

# ACTION AGAINST WORMS

MARCH 2003 ISSUE 1



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## WELCOME!

To **Action Against Worms** - the only newsletter to bring you regular reports on how countries are tackling worms. Brought to you by the Partners for Parasite Control, it will be practical, brief and informative with a focus on the two most widespread types - schistosomes and common intestinal worms.

## WHAT CAN YOU EXPECT FROM US?

This first issue answers some key questions: How many people have worms? How do you get them? How ill do they make you? Most importantly, it describes why we should invest in worm control, and how this can be done.

Each subsequent issue will focus on a specific topic. For example, how to set up a deworming day at a school, how to piggy-back deworming onto existing health activities, different ways to reach non-enrolled school-age children, what field survey tools are available and how much they cost. We will also keep you informed of the latest technical findings and simplify them into realistic messages which are applicable for programmes on the ground.

## WHO IS 'ACTION AGAINST WORMS' FOR?

Anyone who is interested in worm control. It will be particularly relevant for country decision-makers and, we hope, persuasive and convincing to donors and governments. It is for people who already work in worm control as well as those who might not realize how massive the problem is, or how simple the solution. It is for people in Ministries of Health and Education, NGOs working in nutrition, water and sanitation and education, for the PPC Partners and for health workers and school teachers at the community level whose work is the key to the success of control programmes.

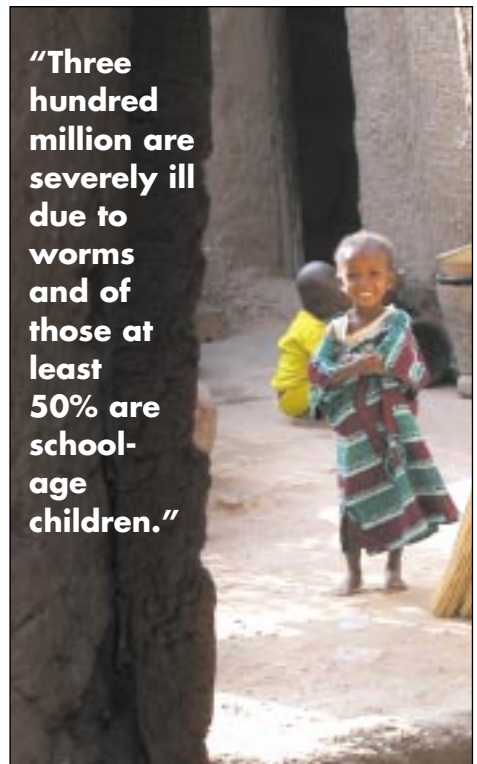


We very much hope that **'Action Against Worms'** is both enjoyable and informative. If you have any comments on existing issues or suggestions for areas you would like to be covered in the future, please do not hesitate to contact us by E-mail at **wormcontrol@who.int**

## HOW MANY PEOPLE HAVE WORMS?

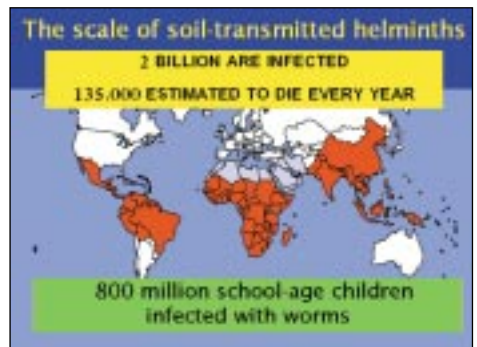
The sheer number of people affected by schistosomiasis (also known as bilharzia) and common intestinal worms (also known as soil-transmitted helminths) is staggering. Around **2 billion people** harbour these infections; in other words, worms infect more than 1/3 of the world's population. **Three hundred million are severely ill due to worms and of those at least 50% are school-age children.**

In 1999, WHO estimated that schistosomiasis and soil-transmitted helminths represented more than **40% of the disease burden** due to all tropical diseases, excluding malaria, and that infectious and parasitic diseases - most of which are preventable or treatable - are the primary causes of death world-wide<sup>1</sup>. Mortality is in fact a rare consequence of parasitic infection, but due to the massive number of people affected world-wide, the number of deaths is substantial. In Africa alone, the death toll due to schistosomiasis may be as high as 200,000 every year. Having said that it is the chronic, long-term - and often insidious - damage to a person's health which is of even greater concern.



## 5 DIFFERENT SCHISTOSOMES, 3 COMMON INTESTINAL WORMS

Over 300 species of worms infect humans. Of these there are five types of **schistosomes** and three different soil - **transmitted helminths** which are the most frequently encountered and the most critical in terms of public health. What distinguishes them apart is their transmission routes, the different illnesses they cause and the regions of the world where they occur.



### SCHISTOSOMES

### GEOGRAPHICAL AREA

#### Intestinal schistosomes

- |                           |                                  |
|---------------------------|----------------------------------|
| 1. <i>S. mansoni</i>      | Africa/Latin America/Middle East |
| 2. <i>S. intercalatum</i> | Africa                           |
| 3. <i>S. japonicum</i>    | Asia                             |
| 4. <i>S. mekongi</i>      | Asia                             |

#### Urinary schistosomes

- |                          |                    |
|--------------------------|--------------------|
| 5. <i>S. haematobium</i> | Africa/Middle East |
|--------------------------|--------------------|

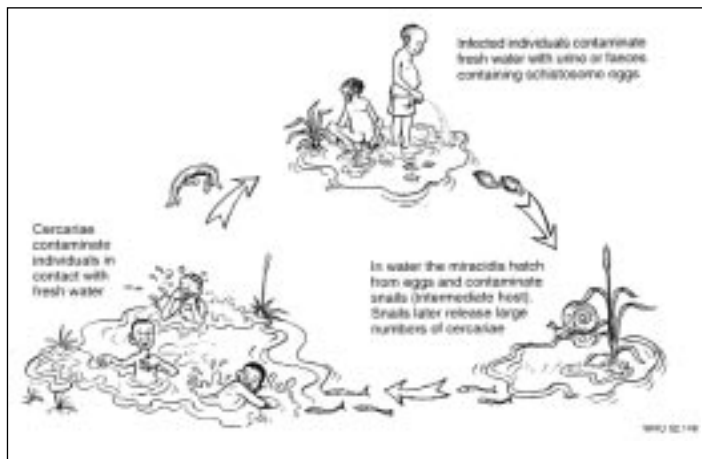
### SOIL TRANSMITTED HELMINTHS

- |               |                                   |
|---------------|-----------------------------------|
| 1. Hookworms  | } Almost all developing countries |
| 2. Roundworms |                                   |
| 3. Whipworms  |                                   |

<sup>1</sup> The World Health Report 1999, Geneva, World Health Organization, 1999.

## HOW DOES ONE CATCH WORMS AND WHO IS THE MOST AFFECTED?

**SCHISTOSOMES** need fresh, still water for their survival. They are therefore found in lake-side communities, around water development schemes like dams and wherever people are in contact with infested water during their normal daily activities of hygiene, recreation or during irrigation farming. Because fresh water is needed, schistosomiasis is only found in specific locations and not universally across a country. Who is most affected? **Children** are nearly always the most heavily infected because they spend

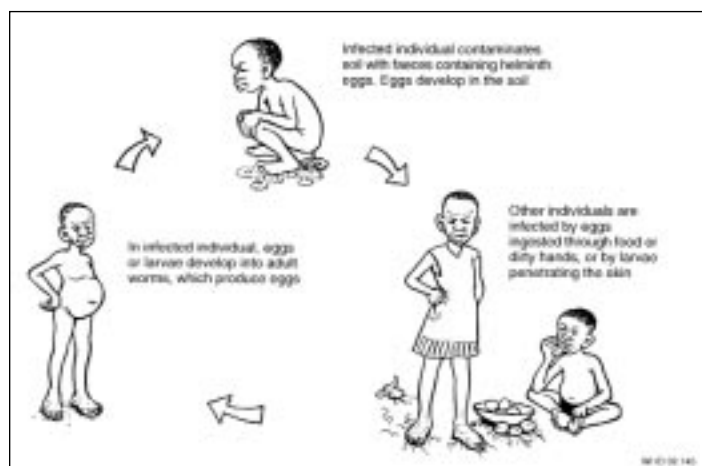


hours playing and swimming in water and lack the partial immunity which adults gradually develop. **Certain occupations like irrigation workers and fishermen** are also especially vulnerable because they are constantly in contact with infected water.



**SOIL-TRANSMITTED HELMINTHS (HOOKWORMS, ROUNDWORMS AND WHIPWORMS).** Unlike schistosomes which require water, soil-transmitted helminths need humid soil. The result is that, unlike schistosomiasis, these worms are not focally distributed, but will occur wherever there is a lack of sanitation and a tropical environment. As a general rule, where there is schistosomiasis, there are likely to be common intestinal worms.

The route of infection for soil-transmitted helminths begins with eggs in human faeces contaminating the soil. People are infected when they ingest the eggs from unwashed food or hands, or - in the case of hookworms, which



penetrate the skin - from walking barefoot or any other direct contact with infested soil. **Children** are likely to be infected from the time they begin to crawl - and will be continually re-infected for the rest of their lives. For **adults**, the problem of whipworm and roundworm becomes less important due to more hygienic behaviours, whereas hookworm infection continues to steadily build up over the years.



## THE IMPACT OF WORMS ACROSS A LIFETIME

How many worms can one cope with and what is the impact on one's health? The simple answer is that a few worms will do little damage to your health. However as the number of worms increases - your so-called "worm load" - illness and disease become progressively more severe and at the same time increasingly irreversible.



**PRE-SCHOOL CHILDREN**



**SCHOOL-AGE CHILDREN**



**WOMEN OF CHILD BEARING AGE**



**SPECIAL OCCUPATIONS**

**Pre-school children** are generally too young to swim and as a result are less exposed to schistosomiasis. Soil-transmitted helminths however start to be a problem. At this age a child needs to be free of disease to grow and develop well. What is increasingly clear is that even low levels of infection make unnecessary demands on a child's resources and well-being and inevitably **growth faltering** begins.

Of all the age groups, **school-age children** - aged between around 6 and 15 years - suffer the most. They are the most exposed to infection which means the number of worms they carry is high. They are also at the peak of their growth and schooling. Worm infections aggravate **malnutrition and anaemia** rates which contribute to retarded growth and make the child more vulnerable to other diseases - compounding the whole situation. In terms of **learning**, infection means a child is sick more often and therefore more often absent from school. Even when they are in class, they are less able to learn well. Treating this group is important for another reason: the damage caused by worm infections in early life is carried over into adulthood. In other words a child who has suffered persistent and heavy infections is likely to have chronic irreversible disease, such as **liver fibrosis, cancer of the bladder and kidney failure** in later life. An estimated 70 million people with urinary schistosomiasis in Africa currently suffer from bloody urine signifying their bladder and urinary tract is damaged. Without treatment, this leads to permanent kidney damage.

**Women** in developing countries may be pregnant or lactating for as much as half their reproductive lives? **Anaemia** is therefore already a life threatening problem. Add to this a diet which is inadequate in iron and worm infections which further worsen anaemia and the result is that a woman's already precarious nutritional status is made even more hazardous. Treatment is therefore crucial - both for the newborn baby since anaemia has a knock-on effect on the birth weight, and for the mother's chances for a safe delivery.

**Fishermen, irrigation workers or women** carrying out their domestic tasks in rivers or lakes are continuously infected with schistosomiasis. Similarly **miners or tea pickers** whose work puts them in contact with infected soil carry very heavy worm loads, especially of hookworm. In addition to the health impacts mentioned above, **economic productivity** can be severely affected.



THE IMPACT

<sup>2</sup> Report of the WHO Informal Consultation on Hookworm Infection and Anaemia in Girls and Women. WHO/CTD/SIP/96.1. Geneva, World Health Organization, 1994.

## THEN & NOW - WHAT SIMPLIFIED THE STRATEGY?

Three very significant changes have moved worm control into the spotlight and allowed for a greatly simplified control strategy.

### 1. DRUG COSTS

The price of the drugs to control schistosomiasis and soil-transmitted helminths have plummeted. Even two to three years ago the price of albendazole<sup>3</sup> (one of the 4 recommended drugs for soil-transmitted helminths), was \$0.20, it is now less than \$0.02. Before the patent was lifted for praziquantel (the recommended drug for schistosomiasis), the price was around \$3, it is now less than \$0.07 per tablet.

This almost single handedly revolutionized control strategies and opened the door for a greatly simplified approach. When the price of drugs was high, each person was screened for infection and then treated accordingly. Today individual diagnosis for infection is between four and ten times as expensive as the treatment itself and it is now possible, especially since the drugs are safe even when given to uninfected people, to treat entire high risk groups like school-age children.

### 2. TREAT, TREAT AND TREAT AGAIN

Twenty years ago, the goal of any worm control strategy concentrated on reducing the *number of people* who were infected. The problem with this approach was that unless sanitation in the area was improved, people were constantly re-infected and the absolute numbers rarely showed any long-term decline. The estimated percentage of people infected with worms in Africa for example, has not dropped despite control efforts in the 1980s.

The approach is now radically different. It is now clear that instead of reducing the *number of people* with worms, reducing the *number of worms* in each person is vitally more important for that person's health. This approach implicitly recognizes that re-infection will occur until effective clean water and sanitation facilities are installed. While these are hugely important, they take time. If on the other hand one regularly treats high-risk groups the infection is never allowed to develop into critically debilitating disease. Nor does it so severely affect all aspects of a child's development that he does not have the chance of becoming a healthier adult.

**A combined control strategy for both schistosomiasis and the common intestinal worms is logical**

- They both thrive where **poverty, malnutrition, inadequate sanitation** and minimal health care and awareness exist.
- The **high-risk groups** for the two infections largely overlap.
- These groups can easily be reached through the **same, existing channels**.
- For both infections the first goal is to **control disease** rather than prevent re-infection.

### COST PER CHILD

Using the school system for delivery, the cost of treating a child is usually less than **0.50 US\$ per year** where both schistosomiasis and the common intestinal worms are present. Where only the latter exist, the cost is less than **0.25 US\$ per child per year**. This price covers the cost of the drugs, their delivery, equipment, health education materials, training for implementing personnel, and monitoring and evaluation<sup>4</sup>.



**The claim that therapy is irrelevant because children become re-infected collapses in the face of the remarkable improvement in health achieved after treatment.**

<sup>3</sup> The recommended drugs for treating soil-transmitted helminths are albendazole, mebendazole, or levamisole or pyrantel.

<sup>4</sup> Prevention and Control of Schistosomiasis and Soil-Transmitted Helminthiasis: First report of the Joint WHO Expert Committees, WHO, Geneva, 2002; Helminth control in school-age children: a guide for managers of control programmes, WHO, Geneva, 2002.

We would like to thank The Bill & Melinda Gates Foundation for their generous financial assistance which has made this publication possible.

### 3. PIGGY-BACKING FOR THE LONG RUN

It is clear that regular treatment programmes can dramatically reduce disease, but most programmes collapsed for two fundamental reasons:

- They were funded externally with short time horizons
- Parallel and vertical structures were installed for their implementation

Successful programmes today are those which were planned and funded with a long-term perspective. This is one of the driving principles of the new approach - deworming can and should be piggy-backed onto existing networks. Not only does this slash the cost of delivery, but it also makes the programme intrinsically more stable and long-lasting. Certain systems are ideal for deworming to be integrated onto; three are listed below.

#### • USE SCHOOLS

The school system offers one of the most efficient ways of reaching school-age children and has other clear advantages:

- Teachers, with minimal training, can organize deworming days and safely administer the drugs.
- Even where school enrolment rates are low, there are ways to reach non-enrolled school-age children who also need treatment.
- Regular deworming means that children are healthier, leading to increased enrolment and attendance, reduced class repetition and increased educational attainment. Those who gain the most are the most disadvantaged: girls and the extremely poor.
- Delivering deworming programmes through schools is the most cost-effective way to regularly treat one of the key high-risk groups.

#### • USE EXISTING HEALTH SERVICES

A sick person must be able to find treatment close to their home. This means that drugs must be available at local health facilities and since diagnosis is not necessary, treatment in endemic areas can simply be based on symptoms. Routine health activities, such as mother and child health clinics, vaccinations or during family planning, also offer excellent opportunities for deworming.

#### • USE SPECIAL HEALTH CAMPAIGNS

Mass health campaigns also offer the opportunity to reach thousands of people very effectively. These include national immunization days, vitamin A supplementation programmes, feeding programmes, and water and sanitation initiatives.



### INVOLVING NON-MEDICAL PEOPLE

Deworming requires no specialized training, no injections, no complicated drug regimens. The drugs are single dose, safe and easy to administer. What this means is that non-medical people, for example **school teachers**, can be given a basic training which allows them to distribute the drugs. There are two immediate advantages to such an approach. First it takes some of the pressure off already overloaded district health staff. Two, teachers are often respected and trusted members in a community making them extremely well-placed to carry out such activities.

### SUMMARY BOX:

#### The Worm Control 'Package'

- Make sure that anthelmintic drugs are available in local level health services
- Regularly treat high-risk groups
- Piggy-back onto existing channels
- Educate communities to change behaviours
- Promote clean water and sanitation

### ACT NOW!

Today converging issues make it a vital time to take action on worms

- **It's cheap:** The price of the recommended drugs has plunged, and can be delivered through existing channels
- **It's worth it:** For a few extra cents one can make a huge difference
- **It's easy:** The new worm control package is easy to carry out
- **So everybody can do it!** If every-one working in endemic areas added deworming to their routine activities, illness due to worms would rapidly become a thing of the past

#### USEFUL WEB SITES AND RELEVANT DOCUMENTS FOR THIS ISSUE:

Report of the Secretariat 54th WHA May 2001

[http://www.who.int/gb/EB\\_WHA/PDF/WHA54/ea5410.pdf](http://www.who.int/gb/EB_WHA/PDF/WHA54/ea5410.pdf)

WHA Resolution WHA54.19 22 May 2001

[http://www.who.int/gb/EB\\_WHA/PDF/WHA54/ea54r19.pdf](http://www.who.int/gb/EB_WHA/PDF/WHA54/ea54r19.pdf)

Prevention and Control of Schistosomiasis and Soil-Transmitted Helminthiasis: Report of a WHO Expert Committee: WHO Technical Report Series 912. WHO 2002

Schistosomiasis and soil-transmitted helminth infections: forging control efforts. Savioli L, Stansfield S, Bundy D et al. Transactions of the Royal Society of Tropical Medicine and Hygiene (2002) 96, 577-579.

Evaluation of staff performance and material resources for integrated schistosomiasis control in Northern Senegal. Van der Werf M et al. Vol 7. No. 1. January 2002. 70-79