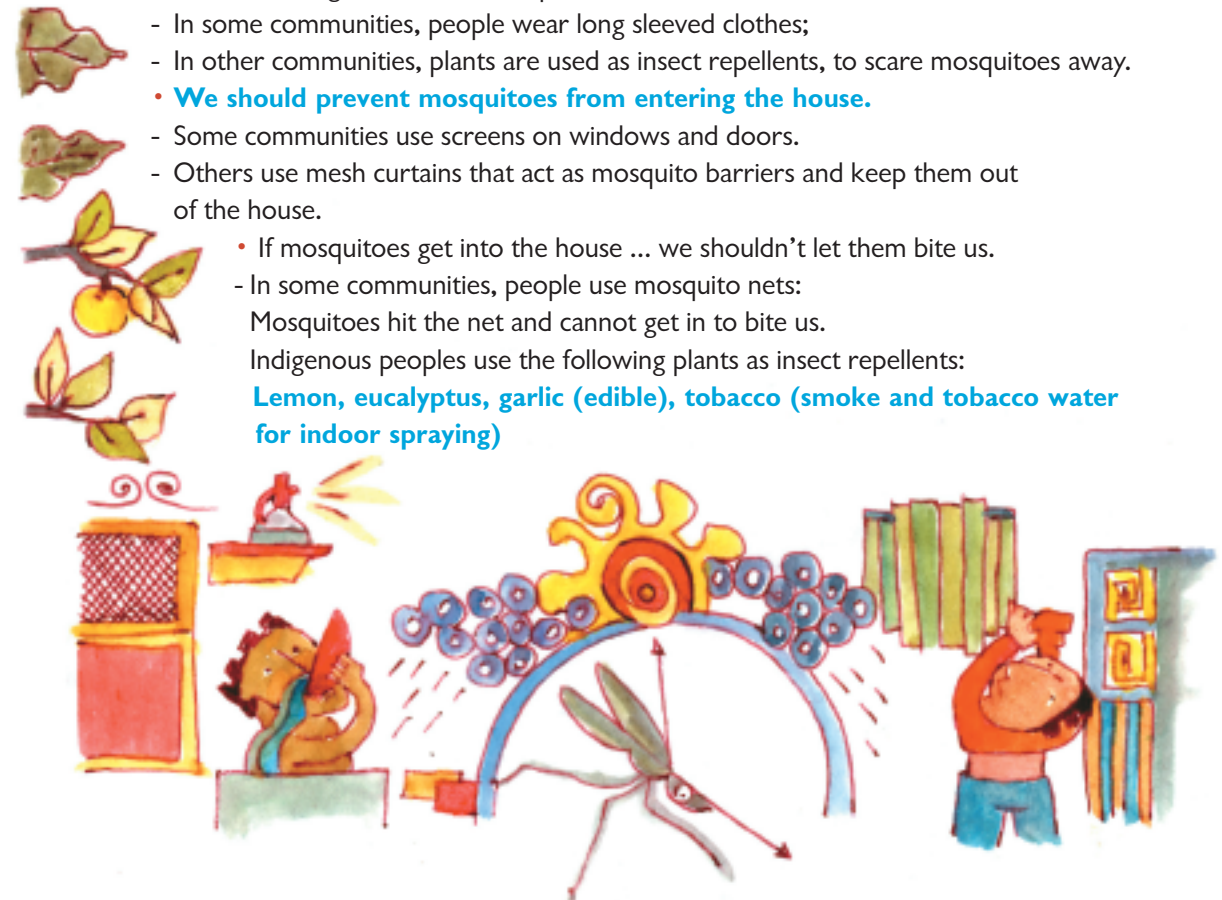
*Anopheles* mosquitoes bite at sunset and during the night. . .

### We are most exposed to mosquito bites when:

- We take a bath outdoors at sunset or at night. During the rainy season.
- There is increased migration. In areas where there is deforestation.
- We do not use adequate clothes and protection (long sleeved clothes and insect repellent), for instance, during activities such as:
  - Wood-cutting (all year round) – Palm hearts harvest (all year round)
  - Sugar cane, bananas, pineapples and other harvests (April-May) – Chestnut harvest (November-April)

### We can protect ourselves from mosquitoes in different ways:

- **We should remain indoors during the *Anopheles* mosquito biting hours.**
  - If we have to go out, we should protect ourselves:
    - In some communities, people wear long sleeved clothes;
    - In other communities, plants are used as insect repellents, to scare mosquitoes away.
  - **We should prevent mosquitoes from entering the house.**
    - Some communities use screens on windows and doors.
    - Others use mesh curtains that act as mosquito barriers and keep them out of the house.
  - If mosquitoes get into the house ... we shouldn't let them bite us.
    - In some communities, people use mosquito nets: Mosquitoes hit the net and cannot get in to bite us.
- Indigenous peoples use the following plants as insect repellents:  
**Lemon, eucalyptus, garlic (edible), tobacco (smoke and tobacco water for indoor spraying)**



## BEWARE!

A person might be thought to have malaria if he or she has fever, chills and sweats a lot. However, at the onset of the disease, malaria can be mistaken for other illnesses found in the community.



- For example, if someone tells us that he or she doesn't feel well, that they feel tired and have fever, we could think that they have the flu or "evil air".
- If someone else tells us that he or she has a headache, is vomiting and has diarrhoea, we could think that something he or she ate wasn't good enough and that he or she has indigestion.



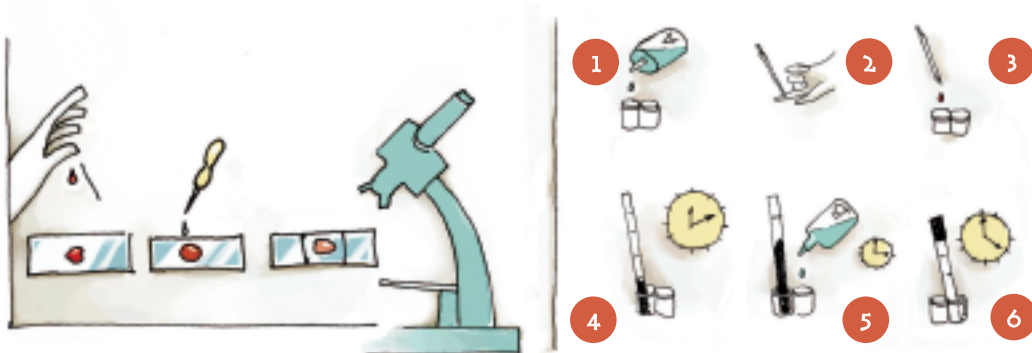
**However ... if malaria is an identified disease in my community or if the sick person has been to a place where malaria exists, I should think that these could be malaria symptoms.**

### How can we be sure that someone is sick with malaria?

Malaria parasites are found in a sick person's blood but cannot be identified with the naked eye, with normal lenses or with a magnifying glass.

We have a device called **microscope** to see them.

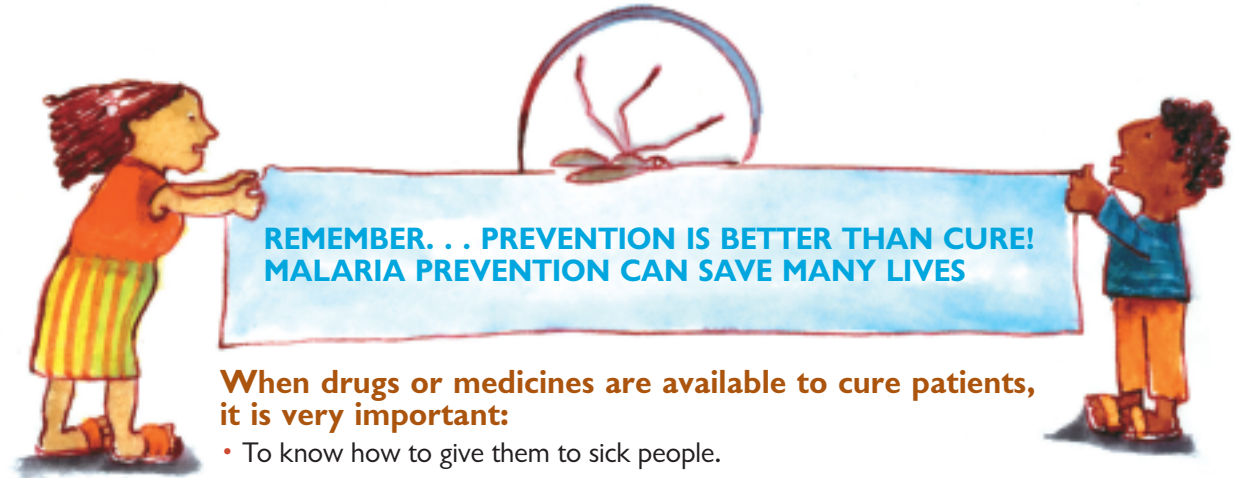
- In order to be sure that someone has malaria, we need to take a drop of blood, by pricking his or her finger. The blood is placed on a small glass plate, dyed with special substances and examined under the microscope. This is known as the **thick film test/ blood smear test**.
- There is another test that does not require a microscope and that can be done by whoever takes blood samples in the community. It is called the **rapid test**.



## ANTI MALARIA DRUGS AND MEDICINE

Many years ago, indigenous people would cure malaria with the bark of the cinchona or China bark tree (also known as cascarilla or cinchona tree).

Quinine has been used to treat and cure millions of people who had malaria. The active substance was isolated in 1820, and it comes from the same dry bark of the cinchona tree. Currently, indigenous peoples have traditional medicine practitioners, wise people and knowledge that have helped them fight malaria and other diseases.



**When drugs or medicines are available to cure patients, it is very important:**

- To know how to give them to sick people.
- To know if there are any problems or side effects that sick people and their families should be made aware of so that they will not worry if there are any uncomfortable effects. For example, stomach aches or vomiting.
- To know how to take care of sick people and what drugs and in what doses they should be given if malaria is caused by *Plasmodium vivax* or *Plasmodium falciparum*.
- To know if they are adults, children, or pregnant women (many drugs can harm the foetus).
- To explain to the sick person and his or her family that he or she will get well only if they follow the complete treatment.

If treatment is not completed, malaria becomes more resistant and is difficult to cure. If, despite treatment, a person's condition does not improve, he or she should go to the nearest health center or hospital before they get worse ...

**BUT... IF I THINK SOMEONE HAS MALARIA AND I HAVE THE DRUG TREATMENT, I MUST GIVE IT TO HIM OR HER AND DO MY OUTMOST TO CONVINCE THE PERSON TO GO TO THE NEAREST HEALTH CENTER OR HOSPITAL TO HAVE A BLOOD TEST.**

## TREATMENT

There are several treatment regimes depending on each country's national standards. The following treatment regimes have been taken from the Guidelines for the Implementation and Demonstration of Sustainable Alternatives for Malaria Integrated Control in Mexico and Central America, and adapted as per the World Health Organization's recommendations.

### Radical treatment of *Plasmodium vivax* over fourteen days

Age Group	Dosage of 150 mg Chloroquine tablets			Dosage of Primaquine tablets for 14 days	
	Day 1	Day 2	Day 3	5 mg	15 mg
Less than 6 months	1/2	1/4	1/4	Not recommended	-
6 – 11 months	1/2	1/2	1/2	1/2 (2.5 mg)	0
1-2 years	1	1	0.5	1/2 (2.5 mg)	
3-4 years	1	1	1	1 (5 mg)	0
5-7 years	1.5	1.5	1	1 (5 mg)	0
8-10 years	2.5	2.5	1	0	0.5 (7.5 mg)
11-13 years	3	3	2	0	1 (15 mg)
14 and older	4	3	3	0	1 (15 mg)

### Radical treatment of *Plasmodium falciparum* in Chloroquine-resistant areas

Age Group	Dosage of 150 mg. Chloroquine Tablets	Dosage of 5 mg Primaquine Tablets	Dosage of 15 mg Primaquine Tablets
Less than 6 months	1/4	0	0
6 months-1 year	1/2	1/2	0
2 – 5 years	1	1	0
6 – 12 years	2	2	0
13 years and older, weighing less than 60 kilos	3	0	2
13 years and older, weighing more than 60 kilos	4	0	3

### Treatment of *P. falciparum* with Sulfadoxine-pyrimethamine

Weight in Kg.	Age (years)	Dosis única Number of Tablets
5 a 10	2 -11 months	0.5
10.1 a 14	1 a 2 years	0.75
14.1 a 20	3 a 5 years	1
20.1 a 30	6 a 8 years	1.5
30.1 a 40	9 a 11 years	2
40.1 a 50	12 a 13 years	2.5
50 and over	14 years and older	3

### Treatment of *P. falciparum* with Mefloquine

Weight in Kg.	Age (years)	Number of Tablets (1st day)	Number of Tablets (1st day)
less than 5	Less than 3 months	Not recommended*	Not recommended*
5 a 6	3 months	0.25	0.25
7 a 8	4 a 7 months	0.5	0.25
9 a 12	8 a 23 months	0.75	0.5
13 a 16	2 a 3 years	1	0.5
17 a 24	4 a 7 years	1.5	1
25 a 35	8 a 10 years	2	1.5
36 a 50	11 a 13 years	3	2
51 a 59	14 a 15 years	3.5	2
60 and older	15 years or older	4	2

\*Not recommended due to limited data available concerning weight and age group.

### Artesunate doses (4mg/kg) for treatment of *P. falciparum* (in combination with Mefloquine or Sulfadoxine/Pyrimethamine)

Age (years)	No. of 200 mg. tablets (1st day)	No. of 200 mg. tablets (2nd day)	No. of 200 mg. tablets (3rd day)
Less than 11 months	1/4	1/4	1/4
1 a 2 years	1/2	1/2	1/2
3 a 6 years	1/2	1/2	1/2
7 a 11 years	1	1	1
12 a 14 years	1	1	1
15 years and older	1 y 1/4	1 y 1/4	1 y 1/4

Primaquine should not be taken by babies under six months of age, pregnant women and nursing mothers because of its adverse liver effects and its interaction with foetal hemoglobin.

### Treatment with a single massive dose (SMD)\*

Age Group	Number of 150 mg. Chloroquine Tablets	Number of 5 mg Primaquine Tablets	Number of 15 mg Primaquine Tablets
Less than 6 months	1/4	0	0
6 months to 1 year	1/2	1	0
2 a 5 years	1	2	0
6 a 12 years	2	4	0
13 years and older, weighing less than 60 kilos	3	0	2
13 years and older, weighing more than 60 kilos	4	0	3

\*This treatment regime has been adopted in Mexico by decision the national authorities.



## MALARIA IN CHILDREN

- If a child has fever (temperature) and if malaria exists in the community, it is possible that the child has malaria.

### MALARIA IN CHILDREN IS VERY DANGEROUS

- Children can die from malaria faster than adults, particularly if they have malaria falciparum. The child is thus in serious danger, and ... immediate action should be taken.

#### How do I know if a child is in danger?

A child can die when, besides fever, he or she has convulsions, vomits everything he or she eats, cannot nurse nor eat, has difficulty in breathing, bleeds spontaneously or is unconscious. Those are some of the danger signs.

**A child has fever when he or she has a temperature of 37.5°C (under the armpit) or a rectal temperature of 38°C.**



#### How do I know if a child with fever has malaria?

- **First, I must be sure that there are no danger signs. If there are any danger signs, I must do all I can to take him or her to a health center.**
- **If I am told that the child has had fever for more than 7 days, I should insist that he or she must be taken to the closest health center or hospital where a blood sample can be taken and adequate treatment provided to the child.**

#### If the child does not show any danger signs and I have drugs and medicines:

- I give the child medication to reduce the fever according to the country standards. If possible, I take a blood sample and give the child a first dose of anti malaria drugs.
- I explain which are the danger signs to the mother and ask her to come back if the child's condition worsens or if there are any danger signs.
- I visit the child the following day.

#### If the child does not show any danger signs and I do not have drugs and medicines:

- I shall do my best to convince the family that the child should be taken to the closest health center or hospital.
- I should go to the child's house to enquire about his or her health and talk about things we can do together to prevent the child or another family member from contracting malaria.

## MALARIA TREATMENT FOR CHILDREN

Each country has a treatment regime according to its national standards. Several treatment regimes tables are included in pages 44 to 47.

### WHEN CHILDREN HAVE FEVER

#### How can I tell if a child with fever does not have malaria or is danger of getting worse?

- **I must always be sure that the child:**
  - Shows no danger signs.
  - Has not been to places where there are *Anopheles* mosquitoes or sick people with malaria.
  - I should remember that when malaria starts it resembles other diseases. If I am told that the child has had fever for more than 7 days, I should have him or her taken to the nearest health center or hospital
- **If the child does not show any danger signs and I am sure that he or she does not have malaria:**
  - If I have medicines, I give the child medication to reduce the fever.
  - I explain which are the danger signs to the mother and ask her to come back if the child's condition worsens or if there are any danger signs.
  - I visit the child the following day.
  - I make good use of the child's visit to check if his or her skin is healthy, if he or she has the right weight and height for his or her age, to ask if he or she is eating well, if he or she has diarrhoea, if he or she has had all vaccinations due for his or her age, if his or her teeth are all right and to talk about the importance of taking good care of his or her teeth.

#### I talk to the family about things we can do together to prevent the child or another family member from contracting malaria.



## MALARIA PREVENTION DURING PREGNANCY

- We must explain to community members, and particularly to pregnant women, the dangers of malaria for them, their children, their families and their communities.

### Remember:

- When a pregnant woman gets sick with malaria, the disease affects both mother and child.
- Malaria causes anemia in the mother.
- Malaria can cause the mother's death.
- A malaria infected mother can have a miscarriage.
- The child of a mother with malaria can die at birth, have a low birthweight and be weak at birth. This will affect the child throughout his or her life.
- In many indigenous communities, pregnant women prefer to be assisted by traditional midwives. Most women prefer to give birth at home.

### Therefore, it is important:

- To talk with:** • pregnant women • traditional midwives  
• the family and the community • the staff at health centers.



## MALARIA TREATMENT DURING PREGNANCY

- When we give medicines to a pregnant woman, it is important to know which one of them, if any, could harm her baby.
- Each country has different treatment regimes for prevention and cure according to national standards.
- The World Health Organization recommends that **Primaquine should not be given to children under 6 months old, pregnant women or nursing mothers because of its adverse hepatic (liver) side effects and interaction with foetal hemoglobin.**

### Remember:

Any anti-malaria treatment (especially for children under six months old, pregnant women, nursing mothers, people with liver diseases and other serious health conditions) should always be followed and monitored by a health professional.



## ADDITIONAL CARE AFTER MALARIA TREATMENT

- **Malaria** parasites destroy blood cells. This explains why malaria causes **anemia**. People who have had malaria and have been cured remain weak. It is important to treat their anemia and recommend they eat certain food that will contribute to their recovery.
- Ferrous sulfate is used to treat anemia. Each country has different treatment regimes for adults, children, and pregnant women according to national standards.
- Indigenous and Afro descendant peoples use special plants and food to reinvigorate people who are weak after having suffered from malaria or other diseases. But these plants have not been studied yet.

## COLLECTIVE ACTION AGAINST MALARIA IN THE COMMUNITY

To be able to work together it is important to acknowledge both the strengths and the challenges faced by the community and the health center that provides services to it.

### What are the community's positive aspects and challenges?

- **Our peoples have several positive aspects, for example:**
  - We have our own organizations.
  - We have our own leaders and indigenous medicine practitioners.
  - When our leaders convene meetings, most community members participate.
  - Our knowledge comes from our ancestors from grandparents to children of their children. This knowledge is useful to cure our bodies and to feel fine where we live, to respect and care for nature and to live in peace with our ancestors and our spirits.



- **It is important to acknowledge, appreciate and develop these abilities to overcome some of the challenges faced by the community, for example:**

- Some community members do not attend training sessions.
- They do not participate in activities organized to clean up the community.
- Sometimes, people do not complete malaria treatment because, after taking the first few tablets, they feel fine and believe they have been cured. Others, because they do not have money to go to the health center to get treatment. This is extremely dangerous because if treatment is not completed, malaria can remain in your blood even if no symptoms appear.

MALARIA IS A REAL CHALLENGE. SO ARE OTHER DISEASES AND PROBLEMS SUCH AS POVERTY, LACK OF EDUCATION, LACK OF LAND, LACK OF JOBS AND OPPORTUNITIES FOR OUR PEOPLES.

## COLLECTIVE ACTION AGAINST MALARIA IN HEALTH CENTERS

### What are a health center positive aspects and challenges?

- **A health center has several positive aspects, for example:**
  - Health care is provided to sick people and educational talks are organized.
  - Health centers participate in vaccination campaigns.
  - Numerous patients have been cured thanks to services provided in a health center.
  - Several staff members at health centers belong to our communities and understand us.
- **It is important to acknowledge, appreciate and develop these abilities to overcome some of the challenges faced by health centers, for example:**
  - Health centers are closed at hours when we need care.
  - Some staff members at health centers mistreat community members or do not understand them.
  - Sometimes health centers lack the medicines we need and their staff comes to the community only during vaccination campaigns.



The community must select male and female leaders, health care workers and promoters who are committed to the community.

**As indigenous leaders and health care workers we must be committed to:**

- Receive on-going training
- Identify potentially ill persons.
- Educate people to have a blood test (lab test). If we have adequate equipment, to take a blood sample and, in less than three days, send it to be examined with a microscope for timely diagnosis.
- Support the person who has malaria and his or her family so that adequate treatment is completed.
- Organize health education and social mobilization actions, i.e. activities in which men, women, young people, adults and children from the community participate (recreational and environmental management activities).
- Eliminate *Anopheles* mosquitoes breeding sites.
- Provide guidance to families and communities through home visits and meetings.
- Organize exchange activities among traditional medicine practitioners.
- Update the community's diagnosis, census and map.
- Participate in all community-level activities of the Entomological Unit, for instance, to establish mosquitoes biting rates.
- Organize a situation room to discuss malaria control approaches and the community's health status.
- Make good use of community assemblies to achieve commitments to enhance the fight against malaria.

**Remember:**

- To value and rescue community knowledge.
- To encourage community participation.
- To combine community and health staff knowledge.



## COMMUNITY COMMITMENTS TO PREVENT AND CONTROL MALARIA

- Attend training sessions and put in practice the information received. For example, be aware of the *Anopheles* mosquito peak biting hours and use protection if you have to go out at this time.
- Keep houses and yards clean.
- Encourage personal hygiene and tell people to avoid keeping dirty or sweaty clothes inside their homes.
- Use mosquito nets, awnings or other similar nets.
- Drain stagnant water, fill in puddles.
- Contribute to community work to clean up the community and participate in community activities (fairs).
- Encourage whitewashing of house walls (painting walls with a water and caustic lime solution).
- Use biological control methods, such as *Bacillus thuringiensis* var. *israeliensis*, and *Bacillus sphaericus*, and small fish that eat larvae in mosquito breeding areas. In other words, methods that do not affect human health or the environment.
- Identify sick people in your family and community and look for immediate help.
- If they have malaria, make the commitment to take a blood test (thick film) and follow the complete treatment.



## HOW CAN I DO MY WORK WELL?

The community has elected me as a leader, community health care worker or promoter. In order to do my work well, I must therefore coordinate my actions with community leaders, indigenous medicine practitioners, other respected members of the community and community members in general.

### It is important that:

- The community or the health center provides me with a badge to identify myself as a leader or indigenous health worker.
- The community's great captain, major, chief, or president introduces me to community members at the community assembly so that they are all aware of my work.
- That I use the diagnosis, census, map and diagram of the community to identify risks and plan my work with the community in malaria prevention and control.

### Male and female leaders or indigenous health workers must:

- Try to use an integrated approach to address community needs.
- Coordinate their actions with the community, health services and other institutions working in the community (reference).
- Make good use of regular community assemblies and meetings to inform, educate and reach agreements with the community, municipal authorities and other institutions regarding the implementation of malaria prevention and control activities (community roundtables, community hands-on work, negotiating committees, etc.)

The health center staff should remember that indigenous community leaders and health workers are volunteers in most countries. In addition to their duties as leaders and indigenous health workers, they must work to support themselves and their families. Therefore, it is important to place their duties within their real context.

### Whom can we count on in our community work?

Joint work is important. Equally important is an organized community duly informed of its rights and duties.

### For our work, we can count on:

- Community leaders – Midwives
- Traditional medicine practitioners
- Teachers – Leaders
- National, regional and local indigenous organizations
- Community authorities (the community's great captain, major, chief, or president, or one of their delegates).

It is also important to coordinate your actions with local authorities, health services and other institutions that work in the community through indigenous organizations.



## HOW DO WE KNOW IF PROGRESS IS BEING ACHIEVED IN THE COMMUNITY?

In order to know if we are making progress in our work, we have to make a community diagnosis, in other words, we must know how the community is doing:

- What type of malaria exists in the community?
- How many people are in danger of getting sick?
- How many people are protecting themselves?
- How many people are sick?
- Where are the breeding and hiding sites of *Anopheles* mosquitoes?
- Which households have malaria cases year after year?

The following matrix and sample community map can help us in doing this:

### Community Diagnosis Matrix

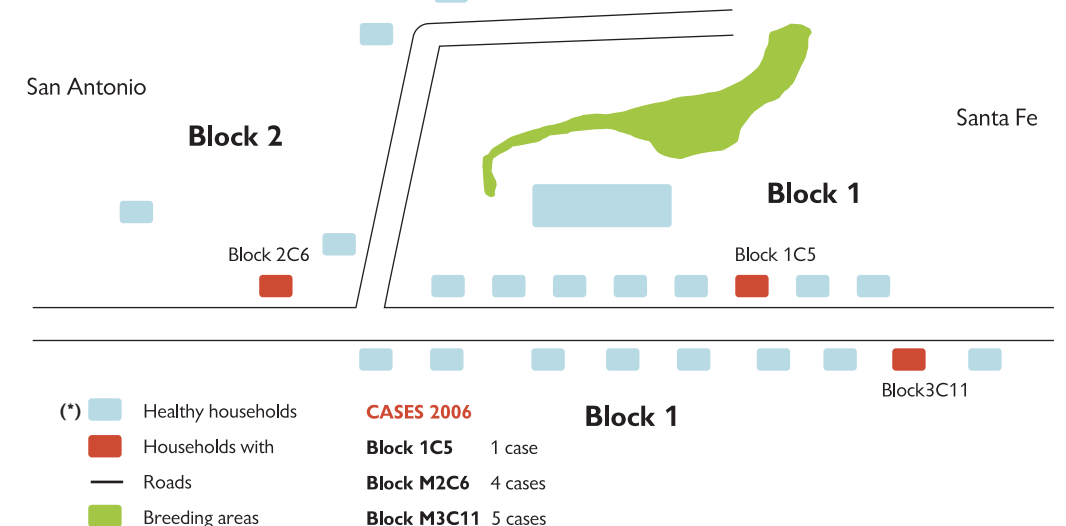
Persons				People	Age	Sick	Healthy	Remarks
M	F	P	C					

M = Male, F = Female, P = Pregnant; C = Child

This information should be shared with the community and with the health center. This information will be useful when planning our work.

### Sample community map: Sararia, Honduras

#### MAP OF SARARIA, 2006



(\*) Households with recurrent malaria cases, or with more than one case in the last 12 months.

## TO WHOM AND HOW DO WE REPORT ON OUR WORK AND PROGRESS?

We should report on our work and progress to the responsible person of the health area of our organization, to the community and to the closest health center.

### It is important:

- To present timely reports in order to inform of results, enable follow-up and decision-making.
- To fill-in complete matrixes to submit reports on our work.
- To review our reports to identify progress and problems in our work in order to improve it.
- To keep in mind that if we intervene in malaria infected households we will break the transmission cycle and we will be able to protect other families and the community as a whole.

### Matrix for Monthly Activities

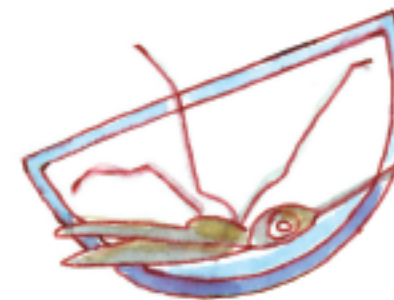
Community		
What did I do?	With whom?	Remarks

People											
Name	M	F	P	C	Age	Who got sick?	What did I do?	With whom?	Who got well?	Who died?	Remarks

M = Male, F = Female, P = Pregnant, C = Child



This information is useful to update the community census, diagnosis and map.



## OUR WORK IS VERY IMPORTANT!

Malaria is a serious disease. Though sometimes it can cause death, **it is a disease that can be prevented and controlled.**

Our work in preventing and controlling malaria is important and we have to do it together with the community and the health center.

### WE, THE LEADERS AND INDIGENOUS HEALTH WORKERS, ARE PART OF THE COMMUNITY AND OF THE HEALTH CARE TEAM.

**Together:** • the community • local governments • traditional authorities • health • education • agriculture • tourism, etc. • the staff from the closest health center • the staff of institutions working in the community, will help us to solve doubts and develop our knowledge and expertise to improve the assistance we provide to our communities.



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Regional Action Program and Demonstration of Sustainable Alternatives for Malaria Vector Control without using DDT in Mexico and Central America  
DDT/UNEP/GEF/PANIC PROJECT

**Health Surveillance and Disease Management Area**

Regional Malaria Program

**Technology and Health Services Delivery Area**

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