



MALARIA

A disease of the developing world

Introduction

Malaria is an **infectious disease** and is found mainly in the world's poorest **tropical areas**, such as Africa, South America and South East Asia.

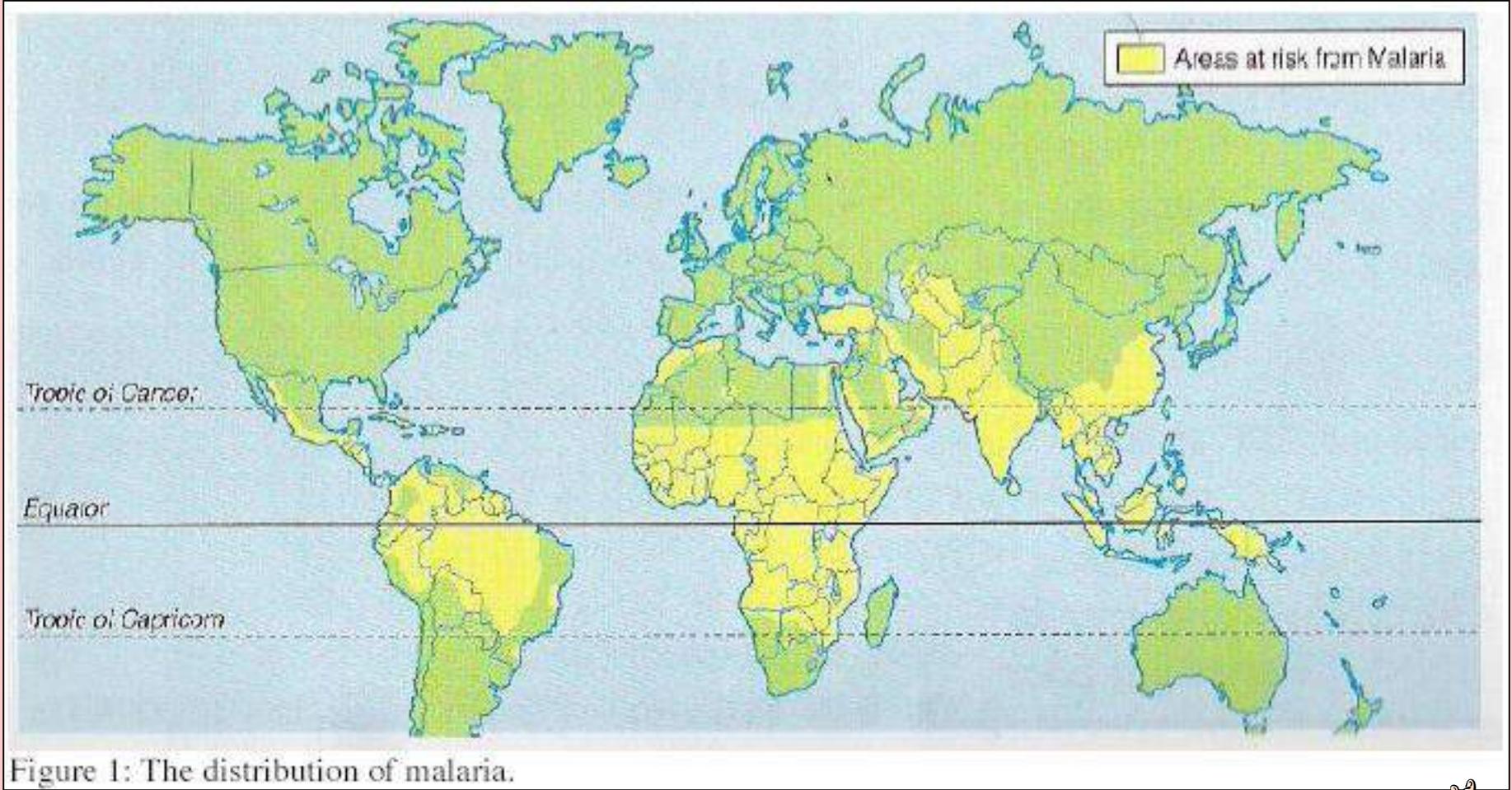
The disease **affects 400 million people** and kills two million every year, half of them being children.

90% of all cases occur in Africa.





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Cause and method of transmission

- Malaria is caused by a tiny **parasite** in a person's bloodstream.
- The parasite enters a person's bloodstream when they are bitten by a carrier mosquito.
- Not all mosquitoes carry the disease. Only the female anopheles mosquito spreads malaria.
- It bites an infected person and sucks blood containing the parasite into its stomach.
- The parasite then multiplies in the mosquito's stomach.
- The mosquito then bites someone else and the parasite enters the new victim on the saliva of the mosquito.
- The mosquito is unaffected by the parasite.





Physical and Human factors

There are **physical factors** that determine where malaria occurs:

physical

- The mosquitoes live in very warm or hot areas, with **day-time temperatures above 16°C all year round.**
- They need **still (stagnant) water surfaces** as breeding areas, but these areas do not need to be large.



As a result, all warm, rainy areas with still or slow-moving water are suitable environments for the anopheles mosquito.





Human factors (people's activities) also affect the distribution of malaria.

human

- Where people have created **padi fields**, built **dams** and **made irrigation** channels, they have created suitable breeding grounds for the mosquito and so malaria increases.
- People **migrate** much more now and this makes it easier for the disease to spread.
- People living in crowded conditions do this as well.





Symptoms and consequences of malaria

Malaria is a horrendous disease. The symptoms are as follows:

- After a few days, the infected person suffers **headaches and stomach pains**
- This is then followed by fevers of high temperature and shivering fits. The fevers can occur many times, frequently resulting in the death of the victim.
- If malaria does not kill the victim, it can cause **kidney failure**.
- It leaves the patient weak and anaemic and **prone to other diseases**.
- The person's **life expectancy is reduced** considerably.

Malaria is a particularly big killer of children, who have not had time to build up immunity from the disease.





Areas that have malaria also **suffer economically**.
In areas where malaria occurs, many people will have the disease.

As a result, the amount of wealth (from farms and factories) that the area produces is seriously reduced because **many people are too sick to work**.

At the same time a lot of time and money has to be spent on caring for all the victims.

EXAMPLE:-In the Philippines in SE Asia, when malaria was rife in the 1940s, 35% of the working population was absent from work because of the disease.





Controlling malaria

At present there are a number of ways in which the disease is attacked.

However, no one solution has been found that is totally effective.

Most control methods have their difficulties:





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solution

Spray insecticides (e.g. DDT, dieldrin) on breeding grounds in and around houses

-chemicals pollute the environment, killing other life forms.

-they are expensive.

- mosquitoes are becoming resistant to them.

problems





solution

Drain breeding grounds.

-very expensive

-requires large inputs of manpower

-impossible to do thoroughly, as only small areas of water are needed, e.g. potholes in roads, empty coke cans, bomb craters in war zones.

- water is also need for drinking, cooking, washing, for growing crops and watering animals.

problems





solution

Destruction of larvae by spraying oil onto the water surface.

-the film of oil suffocates the larvae, however, it is expensive and wasteful.

problems

- it pollutes water sources and kills wildlife.





solution

Mustard seed 'bombing'.

This is when mustard seeds are thrown into the breeding grounds. The seeds become wet and sticky in water and drag the mosquito larvae below the surface and drown them.

problems

- difficult to do thoroughly over large areas
- wasteful





solution

Egg-white sprayed on stagnant water surfaces.

This suffocates the larvae by clogging up their breathing tubes.

-wasteful and impractical (what happens to all those egg yolks!)

- difficult to do thoroughly over large areas

problems





solution

Larvae-eating fish.

The small fish eat mosquito larvae and they provide an added source of protein in the people's diet.

- People are hungry and eat the fish too quickly for them to reproduce and eat all the larvae.

problem





Bti bacteria grown in coconuts.

Fermented coconuts are, after a few days, broken open and thrown into mosquito-infested water. Larvae eat the bacteria and have their stomach linings destroyed and die!

- cheap to produce
- environmentally friendly bacteria which is harmless to livestock and humans
- coconuts are plentiful and often grow beside ponds infested with mosquito larvae
- 2 to 3 coconuts will 'control' a small pond for up to 45 days
- People are hungry and eat the coconuts





solution

Planting Eucalyptus trees.

These trees are good at soaking up excess moisture in the soil. It is believed this will help to reduce breeding sites.

- The trees are not native to many areas and do not grow well.
- Trees are chopped back to provide firewood and die.

problems





solution

Letting water out of dams.

The life cycle of the mosquito requires ten days in stagnant water in the larval stage. Flushing the river below a dam before the ten days are up kills larvae and reduces the adult mosquito population.

problem

-Water is precious and it is not economic to flush some away.

- Villages downstream find sudden rises and falls in river levels unsettling and at times dangerous.





solution

Genetic engineering.

Scientists have 'doctored' male mosquitoes to make them sterile in a few generations.

These male mosquitoes are then released into the wild and spread the gene. Eventually their offspring are unable to mate with the female mosquito to produce offspring.

- extremely expensive to do
- public concern about such research

problems





Drugs.

Malaria can be treated using drugs, such as **larium**, **chloroquine** and **malarone**. These, injected into people, kill the parasite in humans and break the cycle. Research into other successful drug treatment is on-going.



-most are becoming ineffective because the parasites have built up resistance to them.

problems

-Drugs can have harmful side effects, including personality changes and mood swings

- It is much cheaper to prevent the disease rather than cure it.





solution

Education.

Local health campaigns may be very successful, especially **primary health care**. This is discussed in more detail under in the section on the work of the Red Cross.

-requires manpower and organisational skills

-people need to be persuaded to change their lifestyles.

problems





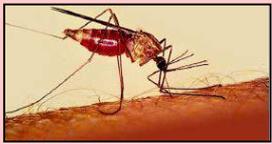
A new drug- based on the common plant **ARTEMESIA** was tried first by the Chinese, then the Americans. It is being used with moderate success today.

No other vaccines have yet been created to kill the parasite in the human body.

The main way of keeping the disease at bay is with precautions taken by the local population and taking regular low-efficacy medicines.

Malaria remains a widespread debilitating and fatal disease in many parts of the developing world.





The role of international organisations: the World Health Organisation (WHO)

- The WHO launched a world campaign to eradicate malaria in the 1950s and 1960s.

They used drugs to cure people and insecticides (DDT) to kill mosquitoes. This was very successful initially and malaria was reduced. But, the campaign finally failed because-

- (a) it was **very expensive** for poor countries to buy insecticides, and
- (b) the **mosquitoes were becoming resistant** to the chemicals used.





The WHO employ scientists to find better ways of curing and preventing malaria.

They developed DDT and, when this became less effective developed dieldrin.

They have also been responsible for introducing the sterile male mosquitoes and the fish that eat mosquito larvae.





The role of aid agencies: the Red Cross

- The Red Cross provides **emergency medical help** (e.g. drugs, equipment, nurses) when **epidemics** of malaria occur.
- They believe as well that "prevention is better than cure". So they also provide **long-term medical help** to improve health conditions, especially in countryside areas.

This involves taking someone from each village and training them in **Primary Health Care**.

That person then becomes a **village health worker**.





Primary Health Care includes giving advice on how diseases such as malaria are spread and low-cost ways of reducing these diseases. These methods include:-

- (1) persuading people to use mosquito bednets
- (2) covering water containers
- (3) filling in puddles
- (4) reducing visits to the river
- (5) cut grass around houses, because mosquitoes use tall grass for resting
- (6) wear clothing which covers your arms and legs, especially at night, when mosquitoes are most active





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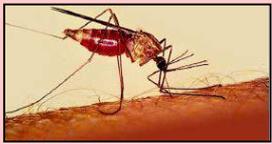
Primary Health care can be very effective because it:

- **involves the local people** (locals are more likely to listen to, and trust, one of their own people instructing them, rather than an outsider).



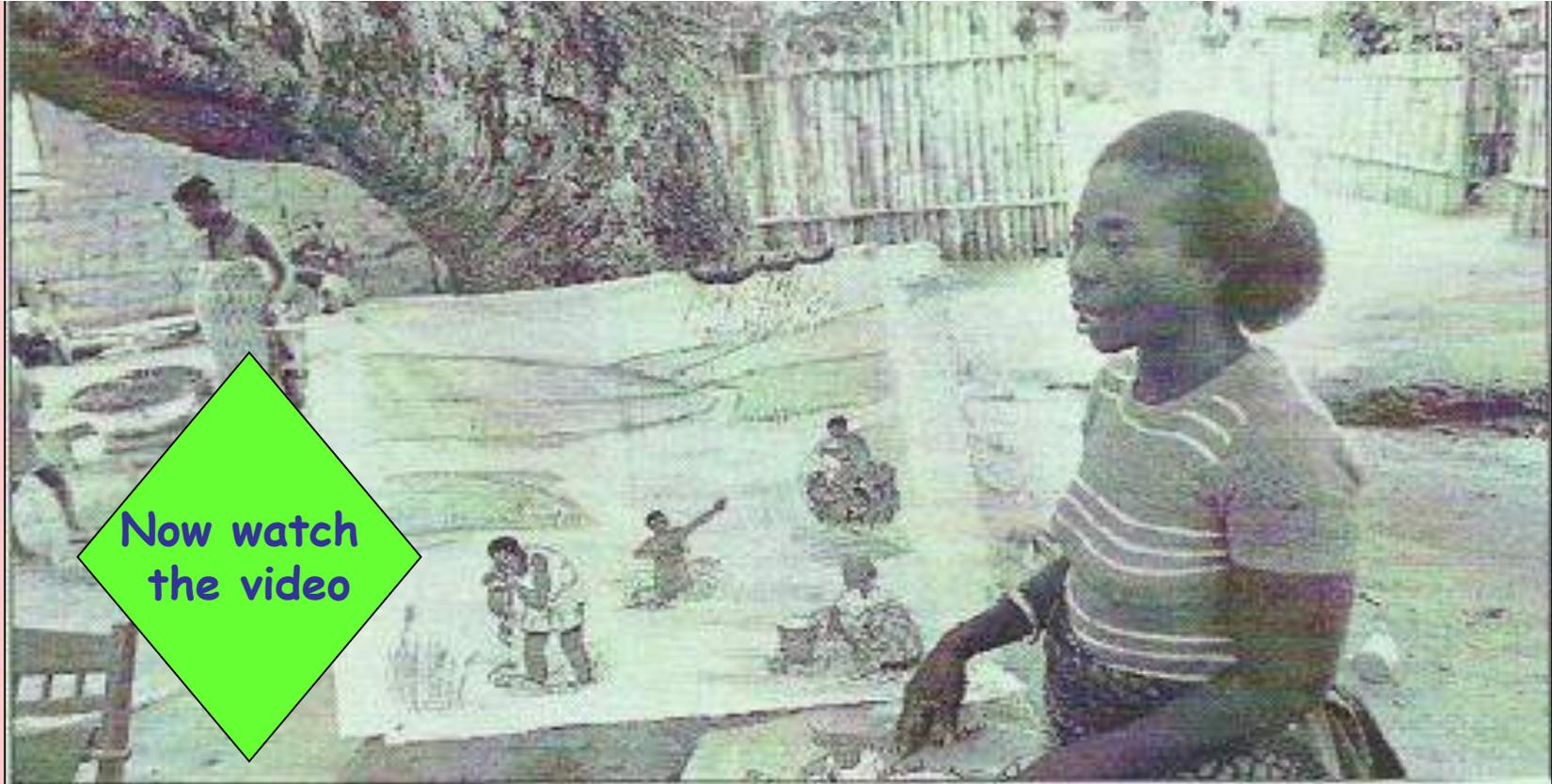
- **cheap methods are used** which are affordable for the villagers.





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This village health worker lives and works amongst her people.
Her first job is to share her knowledge.



Now watch
the video

End

