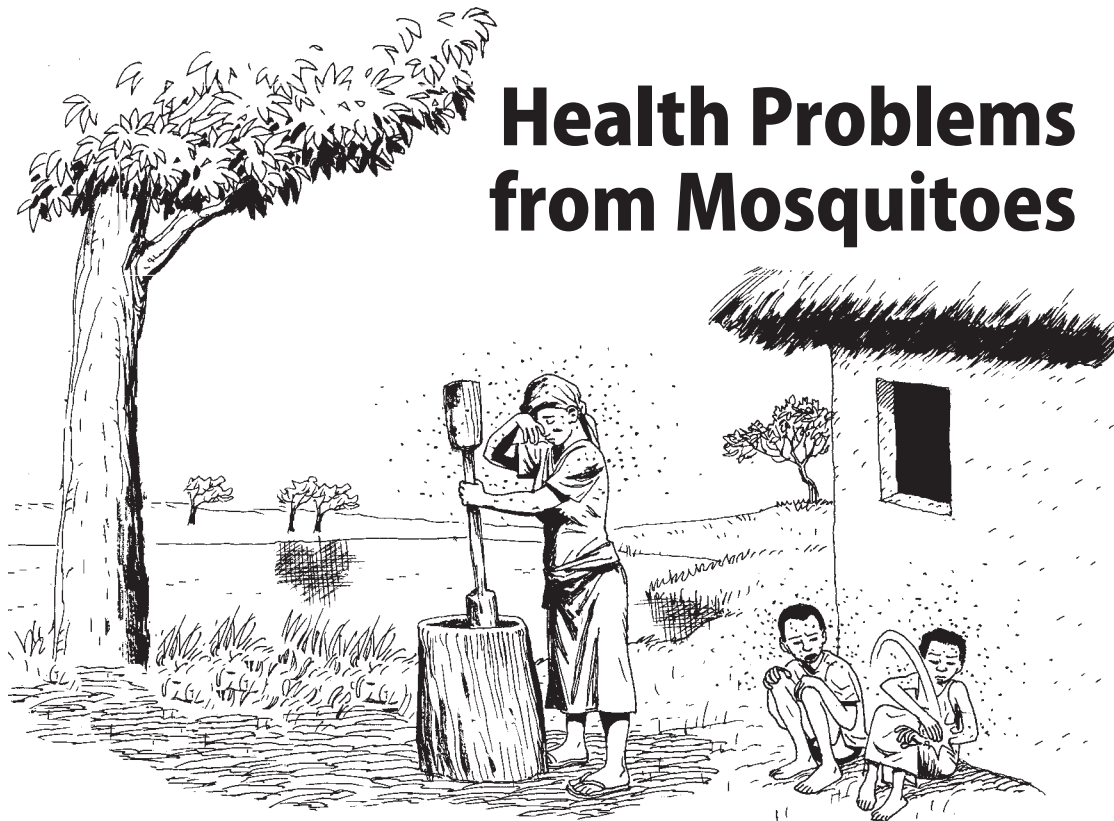


8 Health Problems from Mosquitoes

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Health Problems from Mosquitoes



Mosquitoes carry serious diseases such as malaria, dengue, and yellow fever. These diseases spread quickly from one person to the next. Mosquitoes breed in water that does not move (**stagnant water**), sometimes called “standing water.”

To prevent diseases spread by mosquitoes:

- **Reduce the risk of being bitten.** Use window screens, safe insect repellents, mosquito coils, clothes that cover as much of the body as possible, and insecticide-treated bednets.
- **Control the spread of disease with treatment.** Make sure that people get quick and effective treatment, regardless of their ability to pay.
- **Get rid of mosquito breeding sites.** Cover household and community water supplies such as water barrels and cisterns. Create good drainage for taps, wells, and water run-off channels.
- **Prevent new breeding sites** through careful land and water management.

Rapid changes in land use, such as cutting down too many trees, building dams and diverting rivers, or removing vegetation from large areas of land, all create conditions that allow mosquitoes to breed.

Illnesses carried by mosquitoes spread even more quickly during emergencies such as wars, large movements of people, and natural disasters, when people find it difficult to take ordinary preventive measures.

Malaria on the Trans-Amazon Highway

For many years, the government of Brazil worked with communities throughout the country to prevent and treat malaria. After years of work, there was no longer much malaria in Brazil. But over time, with changes in land use, and with less health care and health promotion, malaria began to come back.

In 1970, the government began to build a new road through the rainforest called the Trans-Amazon Highway. The government built houses and farms along the new highway and moved people from the poorest and most crowded parts of Brazil to live there. Cutting a road through the rainforest destroyed millions of trees and left a large area with no groundcover. Rainwater collected in ditches and pools, making places for mosquitoes to breed. Animals and birds that would normally eat the mosquitoes were killed or fled from the area the road passed through. And there were few clinics or health workers to care for the people building the road and moving into the new settlements.

Wherever the highway went, malaria followed. Many of the people who built the road caught malaria, and many died from it, as did the people who settled along the completed highway. The new settlers suffered greatly because the soil was not rich enough for farming and rains damaged the road, making travel difficult. Poverty and isolation made health problems worse. Once again, malaria became the number one killer in the entire country.



How Mosquitoes Cause Illness

Three serious illnesses carried by mosquitoes are malaria, dengue fever, and yellow fever. Each of these illnesses has different signs and is carried by a different kind of mosquito with different breeding habits. (For malaria see page 144, for dengue, see page 147, and for yellow fever see page 148.) But these diseases can be prevented in the same ways because they are all passed from mosquitoes to people.

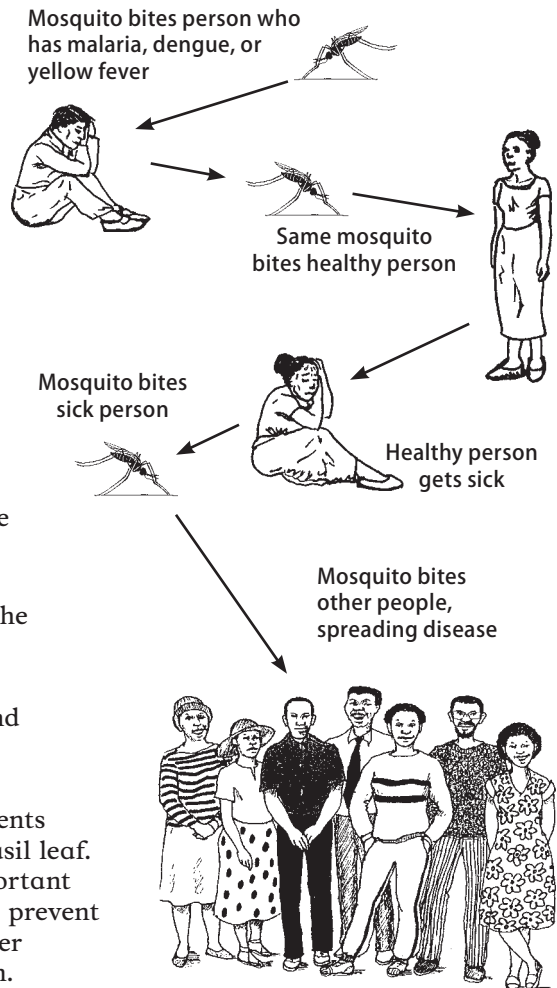
Prevent mosquito bites

All mosquito-borne illnesses can be prevented by preventing mosquito bites. To prevent mosquitoes from breeding, see page 149. To reduce the danger of being bitten:

- Wear clothes that completely cover the arms, legs, head, and neck (long sleeves, pants and skirts, and a head covering).
- Use mosquito coils and repellents like citronella, neem oil, or basil leaf. Repellents are especially important for children because they can prevent mosquito bites even when other preventive steps are not taken.
- Use screens on windows and doors.
- Use mosquito netting and bednets treated with insecticide to prevent bites while you or your children sleep. Tuck the edges of the nets under the bed or sleeping mat so there are no openings. In many places, pregnancy care programs offer bednets at low cost or no cost to women and young children. To be effective, bednets must be re-treated every 6 to 12 months. Also use a net when sleeping outdoors.

Note: Bednets are most effective for malaria, and less effective for dengue and yellow fever. See page 146.

How mosquito-borne diseases spread



Malaria



Malaria is an infection of the blood that causes high fever and chills.

It is caused by a parasite (called plasmodium) that is passed to people by a certain kind of mosquito that bites mostly at night.

Millions of people die from malaria every year, and many millions more live with the disease.

Malaria is especially dangerous to children under 5 years old, pregnant women, and people with HIV. Pregnancy lowers a woman's ability to fight illness and infection. If she becomes ill with malaria, she may also get severe anemia (weak blood) which increases the chance of death during or after giving birth. Malaria in pregnancy can also cause her to lose the baby (miscarriage) or cause the baby to be born too soon, too small, or dead (stillbirth).

There are many kinds of malaria. People can live for many years with some kinds of malaria, and most kinds of malaria can be cured. But cerebral malaria (*Plasmodium falciparum* or *P. falciparum*) can cause death within 1 or 2 days of being infected. In areas where cerebral malaria exists, it is especially important to seek testing and treatment right away if you suspect you have malaria.

Usually malaria causes fevers every 2 or 3 days, but in the beginning it may cause fever every day. Anyone who suffers from unexplained fevers should have a blood test for malaria. This can be done at most health centers. **If the blood test is positive for malaria, or if testing is not available, get treatment right away.**

Malaria Song (from Mozambique)

If your child has a fever
And doesn't have diarrhea
And doesn't have a cough
It is **malaria**
Take your child to the hospital
Start medicine the first day
Continue for 2 more days



When he gets better
Give him extra food 3 times each day
Do this for 2 weeks
So he will live for
many more years

Signs

A malaria attack has 3 stages:

1. The first signs are chills and often headache. The person shivers for 15 minutes to 1 hour.
2. Chills are followed by high fever. The person is weak and at times not in his right mind (**delirious**). The fever may last hours or days.
3. Finally the person begins to sweat and the fever goes down. After the fever drops, the person feels weak.

Treatment

If possible, get a blood test. Start treatment as soon as the first signs show. Because malaria is passed from person to person by mosquitoes, treating a sick person also protects others from getting infected. After you have been treated, mosquitoes that bite you will not pass malaria on to others.

Find out what medicines for malaria your local health authorities recommend.

In many regions, the malaria parasite has developed **drug resistance**. This means that medicines that once worked to prevent or treat malaria are no longer effective. Medicines that cure malaria in one region may not cure the malaria found in a different place.

There are new medicines or combinations of medicines now being given to treat malaria in different regions. One of these, artemisinin (used for many years in China), is often taken with another antimalaria medicine or with an antibiotic. In some areas, chloroquine (the most common medicine for many years) still works. The only way to know what medicine will work in your area is to check with your local health authorities.



The woman who took all of her medicine got better.

IMPORTANT: Take all of the medicine for all of the days recommended, even if you feel better. If you stop taking the medicine the malaria may come back and the medicines may no longer work.



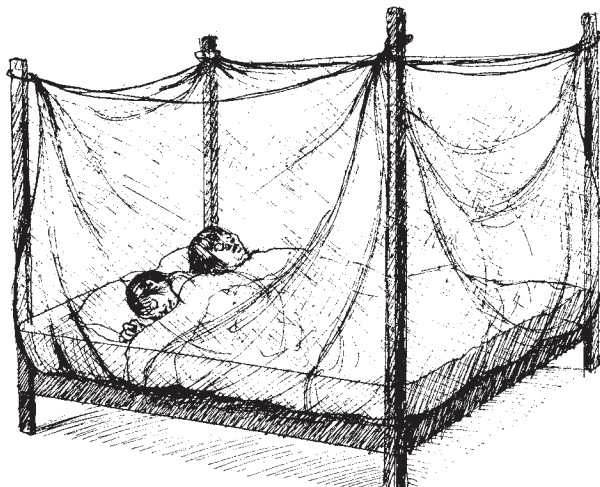
The woman who did not finish all her medicine is still sick in bed.

Prevention

Malaria occurs most often during hot, rainy seasons because the mosquitoes that carry it breed in warm, stagnant water. But in some areas of the world, malaria is also found in the dry season, when mosquitoes find breeding sites in small standing pools of water. As with dengue and yellow fever, the best way to prevent malaria is to avoid mosquito bites (see page 143) and to use community mosquito control (see pages 149 to 153).

Sleeping under an insecticide-treated bednet is a good way to prevent and control malaria. These bednets are treated with an insecticide called “pyrethrins,” which is relatively safe, especially compared to getting malaria. The greatest dangers from insecticide-treated bednets are when they are dipped in the insecticide (leading to exposure through the skin), when children suck or chew on them (leading to exposure through swallowing), and when they are washed (because the insecticide can poison water sources and harm fish, insects, animals, and people downstream).

Bednets only protect if any holes or tears are quickly repaired. Also, the insecticide on the bednet wears off after 6 to 12 months, or sooner if it is often washed. In some places, you can now get “long-lasting” treated mosquito nets that work for over a year. If the bednet is still in good condition, new pesticide can be mixed and applied, but if the bednet has many rips or tears it may be safer to replace it. When reapplying pesticide, wear gloves and pay careful attention to the directions.



Malaria mosquitoes bite at night. To prevent malaria, sleep under an insecticide-treated bednet.

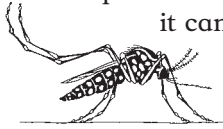
Treatment for all

Malaria is most common among poor people, and the number of deaths is growing each year. When people cannot afford blood tests and medicines and do not have access to health services, they are forced to live and die with this disease. And as long as one person has malaria, the infection can spread to others.

Malaria occurs most often in communities suffering from poverty and social injustice. For prevention campaigns to be successful, they must address the root causes of poverty and injustice as well as making treatment available for all.

Dengue Fever (Breakbone Fever)

Dengue fever is caused by a virus spread by a black mosquito with bands of white dots that look like white stripes from a distance. Their legs are also striped. This mosquito is sometimes called the “yellow fever mosquito” because it can also carry yellow fever (see page 148). Dengue usually occurs during the hot, rainy season. It is most common in cities, in places where water collects, and where there is poor drainage.



The first time a person gets dengue, she can usually recover with rest and lots of liquids. But when a person gets it a second time or any time after that, it can be much more dangerous and may even cause death.

Signs

When first sick, a person gets a sudden high fever with chills, severe body aches (dengue is sometimes called “bone-break” or “breakbone” fever), a headache, and sore throat. The person feels very ill and weak. After 3 to 4 days, the person usually feels better for a few hours to 2 days. Then illness returns for 1 or 2 more days, often with a rash that begins on the hands and feet. The rash spreads to the arms, legs, and body (but usually not the face).

Babies, young children, and older people, or people with weak immune systems (such as people with HIV), are especially at risk for a more severe form of dengue called hemorrhagic dengue. If not treated right away, this form of dengue causes bleeding from the skin and can lead to death.

Treatment

There is no medicine to treat dengue, and no vaccine to prevent it. In most cases, dengue can be treated at home with bed rest, drinking plenty of fluids, and taking **ibuprofen** or **paracetamol** (not aspirin) to reduce pain and fever.

IMPORTANT: Hemorrhagic dengue can only be treated by quickly replacing body fluids and blood. Go to a hospital immediately if the person starts to bleed from the skin, is unable to eat or drink, or acts confused (a result of fever, weakness, and the inability to stay awake). It is also important to get help right away if the sick person is a baby, young child, an elder, or has some other serious health problem, such as diabetes, heart disease, or HIV.

Prevention

The mosquito that spreads dengue breeds in clean standing water. Unlike the malaria mosquito, the dengue mosquito bites mostly during the day. For this reason, bed nets have little effect except for small children or older people who sleep during the day. Dengue mosquitoes usually stay in shady, dark places, such as under tables or beds, or in dark corners.

To prevent dengue, avoid mosquito bites (see page 143) and practice community mosquito control (see pages 149 to 153).



Yellow Fever

Yellow fever is carried by mosquitoes in Africa and some parts of South America. There are two kinds of yellow fever and they spread in different ways:



Jungle yellow fever is spread from infected mosquitoes to monkeys, and back again from monkeys to mosquitoes. People get infected when they are bitten by mosquitoes that have been infected by monkeys. Jungle yellow fever is rare and mostly affects people who work in tropical rain forests.

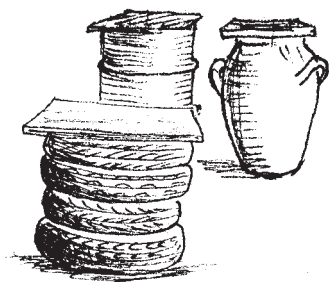
Urban yellow fever is the cause of most yellow fever outbreaks and epidemics. Like malaria and dengue, urban yellow fever spreads when a mosquito bites and sucks the blood of an infected person, and then passes the infection to the next person it bites.

Urban yellow fever is spread by the same black mosquito that spreads dengue. It has white dots along its back and legs. These mosquitoes live and breed in standing water in cities, towns, and villages.

Signs

Yellow fever causes fever, chills, muscle pain (especially backache), headache, loss of appetite, nausea and vomiting, high fever and slow pulse. For most people, the illness goes away after 3 or 4 days.

But for some people, about 1 out of every 7, the fever returns 24 hours after the first signs go away. **Jaundice**, abdominal pain, and vomiting may be followed by bleeding from the mouth, nose, eyes, and stomach. Death may occur within 10 to 14 days, but half of the people sick with this second round of yellow fever survive with no serious damage to their health.



To help prevent yellow fever, get rid of places where mosquitoes can breed and keep water containers covered.

Treatment

The best treatment for yellow fever is bed rest and drinking plenty of fluids. Most people recover completely over time and develop a resistance to it. A small number of people do get the disease again, before they have recovered from getting it the first time. But they too usually recover.

Prevention

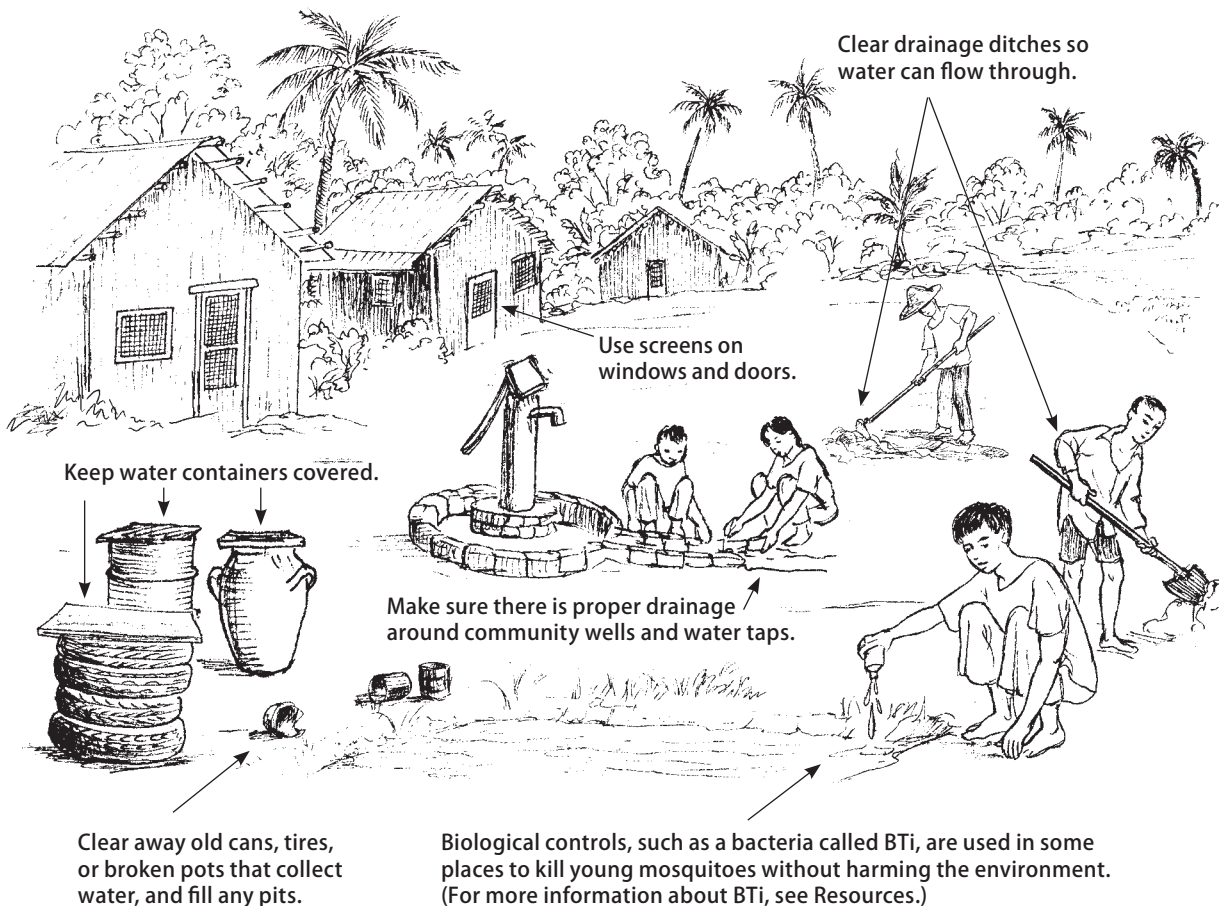
Like malaria and dengue, the best way to prevent yellow fever is to avoid mosquito bites (see page 143) and control mosquitoes (see pages 149 to 153). Vaccination is the only sure prevention for yellow fever, but may not be available or may be expensive.

Community Mosquito Control

Mosquitoes lay eggs in standing water. It takes about 7 days for mosquito eggs to hatch. By getting rid of standing water once a week, or by making water move and flow, mosquito breeding is interrupted and they do not live to spread diseases. To prevent mosquitoes from breeding:

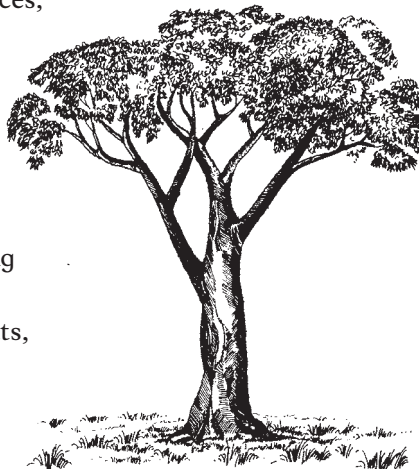
- Get rid of places where water collects (standing water) such as old car tires, flower pots, oil drums, ditches, uncovered water storage containers, and any standing water inside the house.
- Manage land in ways that prevent water from collecting so the water will instead soak into the ground.
- Make sure watersheds are protected so that water will keep flowing (see Chapter 9).

Remove mosquito breeding sites around the house and community:



Other methods used in community mosquito control programs include:

- **Breeding fish that eat mosquitoes.** The Central American mosquito fish, South American guppies, African tilapia, carp, and other fish can be used to control mosquitoes. These fish have different common names in different places, but are often called “mosquito fish.”
- **Make sure water flows and fields drain** by restoring natural waterways, making drainage channels to let water move, and filling in unused irrigation trenches and ponds. Drain rice paddies once a week for 2 or 3 days to kill young mosquitoes without harming rice production.
- **Plant trees** to provide homes for birds, bats, and other natural helpers in mosquito control. Neem trees from Africa and India keep mosquitoes away and the leaves can be used as medicine.



Using insecticides

Where mosquitoes breed only part of the year, they can be quickly destroyed with insecticides. In the past, the pesticide DDT was widely used to kill malaria mosquitoes, and was sprayed outdoors over mosquito breeding sites. But DDT is a poison that does great harm to people and animals, causing cancer and birth defects (see Chapter 16). DDT can travel great distances in the air and in water, and stays in the environment for many years, becoming more dangerous over time. Because of this, community prevention activities and less toxic insecticides are now recommended in most countries.

One type of insecticide, called pyrethrins, causes less long-term harm to people, animals, and the land. Another advantage of pyrethrins over DDT or malathion (another common but harmful pesticide) is that much less is needed to spray the same amount of space.

Pyrethrins do not collect in the environment. But they are toxic when people are exposed to them, and must be used with care. Pyrethrins irritate the skin and eyes, and cause rashes and difficulty breathing. Avoid direct contact with this insecticide, especially children and women who are pregnant or breastfeeding. Pyrethrins are very toxic if they get into water sources.

Never use pyrethrin products near waterways or ponds.

Recently, DDT has come back into use in different ways than before. It is now recommended only for limited use indoors, in a method called Indoor Residual Spraying (IRS). This is spraying small amounts of DDT on the inside walls of a house to kill mosquitoes that land there. This method uses less poison in a smaller area, prevents it from entering water sources, and has less chance of causing mosquitoes to become resistant.

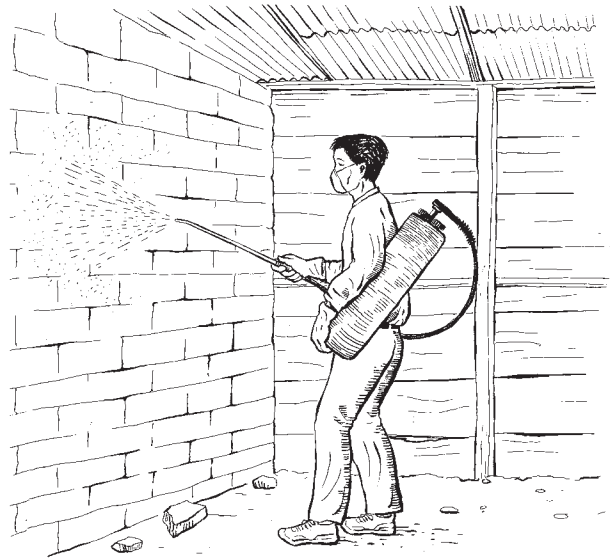
All insecticides are poisons.

When using DDT, pyrethrins, or any other insecticide:

- Follow directions and spray with caution.
- Always wear protective equipment when spraying (see Appendix A).
- Use as little of the chemical as possible. Spray only where mosquitoes enter the home, and where they live or rest.
- Never spray near children or women who are pregnant or breastfeeding.
- Make sure children do not suck or chew on insecticide-treated bednets, and that they touch the net as little as possible.
- When washing insecticide-treated bednets, use a basin and pour the wash water into a soakaway pit (see page 82) to protect waterways and drinking water sources.

Overuse of any insecticide can cause mosquitoes to become resistant to it and the insecticide will no longer harm them. (To learn more about the dangers of insecticides and how to use them as safely as possible, see Chapter 14.)

Spraying insecticides is an emergency measure for quick mosquito control. But insecticides will only reduce mosquito-borne illnesses if they are used as part of a program that includes treatment for everyone, communitywide control of mosquito breeding, and community education.



Insecticides are a short-term mosquito control measure. If you must use them, wear safety equipment.

Stopping dengue by stopping mosquitoes

Over the past 25 years, people in Managua, Nicaragua have been increasingly getting sick with dengue fever. Because the mosquito that spreads dengue lives in water in and around homes, dengue spreads widely when more people move into tropical cities without safe water storage and wastewater drainage.

People in Managua worked with scientists, NGOs, and the Ministry of Health to reduce and prevent dengue in 10 neighborhoods. The first thing they did was to collect ‘evidence’ of the spread of dengue. Children collected samples of water with mosquitoes in different stages of growth, scientists tested children’s saliva to see how many had been bitten by dengue-infected mosquitoes, and community members visited people’s homes to ask them what they knew and thought about dengue.

They used neighborhood meetings, posters, and **sociodramas** to share what they learned about dengue. Children played games where they smashed hollow dengue mosquito puppets, scattering the candy hidden inside. Young people, including gang members, wrote and performed popular-style songs about preventing dengue.

Each neighborhood developed its own mosquito control program. Because they knew that mosquitoes breed in discarded tires, one group decided to collect old tires, fill them with soil, and use them to make stairways up steep paths. That got rid of mosquito breeding sites and made it easier to get up and down the hillside. Other tires were used as planters.



A group in another neighborhood made and sold low-cost lids for water storage barrels. This got rid of mosquito breeding sites while also earning money for their community.

The community dengue prevention program continues today. Not only are fewer people getting sick with dengue, but the program has brought other benefits:

- Young people, including gang members, were involved in making positive changes in their neighborhoods, which increased the community's togetherness.
- Musicians wrote popular songs to educate people, making dengue prevention fun.
- Different religious and political groups put aside their differences to work together on a common project.
- Local health activists were asked to serve on Ministry of Health governing boards for health posts and centers.



Now, people from these 10 neighborhoods are helping other communities get organized to stop dengue and improve community life.