

THE GLOBAL ALLIANCE TO ELIMINATE LYMPHATIC FILARIASIS
WEBSITE: <http://www.filariasis.org>

The Global Elimination of Lymphatic Filariasis

The Story of Egypt



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Introduction

This is the story of Egypt's efforts to rid itself finally of lymphatic filariasis (LF), an ancient and disfiguring disease.

Above all it is the story of a bold national effort combined with unprecedented public–private international cooperation. The LF elimination programme in Egypt faced the daunting challenge of mass drug administration (MDA) – using a combination of drugs – to 2.5 million people over a two–week period every year for five years. Egypt's programme is a pioneer in this field – and the world is waiting to see whether such a large–scale undertaking can succeed in eliminating the disease in a relatively short period of time.

Historically, control of LF in Egypt has been fairly successful in some areas and less so in others. The Egyptian government has now resolved to try to rid the country of this debilitating disease once and for all. The national campaign is supported by all the available resources of the Ministry of Health and Population and of the primary health care infrastructure and by unique public–private partnerships developed with WHO within the framework of the Global Alliance to Eliminate Lymphatic Filariasis.

Egypt's story is particularly interesting because the country's LF elimination programme is the first to treat a large population from the outset, rather than scaling up over a number of years. Subsequently, few countries have adopted this method: the logistic difficulties of such large–scale implementation are formidable and, once a programme of this type has started, the momentum must be maintained – stopping halfway is not an option.

This story charts both the progress made during the period 2000–2002 and the challenges that lie ahead. Although it is aimed primarily at the non–specialist, the story will also interest the specialist, since Egypt's experiences may hold lessons for other endemic countries hoping to plan and implement successful programmes.

Much can be learned from every country and campaign. As well as the common concerns, there are likely to be unique aspects – for example the geography of the country and the culture of its peoples. It is hoped that by analysing and distilling the experiences of countries such as Egypt, it will be possible to identify those features of elimination programmes that have been most successful and to apply them in areas where campaigns have yet to begin.





(a) A mosquito taking a blood meal;
(b) *Microfilariae* circulating in the blood

What is lymphatic filariasis?

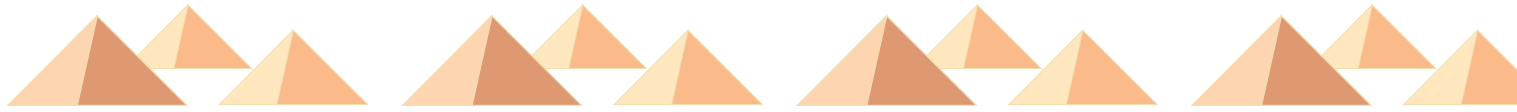
Lymphatic filariasis is one of humanity's oldest and most debilitating diseases, but few people have heard of it, let alone know anything about it. It doesn't make the headlines and it doesn't kill outright – but it causes permanent disability, silently destroying people's lives. The facts are intimidating:

- LF currently affects more than 120 million people worldwide.
- LF parasites are found in 80 countries around the world, which means that more than one billion people – or one fifth of the world's population – most of whom are the world's poorest, are at risk from the disease.

Lymphatic filariasis is a parasitic disease that is spread by mosquitoes. A thread-like worm causes the disease, which depends on two hosts: humans and several species of mosquitoes that plague tropical countries. The mosquito ingests microfilariae when it bites a person. These microfilariae undergo a process of transformation in the mosquito to become infective larvae, which enter the blood stream of another person through mosquito bite. The microfilariae mature into adult worms which can live for several years in the person's lymphatic system, producing millions of microfilariae that circulate in the peripheral blood stream, usually at night.

The worms lodge in the lymphatic system — a network of nodes and vessels that regulate the delicate fluid balance between the tissues and blood and are essential for fighting infection — causing stagnation of the lymph and swelling. The resultant damage manifests itself as the grossly enlarged lower limbs or external genitalia of elephantiasis and hydrocele.

Although the majority of people infected with the filarial parasite have no outward symptoms, virtually all of them suffer subclinical lymphatic damage. Some 40% of those infected suffer renal damage, resulting in blood and an excess of serum proteins in the urine. The most obvious manifestations of lymphatic filariasis are enlargement of the entire leg or arm, the genitals, vulva or breast commonly referred to as elephantiasis.



In Egypt, the effects of elephantiasis are often concealed under the *galabiyya* or long-flowing robe. The disease still carries a stigma and can be particularly distressing for girls because it affects their marriage prospects. Corrective surgery can help in some cases, but is expensive and generally beyond people's financial reach. Those who must continue to live with this debilitating and disfiguring condition have to cope not only with the physical problems but also with the psychological impact, which is almost incalculable.

Perhaps paradoxically, the efficiency of LF transmission is actually quite low. Generally, a person needs to be exposed to many mosquito bites over a period of months or years before becoming infected. By contrast with malaria, which can be caused by just one bite from a

malaria-carrying mosquito, several hundred bites from LF-carrying mosquitoes are probably necessary to establish the disease. The microfilariae are not injected when the mosquito bites – they must migrate through the puncture site. Moreover, unlike malarial parasites, microfilariae do not multiply – they simply mature, one microfilaria developing into one infective larva.

Although there is no cure for elephantiasis, simple measures are available to give sufferers a better quality of life – and to halt transmission of the disease, guaranteeing that future generations will never be at risk.



Living with filariasis

Darwish Hamdy Ahmed Darwish Hamdy Ahmed is a fisherman living in Kafr Meghezel village in Kafr El Sheikh governorate.

He and his two small grandchildren are the only members of the family who don't have LF. Darwish's wife, four children and mother-in-law have all developed early symptoms of elephantiasis. Just outside their house is an open sewer – the perfect breeding ground for the *Culex* mosquitoes

that transmit LF. Darwish believes that the only reason he has not been infected is because he is so often away at sea, fishing – and he is frightened that his grandchildren may well develop the disease.



Darwish's family are lucky – so far, the disease hasn't had too much impact on their lives, and they have learned to take care of their swollen legs to prevent further infections. His wife Amel continues to make and repair traditional fishing nets and gets on with life as best she can. However, the family worry about the risk from the sewer. They say they can't afford to do anything about it. When they heard about MDA they welcomed it and made sure that they and all their friends took the drugs. "It's important that nobody else gets this terrible disease," says Darwish.

Awatif Mohamed has had elephantiasis in her leg for six years and suffers pain at times. Her condition began with a fever and swelling. Eventually, her doctor told her she had LF, which had caused her leg to swell. She knows there is no cure, but taking the drugs every year has stopped her condition from getting worse and prevented the disease from being passed on to others. Awatif says the drugs don't taste very nice, but she tells her family to take them. She says, "I'm very happy about the drugs and the efforts being made to eliminate lymphatic filariasis."



Fatma Mahmoud is unusual because both her upper and lower limbs are affected by LF and her hands are badly swollen. She has had the disease for 25 years – but these days it's rheumatic pain and deafness that she complains of most.

Fatma has taken the combined drugs each year for the past two years. Although she still gets acute attacks of inflammation and infection from time to time, she has been shown how to look after her legs, do exercises and keep her skin clean to prevent further infections and stop the swelling from getting worse. Fatma says she feels very sad about her condition. It is clear from talking to her that it has had a tremendous psychological effect on her. "I'm unhappy about it," she says, "But what can I do? Only God can help me."



The Global Programme to Eliminate Lymphatic Filariasis

In 1997 the World Health Assembly of WHO decided that lymphatic filariasis should be eliminated as a public health problem, and outlined a strategy to achieve that goal.

Elimination of lymphatic filariasis means a reduction of the disease incidence close to zero as a result of continued and coordinated activities. WHO's strategy comprises two components – interruption of transmission, and care for those who already have the disease.

To interrupt the transmission of infection, the entire population at risk must be covered by mass drug administration (MDA) for a period long enough to ensure that the level of microfilariae in the blood remains below that which is necessary to sustain transmission.

The first treatments began in 2000, involving just over three million people in 12 countries, and the numbers have been accelerating from year to year. By 2001, the Global Programme to Eliminate Lymphatic Filariasis had reached more than 26 million people through MDA in various countries. This figure was expected to triple in 2002, to 70–80 million people, and should reach 800 million per year when the LF elimination programme is running full scale – the Global Programme involves probably the largest drug administration the world has ever known. The exciting – yet formidable – challenge is to treat not only the 120 million people already infected, but also the 1.1 billion who are at risk of LF worldwide. By the target date of 2020, it is hoped that LF will be a disease of the past, existing only in medical textbooks.

This is the first campaign that has tried to eliminate a disease by drugs, and it presents an intimidating challenge.

In Egypt, albendazole is being used in combination with diethylcarbamazine (DEC); mass administration of these drugs has the twofold purpose of preventing future cases of LF and helping those people who are already suffering from the disease. Many of the adult worms are killed by DEC, and albendazole may have a sterilizing effect such that the females produce fewer microfilariae during their reproductive cycle. The main aim of MDA is thus to eliminate the microfilariae from the peripheral blood system of affected individuals for at least five years – which is the approximate reproductive life-span of the adult worm. During that period, worms that have not been killed by the treatment will die naturally. Thus, after at least five years there should be no adult worms left in the host population and, with the transmission cycle broken, no infection would occur.

Concern about possible side-effects is an obvious issue facing any programme of drug administration. Albendazole has been available for some thirty years and is well tried and tested. While there are side-effects, they are generally mild and self-limiting; for the most part they are due to the effect of the drugs on the parasites, rather than a characteristic of the drugs themselves. Some individuals, especially those with a high level of infection, may experience moderate to severe reactions, but these usually disappear after two or three days.

In a campaign of this type it is crucial to explain to the population what they can expect when they take the drugs, and to reassure them that some of the side-effects they may experience are actually a part of the therapeutic effect. Headache, rash or slight nausea may be caused by the microfilariae dying within the body.

It is highly unlikely that LF elimination campaigns will face the problems of drug resistance that have arisen with antimalarial drugs because of the much longer generation time for the parasite. The very rapid turnover of the malaria parasite means that a resistant gene is easily passed on from one generation to the next; this is not the case with LF, because the adult worms live for a long time.

Opportunities:

- MDA involves the use of drugs only and not vaccines (which require cold-chain storage).
- MDA is a single, synchronized effort once a year for at least five years. Unlike, for example, HIV/AIDS campaigns and guinea-worm eradication efforts, it does not require people to change their behaviour significantly.
- The additional health benefits of deworming tablets are evident, so people are eager to take them.
- The economic benefits of LF control are clear and unequivocal. In India, for example, where almost one-third of all cases occur, it has been estimated that LF costs almost US\$ one billion in lost productivity every year.

Challenges:

- The campaign has to be sustained over a period of at least five years.
- Enormous numbers of people will need drug treatment – not only the 120 million already infected but also the 1.1 billion people who are at risk.
- People who are not ill have to be persuaded to take the drugs.
- Organization of a campaign of this nature requires extensive community participation and complex logistics.
- Care of affected limbs will require long-term behavioural changes for those who already have LF.
- It is difficult to get donors from wealthier countries that are not at risk from this disease.



Egypt: a country profile

Herodotus wrote in the fifth century BC that “nowhere are there so many marvellous things” as in Egypt, “nor in the world besides are to be seen so many things of unspeakable greatness”. Like most developing countries, however, Egypt is struggling to solve many competing health problems with limited resources. Communicable diseases currently represent the most important challenge for the country.

FACTS AND FIGURES

Official Name: Arab Republic of Egypt.

Government type: Republic.

President: Mr Mohamed Housni Mubarak.
(1)

Area: Egypt has a total area of 997 739 km² (1). Maximum distance north–south is about 1085 km and east–west about 1255 km.

Population: 69 080 000 (2001 estimates) (2). Almost 99% of the population lives within the Nile valley and delta, which constitutes less than 4% of the total area. (1)

Capital city: Cairo.

Official language: Arabic. (3)

Gross national income per capita: US\$ 1380 (1999). (4)

Natural resources: petroleum, natural gas, iron ore, phosphates, manganese, limestone, gypsum, talc, asbestos, lead, zinc. (1)

Agricultural products: cotton, rice, corn, wheat, beans, fruits, vegetables; cattle, water buffalo, sheep, goats. (2)

Export commodities: crude oil and petroleum products, cotton, textiles, metal products, chemicals. (2)

Import commodities: machinery and equipment, foodstuffs, chemicals, wood products, fuels. (2)

Sources: (1) Arab League

(2) United Nations Population Division (UNPOP)

(3) Central Intelligence Agency (CIA) World Fact Book 2002

(4) World Bank



Egypt's history is inextricably linked to the Nile

Modern Egypt is a fusion of its Pharaonic past, the legacy of the Greeks, Romans and successive Islamic dynasties, and of the often incongruous influences of the 20th and 21st centuries. Ancient monuments and mud-brick villages stand side by side with modern steel and glass skyscrapers. Donkey carts compete for space with motor vehicles on congested roads. In some parts of the country, farmers till the earth with simple tools and Bedouins live in goatskin tents, just as they have done for generations, while half an hour's drive away city sophisticates in Cairo wear the latest fashions and carry mobile phones.

Egypt's history is inextricably linked to the Nile. The fertile flood plain of this vast river has been the source of social, economic, political and religious life since the area was first inhabited – yet is also the main reason why Egypt suffers from LF and elephantiasis and has done for centuries. An autopsy on the 3000 year-old mummified body of Natsef-Amun, a priest during the time of Ramses XI, revealed LF worms in the groin region. The disease is prevalent mainly in the Nile delta region. Although it is found in some villages quite close to Cairo, LF has not got a foothold in the city despite the mass migration that has taken place in recent years.

Egypt has been trying for many years to eliminate LF, with some degree of success. Baseline data on the prevalence and incidence of the disease were established in

the mid-1960s, when mapping revealed ten endemic regions or governorates and an estimated 10 million people then thought to be at risk. In 1975, the Ministry of Health and Population launched the filariasis control section to identify cases of elephantiasis in the villages and to determine the prevalence of the disease among the people. In some areas infection rates among the population were shown to be as high as 20%. Blood samples taken at night identified infected individual, who were then treated with DEC. By the late 1990s this approach had reduced prevalence rates to about 10% and the number of infected villages from more than 350 to 178. However, the use of DEC alone was clearly ineffective in eliminating the disease completely, and some 2.5 million people remain at risk today.



The Minister of Health and Population, His Excellency Dr Mohamed Awad Tag El-Din, supervises the campaign.

Mass campaigns against other diseases such as polio and schistosomiasis have given medical staff in Egypt valuable experience of programmes on a national scale, and – recognizing how damaging and debilitating LF can be – the Government of Egypt took the bold step of committing extensive resources to a radical elimination campaign against the disease.

The Ministries each have a different but coordinated role to play in the social mobilization campaign.

When the Global Programme to Eliminate Lymphatic Filariasis began discussing the global campaign, countries were asked to prepare and present plans. Of the three LF-endemic countries covered by WHO’s Regional Office for the Eastern Mediterranean (EMRO) – Egypt, Sudan and Yemen – Egypt was the only one that had already made a full assessment of the situation. According to Dr Zuhair Hallaj, Director of the Communicable Diseases Control Division in EMRO and the WHO Representative in Egypt, “They knew what the infection rates were and where the endemic villages were. In the other two countries, we know that the disease is present, but we don’t know the prevalence and degree of infection. Here, we had a good picture on which we could build a plan of action.”



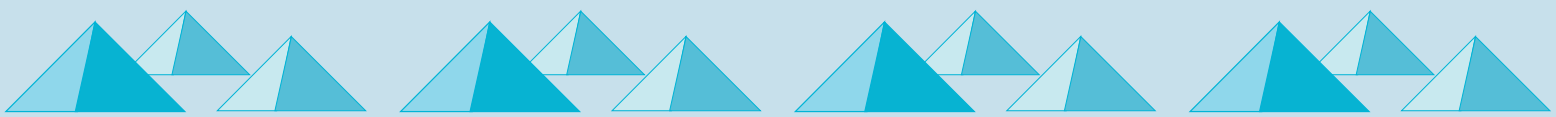
"There's good cooperation between the ministries" says Dr Abdul Azim Tantawi

The plan of action was discussed and approved by the Programme Review Group, and detailed planning – who would administer the drugs, who would conduct the necessary training – began. WHO developed the training models and worked on the social mobilization elements of the campaign in conjunction with officials of the Ministry of Health and Population, who would implement the campaign, and GlaxoSmithKline, who would donate one of the two drugs needed. The Egyptian campaign is now in its third year.

Political commitment is the mainstay of any national campaign of this kind and the Minister of Health himself takes an active part in the planning and supervision of the campaign. The Minister chairs a planning committee for the campaign which, because it is a national campaign with many key players – the Ministries of Education, Information, Agriculture and also Religious Affairs – provides a cross-sectoral approach. The Ministries each have a different but coordinated role to play in the social mobilization campaign. Because the campaign has so many elements, the exact budget is difficult to define, but Dr Mahmoud Abu Nasr, First Under-Secretary of Health at the Ministry, believes there are adequate resources in

terms of budget and human resources to implement the campaign efficiently. "It is not easy but we can do this programme with the resources we have."

Mass drug administration started in 2000 and covered 1 900 000 people. Drugs were distributed to 2 300 000 people in the 2001, and the target for the 2002 MDA was 2 500 000 people.



EGYPT

Governorates where lymphatic filariasis is endemic

1. Qulubeia
2. Menoufeia
3. Sharkeia
4. Kafr El-Sheikh
5. Dakahleia
6. Gharbeia
7. Giza
8. Assiut





The strategy

Months of preparation and training preceded the launch of the LF elimination programme in Egypt. The first task for the Ministry of Health and Population was to review and revise their data on endemic areas to ensure that they were up to date and accurate. This involved medical teams visiting people in their homes and taking night blood samples to determine rates of infection. Before this could be done, however, people had to understand why it was necessary – the teams could not simply turn up and demand blood samples – and social education and mobilization were therefore important factors from the outset of the programme.

A national infrastructure already existed to support the programme, with MDA being supervised by the Ministry of Health

and Population's Malaria, Filariasis and Leishmaniasis Control Department. Ain Shams University in Cairo cooperates with the government in the elimination programme, and WHO provides technical advice and evaluation and monitoring. Early in the programme, WHO supported pilot projects in two villages, which helped in the formulation of a strategy for organizing MDA and in identifying potential difficulties.

The village was selected as the most effective implementation unit for MDA – Egyptian villages are often sizeable, with populations of 25 000 or more. The once-yearly treatment is a combination of a single 400-mg dose of albendazole with a number of DEC tablets based on the age of the individual. The drugs are intended principally to kill the microfilariae



circulating in the peripheral bloodstream, so that there are no transmission stages for the vector mosquito to pick up. If the drugs are administered once a year for five years – which is the average reproductive lifespan of the parasite – the transmission cycle should be broken and no further cases of LF should occur.

Although there have been many national campaigns in Egypt before, for diseases such as polio, this is the first to target such a large number of people and to be based on drugs rather than vaccinations. Apart from the huge task of distributing the free drugs, the demands of training key medical staff, organizing transport, setting up epidemiological monitoring



and surveillance, and educating the public through social mobilization are significant.

Everyone – infected or not – must take the drugs to ensure that the cycle of transmission is broken. One of the main problems in the first round of MDA was persuading people who were not ill to take the drugs; they had to be informed about the risks of the disease, persuaded that MDA was necessary, and reassured about the safety of the drugs. There was some initial reluctance in some quarters, and a real risk that the campaign would be undermined by misinformation or unfounded rumours. Effective social mobilization and information programmes were critical. “We told them the facts,” says Dr Nikolai Neouimine from EMRO. “They also know the problems associated with elephantiasis because they see the clinical cases in their villages.”

The most important factor in the Egyptian elimination campaign has been the existence of an efficient primary health care system at village level, which can be mobilized to reach people on a house-to-house basis. The strength of this system has been an effective foundation for MDA in Egypt and helped to maintain the momentum of the campaign from year to year. Local medical staff, who often come from the villages and are well known by the people, work closely with other community bodies (such as religious, educational and agricultural organizations) and play an essential part in mobilizing people and convincing them of the importance of the programme.

The primary health care units mapped each village and divided them into several sectors. The numbers of tablets needed to cover the entire population of the endemic areas – a total of 2.5 million people – was then calculated. It was decided that, for each sector, there would be a team of three (doctor, nurse and records clerk) who would visit every house to distribute the drugs.

WHO assisted the Ministry of Health and Population in training the primary health care staff responsible for distributing the drugs in their villages. Training of key medical staff has taken place in every year of the MDA campaign. Staff are taught how to inform people about the importance of the campaign; how to calm any fears and persuade people to accept the drugs; how to calculate the number of tablets needed according to the age of the patients; and how to ensure that the



tablets are taken properly. They are also taught about the possible side-effects of the drugs (fever, vomiting, scrotal discomfort, etc.) and trained to reassure people that the drugs are safe and that the side-effects are short-lived, easily managed, and a sign that the drugs are working.

Drug administration takes place in the late afternoons and evenings, when people are more likely to be at home. Pregnant women and babies and individuals who are seriously ill are exempt from taking the drugs; if people are away from home, in the army for example, the medical teams call again later to give them the drugs. "If anyone is missed, we go back until we get them," says Dr Hussein Kamal, Director of the Malaria, Filariasis and Leishmaniasis Control Department at the Ministry of Health and Population.

The second most important factor is the strength of support being given to the LF elimination campaign in Egypt by a number of academic and research institutions. The Vector Control Programme at Ain Shams University in Cairo has brought to the campaign its many years of experience in LF research and its intimate knowledge of the disease in Egypt.

Washington University in St Louis, MO, USA, was the first university outside Egypt to lend collaborative research support to the campaign, and has been joined by others, including the Rollins School of Public Health at Emory University (USA) and the Liverpool School of Tropical Medicine (United Kingdom).





Building on past experience

Egypt is now halfway through its elimination campaign, having already reached an impressive 2.5 million people – almost 89% of the at-risk population – with MDA in 2000 and 2001. The LF elimination team was therefore determined that the third two-week campaign, to be held between 9 and 23 September 2002, would be equally impressive.

During the first two campaigns, the response of the population was extremely positive. “We didn’t expect this, because it was the first time, and we expected many people would refuse to take the drugs,” says Dr Nikolai Neoumine. “But when we started the campaign, we found an excellent response from the people. Villages that didn’t have cases of lymphatic filariasis even complained about not receiving the drugs.”

In a way, those who have the disease are the most powerful advocates in persuading others to take the drugs.

Medical staff at all levels, from the Ministry of Health and Population down to local village teams, say that MDA has become easier each year – people already know about it from the previous year and

understand that the teams will return. The medical teams have compiled lists of people in the villages, and know exactly who should take the drugs; they can therefore work through them more efficiently, and MDA will take less time.

Infection rates fell dramatically in many areas after the first round of MDA. As a result, there were fewer side-effects to treat the following year and – as the overall benefits of the treatment became apparent – far fewer reservations about taking the drugs. Albendazole is also an effective broad-spectrum antiparasitic, and the villagers could quickly see the benefits of treatment with this drug: deworming young children brings significant improvements in their growth, health and intellectual potential.





Notwithstanding the benefits of MDA, a campaign of this magnitude has met with a number of problems:

- In the first year, there was a shortage of trained doctors and nurses to meet the demand.
- Some of the smaller villages and hamlets were missed in the first round and have had to be included in subsequent years.
- Some districts complained of a shortage of drugs, although this was largely a result of demand for the drugs from villages in non-endemic areas that also wanted to receive the drugs to get rid of other internal parasites.

“You wouldn’t believe the response,” says Dr Zuhair Hallaj. “We were receiving direct requests from villagers saying they had been missed and please don’t miss us next year. So we had to reassess the situation and, in the second year, we had to include all the hamlets around the villages to be treated, so as not to miss anybody out. The campaign was successful because people were already accustomed to mass treatment campaigns, such as for schistosomiasis.”

By the time the third round of MDA started, many of the earlier problems had been ironed out. “Our plan is always adapted from year to year,” says Dr Mahmoud Abu El Nasr. “The first year we had many problems, but now the people are accustomed to this drug administration and have seen for themselves that

there are no significant side-effects from the drugs. They see the benefits and have been convinced by the campaign. We are confident that this year’s campaign will be much better than the last one. We will continue these annual campaigns until September 2004, and I think that by then we will be able to declare Egypt free of lymphatic filariasis.”

“Feedback is very, very important in a campaign like this,” says Dr Mahmoud. “It is essential to know about the effect of your messages and information, so we always seek the opinions and experiences of people.”



The main difficulty from here on may be the possibility of the “fatigue factor” as the campaign enters its final phase; it is crucial to keep medical staff motivated and the social mobilization messages fresh and alive. However, Dr Hallaj says that he hasn’t noticed any fatigue yet. “We are telling people that two years have passed, this is the third year and we are on the way.”

According to Dr Hallaj, community involvement through social mobilization will be the key to Egypt’s success. “The main thing is that the community should know that it is for their own benefit. It will let them be healthier and live better lives. You should try to get everybody in the community to participate in the social mobilization. It shouldn’t be just a governmental campaign: it should be a national and a community campaign working together. If a national campaign involves only the government, it will not work. A national campaign means everyone must participate. Health *for all by all*, or it will never happen.”

“WHO regards the Egyptian programme as a pioneer in this field, and the whole world is waiting to see whether this large-scale effort can eliminate lymphatic filariasis within a given number of years.”



Living with filariasis

Dr Alaa Shaath works at the Integrated Hospital in Al Gizira El Khadraa (Motobes, Kafr El-Sheikh Governorate).

"We will give drugs to about 22 000 people in one village and 12 000 in another. The villages are divided between 12 teams, consisting of a doctor, a nurse and a records clerk, who will visit the people in their homes. We will give one tablet of albendazole and, according to the person's age, a number of tablets of DEC. The campaign will continue for 15 days. Today is the first day and we hope it will be a successful campaign."

Dr Alaa says that the response has been excellent. "This is the third campaign for us and so people know about it now. There have been no problems this time, although in the beginning there was some resistance. People knew that there is no cure for elephantiasis, so they thought the drugs wouldn't help. Now people know that the drugs can help prevent the disease and they are cooperating with us."



Haq Mahmoud has suffered from LF for twenty years and both his legs are hugely swollen. He used to work as a fisherman but cannot any longer, so now he has to rely on his son to look after him. Haq is a large, jolly man who says he hasn't suffered any stigma in his village because of his condition; he shows himself to friends and family as an example of what could happen if they don't take the drugs. He hopes he can one day get treatment abroad.



Amina has had elephantiasis of one leg for about twenty years, but is relatively lucky. She takes good care of herself by keeping the leg clean and free of infection, and has had no acute attacks. When she feels pain, she rests, but otherwise she's able to carry on with her chores or play with her grandchildren.





Social mobilization and mass drug administration

Social mobilization knits together the entire elimination effort. A broad spectrum of involvement and support is crucial if the very high coverage necessary to break the LF transmission cycle is to be achieved over at least a five-year period. The Egyptian government recognized from the outset that MDA simply would not work without active support from an informed and involved public.

The Egyptian programme has used a variety of formal and informal channels to reach people with the message that MDA is very important and needs their support and continued commitment. National and local political leaders, trained health workers, religious leaders and teachers, plus the mass media, all have a part to play in this social mobilization. They are in a position to use their influence both to

get people to accept and support the campaign and to help increase the value that people place on the campaign when they understand its benefits.

Primary health care workers at village and district level are the backbone of the social mobilization campaign. The doctors and nurses responsible for the house-to-house drug administration usually live locally and are well known, so they are also able to persuade people of the need to take the drugs and to allay their fears. They may even take the drugs themselves.

Each year, banners and posters in the villages advertise the MDA campaign, and some health authorities also distribute pamphlets door to door. National television has proved very effective in the campaign because it has a very broad reach throughout the country and is available in even the most remote villages. Since television is also state controlled, specially formulated messages, films and advertisements can be aired at peak viewing times to prepare people for the campaign, inform them of the risks of LF, and encourage them to support MDA. High-profile interviews with the Minister of Health and Population and the head of the Ministry's LF team mark the start of each year's campaign and reinforce campaign messages throughout the two weeks of MDA.



Social mobilization has been

Initially, the main problem was to persuade people to take drugs for a disease when they may not have had any symptoms. "In the first year, we had many people who refused to take the drugs," says Dr Maged El Setouhy of Ain Shams University, "but we stepped up the social mobilization campaign with a movie and more posters and so on, and we asked for help from the imams of the mosques and others."

The involvement of religious leaders has also proved a powerful means of delivering the message. The imams make announcements in the mosques explaining the need for the campaign and urging people to support MDA. "Those who don't want to watch television will be in the mosque," said Dr Maged, "so we get them that way!"

Gamal Hefni is head of the people's council in the village of Al Gizira El Khadraa (Motobes, Kafr El-Sheikh governorate) and says that local leaders have done a great deal to help with the LF information campaign. The council organized many meetings with the people and showed them videos explaining the aim of the drug campaign and the importance of taking the tablets. Similar messages were given out in the mosques and youth clubs. "In this village, they are aware about this disease and its importance and complications," says Gamal. "All the people welcome the drugs and want to eliminate the disease."

The Ministry of Health and Population also works in close collaboration with other government ministries – for instance the ministries of education, information and religious affairs – and a high-level committee formulates and reviews social mobilization strategies from year to year. The Ministry of Agriculture has probably been the most important partner in the social mobilization programme because it has a network of extension centres in all the villages that parallel the primary health structures.

Dr Abdul Azim Tantawai, Under-Secretary at the Ministry of Agriculture, says that 10 000 extension workers throughout the governorates have received training in dealing with national campaigns such as MDA and can pass on information to farmers who will listen to them and trust



a key component of the successful Egyptian campaign.

them. "There is good cooperation between doctors and the agricultural staff in villages," says Dr Abdul.

The Ministry of Agriculture has a mobile film unit that tours the villages with a portable generator and folding screen to show information films to farmers – facilities that have also been used to explain the LF elimination campaign in rural areas. "I am sure that the national campaign over the next two years will bring the rate down even more and eliminate this disease," says Dr Abdul. "Egypt will become a model for other countries."

There is no doubt that effective social mobilization has unbeen the key component in the success of the Egyptian campaign so far, but the challenge is to keep the messages fresh and interesting and to maintain the enthusiasm and momentum from year to year. "This is very important," says Dr Maged. "This year, we told everyone that we have to have the highest coverage. Any problems must be reported to the imams, mayors or local leaders, but we won't accept any low coverage anywhere." Five years is a long time to keep a campaign of this sort going, and people could lose interest or become lax about taking the drugs. On the other hand, because MDA is only once a year and involves taking only a few tablets, this kind of problem can be overcome by a good social mobilization campaign. "Every year there is something

different," says Dr Maged, "and the people are good teachers for us."

Dr Maged and his team have received funding from WHO for a small project to produce a comic book about LF aimed at schoolchildren. Some 250 000 copies will be distributed to students in the year leading up to the fourth round of MDA. It is hoped that this will also prove an efficient way of getting the message into homes and of reminding people how important it is to maintain the momentum of the campaign throughout the five-year period.

The Ministry of Health and Population also provides certain incentives to people working in the elimination programme in an effort to maintain motivation for the remainder of the programme. Small monetary prizes will be awarded to the teams who achieve the highest coverage, and individuals will be given certificates signed by the Ministry of Health and Population and WHO to show that they have carried out their duties in ridding Egypt of LF. These awards recognize the contribution of medical staff, who work extremely hard to ensure that MDAs are successful each year.



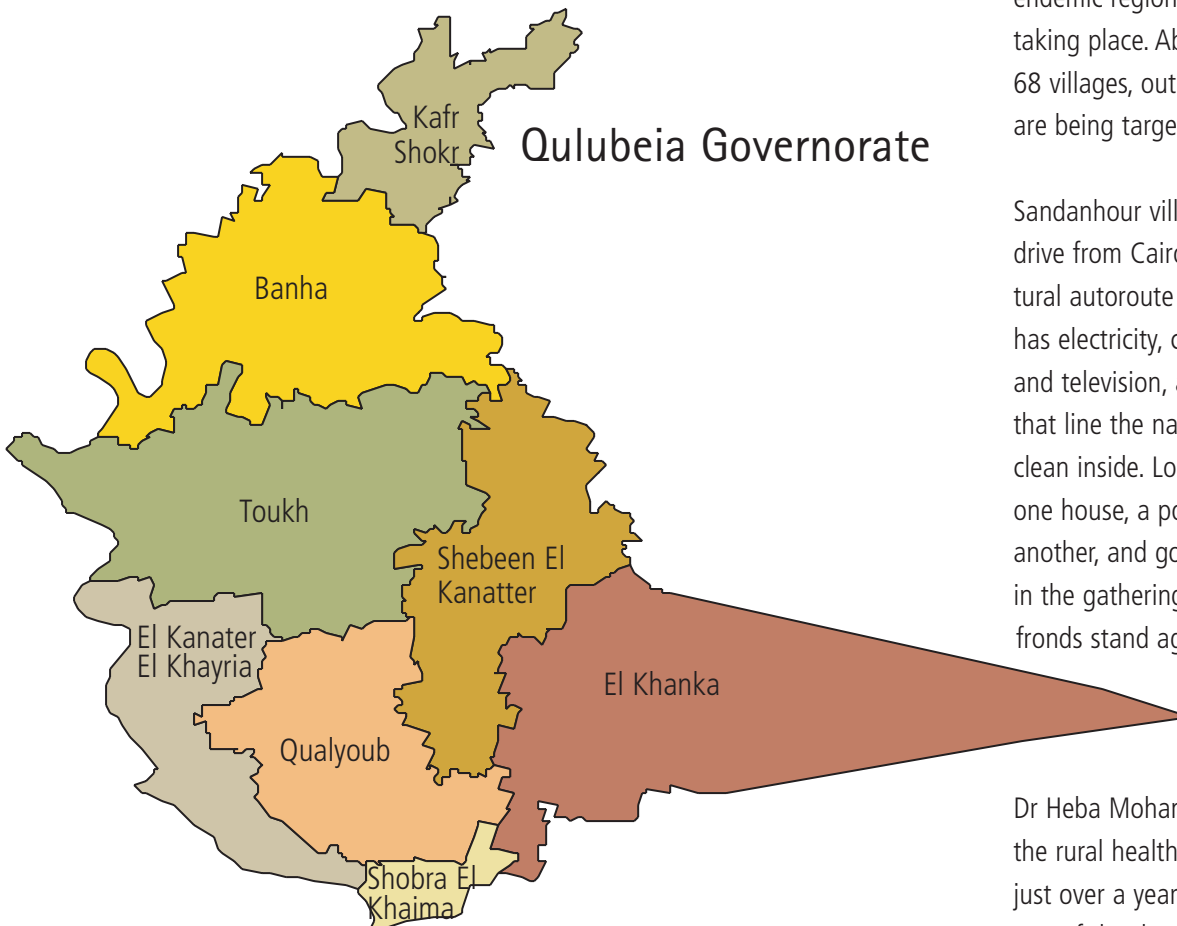


The 2002 MDA: experience in the field

Qulubeia Governorate is one of eight endemic regions where MDA has been taking place. About one million people in 68 villages, out of a total of four million, are being targeted.

Sandanhour village is about an hour's drive from Cairo along the busy agricultural autoroute that serves the delta. It has electricity, clean water, telephones and television, and the mud-brick houses that line the narrow alleys are neat and clean inside. Loud rap music wafts out of one house, a popular Egyptian song from another, and goats roam freely outside in the gathering dusk. Freshly cut palm fronds stand against a wall in preparation for an evening wedding celebration.

Dr Heba Mohamed Amin has worked in the rural health unit in Sandanhour for just over a year and has been involved in two of the three MDAs that have taken place there. She's a member of one of five





medical teams working in the village, distributing drugs to 15 000 people during the two-week period. The teams work long hours, going from house to house each evening after completing their normal daily duties in the clinic. By the second day of the campaign, about 2000 people have already been given the

drugs. Dr Heba says that her team has not encountered any resistance and that everyone is cooperating. "Some people from outside the target areas have also been asking for the drugs because they think it's a protection even if they are not at risk."

around the medical teams excitedly, usher us in and offer cups of sweet, dark tea while the tablets are distributed and names are ticked off the team's list.

Dr Heba graduated as a doctor in 1999 after studying medicine at Banha Medicine College for seven years. She eventually wants to return to Cairo to specialize in cardiology, but she loves her work in Sandanhour. "My hope in life was always to be a doctor. Ever since I was a child, from the age of three years, I have wanted to be a doctor." Such conviction might be surprising in such a young woman, but Dr Heba speaks from personal experience of a disabling disease. She walks with a pronounced limp, the result of childhood polio. "I must be sure that every person in this village takes these filaria drugs," she says. "It will ensure that we prevent this horrible disease from being endemic here."

Dr Heba is confident that the target can be reached within the given time. "We don't forget anyone," she says, "and we watch them take the drugs. They must swallow the drugs in front of us, so that we are sure they have been taken. We also need to make sure that there is no reaction such as vomiting."

Like all the health teams, Dr Heba's has received training from the Ministry of Health and Population in administering the drugs, dealing with any side-effects and explaining the benefits of the drugs to the population. "In our village," she says, "people are very happy to take the drugs and welcome us." People crowd





In one household, 26 people live together, spanning three generations. Everyone swallows the pills without complaint, from the toothless grandmother to six-year-old Mohammed – who pulls a face at the bitter DEC tablets but pronounces the albendazole “tasty, like sweets!” Asked whether he knows what the drugs are for, Mohammed says they are for filariasis and other parasitic infestations. He says he knows this because his aunt heard about it over the mosque loudspeaker and she told him to take the drugs and not to be frightened.



The people in this village have been informed about MDA by banners hung across the streets, posters on walls and leaflets distributed in advance of the campaign. They say they have seen the television spots and interviews with health officials and have attended talks and lectures on the importance of participating.

In another household, two sisters sit side by side on a sofa as they take the drugs. There are eight people in their household in all, they say, and they are happy to be taking the drugs. They have been waiting for the team to come to the house. One of the sisters is a teacher and says she knows that filariasis is a horrible disease – she doesn't want to get it. She has also been encouraging the schoolchildren in her class to take the drugs.

Sandanhour falls under the supervision of Dr Abd El Raouf Arafat, Under-Secretary of Health in Qulubeia governorate. He says this year's campaign is better than in the previous two years; past mistakes and shortcomings have been corrected. The number of teams in each village has been increased, with supporting staff coming from neighbouring villages to ensure that the work can be completed in time. The supervision of record-keeping has also been improved because it is essential to record accurately who has taken the drugs. "Some people in the first year took the drugs in their hands but we weren't sure whether they had swallowed them," he says. "Now we insist that the drugs should be swallowed in front of the medical staff."

There are many levels of supervision during the campaign, from the local health unit, to the district and governorate level, to

the Ministry of Health and Population teams. "We ensure that all the teams working in the areas are doing what they are supposed to do."

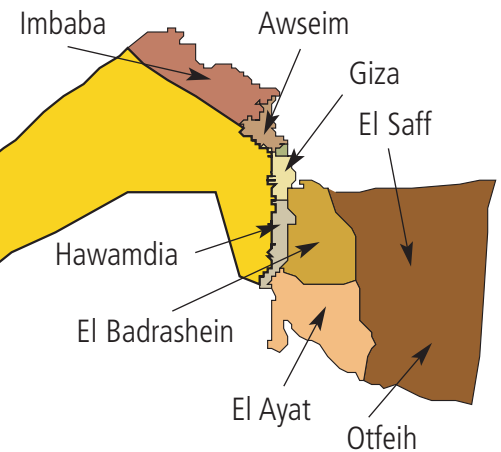




Day four

At 16:00 on the fourth day of the two-week campaign, a team from the Ministry of Health and Population Filariasis Control Department are visiting Giza governorate to check how things are going. They eat a late lunch of falafel and sandwiches while waiting at a level-crossing for a long, crowded passenger train to pass. They've already done a full day's paperwork in the office, and it will be very late before the evening's work is complete. Most of the drug administration work takes place in the evenings – when most people will be at home – so the entire team works long, hard hours throughout the campaign.

Giza, of course, is famous for the pyramids, but the sprawling metropolis of Cairo creeps ever closer, so that districts such as Badrashin are almost suburbs of the city now. About 240 000 people are at risk of LF in the governorate and, in this district, four villages are being targeted by MDA.



Giza Governorate

The village of Meet Rahina has a population of about 25 000, divided between six medical teams covering approximately 4000 people each during the two-week



campaign. The formula is the same here as it is throughout the country – each team consists of a doctor, a nurse and a clerk to record of who has taken the drugs and who is missing. Sammy, the records clerk, says that the campaign is going very well here and that 5500 people have already received the drugs in the village as a whole.

A young mother called Naglaa, carrying a toddler in her arms, says that she heard about the campaign on television, and that in the mosque they were told about the need to take the drugs. Her three-year-old son had also taken the tablets. When asked whether they had experienced any side-effects, Naglaa says “No, we are as strong as iron and nothing happens to us!”

Dr Samir Mahfouz is Director of Leishmaniasis at the Ministry of Health and Population unit controlling malaria, filariasis and leishmaniasis, but during MDA the entire team works together on the campaign. In some parts of this area, he says, 99% of the eligible population were reached in previous years. “We are proud of that because I remember a time when this place had a prevalence of 19%. Two years ago it was 6%, and now with the combined therapy MDA, the prevalence rates have fallen even further.”

Although it is still early days, Dr Samir thinks the third round of the campaign is going well, but adds, “We can only tell by going out into the field and finding out for ourselves. In the field, you find the pulse of the people and how they are reacting and this is the main criterion that

determines whether the campaign is going well or lagging behind. In the places I have visited so far, it has been going well, but it won’t just go well by itself. We have to push it the right way always and try to maintain the momentum and stamina we have seen so far.”

Dr Samir's main fear is that, as the years go by, people will think that success is guaranteed and will become a little lax about taking the drugs, or that the medical teams may relax the regulations on keeping accurate records and following up people who have been missed in the MDA. “They are confident of success, but we need to stick to the regulations so that we can be sure of the continuous progress of the campaign.”

Living with filariasis



Saleh has advanced and complicated LF and has suffered from elephantiasis of his legs for about eight years. The first symptom was his legs feeling hot. After that, his legs began to swell and blister. Every year, the inflammation recurs and gets worse. The doctors didn't know how to treat his condition, and some thought it was a deep vein thrombosis until it was finally diagnosed as elephantiasis.

The inflammation comes and goes in one leg, but the other gives him constant pain and a burning sensation. It becomes inflamed every two or three months, and he uses an antibiotic cream to help it dry up. He gets fungal infections in his toes which he treats with mercurochrome.



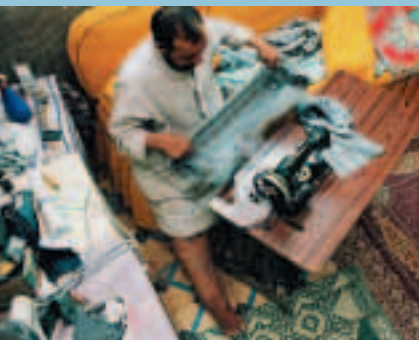
Saleh used to work as a taxi driver, but after he got the disease he could no longer drive and so he ran a small grocery stall. Now he cannot stand for a long time, so he's finding that difficult too. "It has really affected my life," he says. "It has totally affected me economically. The drugs I need are expensive, and sometimes I need to be hospitalized and that drains me financially too."

He says his disease has also affected his family and friends emotionally, although they are no longer frightened that they will get it too. Sometimes, Saleh says, his



painful, swollen legs put him in a very bad mood and he spends much of his day just sleeping. "I feel hurt inside," he says. Saleh is encouraging other people to take the drugs because this will prevent them from getting this horrible disease. About his own plight, he is rather more phlegmatic. "Everything is God's will," he says. "I hope that one day there will be a cure. Inshallah."

The bright yellow cushions that covering the seats in the house of 42 year-old **Abdul-Hakim Mohamed Ibrahim's**, together with the old sewing machine standing in the corner of the room, hint at his past life as a textile merchant. When Abdul-Hakim's swollen leg meant that



he couldn't walk long distances or stand for any length of time, he became a taxi driver. Soon, however, he couldn't do that either. Now he helps a bit in the mosque and in his brother-in-law's tile factory, but he can't really do much work. He earns only EGP 150 per month (less

than US\$ 30), plus a little from the mosque and from his family, and this is what he, his wife and seven children live on.

"Thirty five years ago, when I was a child," says Abdul-Hakim, "I walked a long distance and drank a lot of water and the water went to my legs." Abdul seems to want to explain his condition, which is a clear case of elephantiasis. Every three to five months he gets inflammation for a month or so. The last attack lasted three months. The leg swells bit by bit, stretching the skin, which then cracks and becomes infected. This causes more inflammation and the swelling increases each time. He can't use his sewing machine much any more because he needs to sit with his leg up. He can only manage a short stint at the machine each time.



Halfway there

It's 23:00, but the streets of Al Korain are still busy. The clamour of children playing and the clatter of a donkey carrying an old man compete with the melodic recitations of the Holy Koran.

The two-week drug administration is almost halfway through. Taking a brief break from his rounds to fortify himself with strong coffee, Dr Abdul Karim, the local director of health, says that the MDA is going well and is even ahead of target, with 50% of the target population of 62 000 having received their drugs. "This year," he says, "the teams are more vigorous and the people are more willing to take the treatment. And the rate of acceptance of treatment is higher than last year."

The two-week MDA is the culmination of months of preparatory work throughout Egypt. In Al Korain, there have been many talks and lectures to inform people about the campaign, with particular attention being paid to getting the message to young people and persuading them to take the campaign seriously.

The Ministry of Health and Population has been especially concerned to scotch any rumours that could damage the campaign's effectiveness. Stories about the drugs being harmful or useless, or causing sterility, could seriously undermine the elimination efforts. "That's why we emphasize these things during the training so that people can respond accordingly and react vigorously against the rumours," says Dr Abdul. "It's especially important that the medical

teams are trained to reassure people that the side-effects are a sign that the drugs are working against the microfilariae."

Many clinical cases of elephantiasis can be found in Al Korain. Dr Abdul hopes that one day a rehabilitation centre will



be built to provide the emotional and physical support that patients need and to show them how to manage their condition through good hygiene, use of antibiotic creams to prevent infections, and rest and exercise (methods that have proved very effective in pioneering work carried out in Brazil in recent years). The centre could also try to rehabilitate and train patients to do other jobs to earn a living.

“The psychological effects are also very important,” Dr Abdul adds. “These people are like beaten people... they are beaten up by the disease. They feel it a great deal, although they may not show it. Often they can’t earn anything and need help.”





Pills and profiteroles

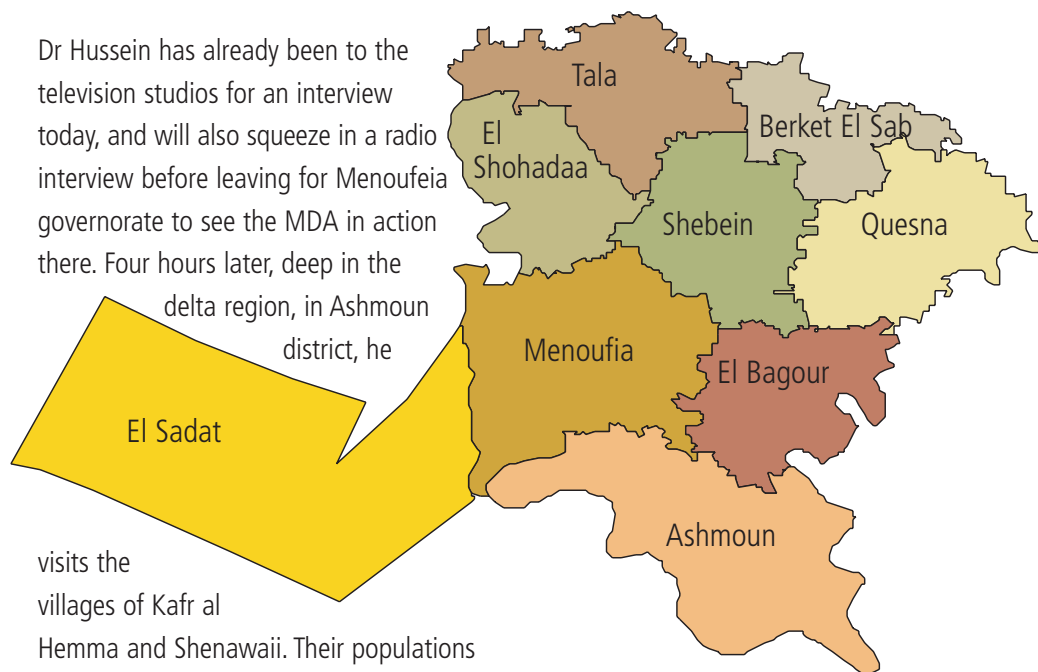
“**E**at!” says Dr Hussein Kamal, Director of the Malaria, Filariasis and Leishmaniasis Control Department at the Ministry of Health and Population, opening a large cardboard box and producing profiteroles covered in gooey chocolate sauce for everyone. His small office is constantly full of people arriving with the latest figures to be collated on the progress of MDA in the governorates. He says, “This is our lunch and then we go!”

It’s a high-calorie, high-octane fortnight for the control team. They work 14-hour days and 7-day weeks, and snatch what meals they can when they can – usually fast food on the long road journey to and from the governorate they are visiting that day. Between them, they cover thousands of kilometres during the course of the campaign.

Dr Hussein has already been to the television studios for an interview today, and will also squeeze in a radio interview before leaving for Menoufeia governorate to see the MDA in action there. Four hours later, deep in the delta region, in Ashmoun district, he

visits the villages of Kafr al Hemma and Shenawaii. Their populations – of 10 000 and 8500, respectively – are all at risk from LF and need to receive drugs. Most of the people here are farmers growing corn, wheat and vegetables.

Menoufeia Governorate



Dr Magdi Erian, the rural health unit doctor responsible for the two villages, says MDA has been going very well this year. “We have almost finished our work,” he says. “This year, people know what we are doing and the MDA is



going faster than before. Now they understand why these drugs are being given out, and how the disease is transmitted. They know that the whole population should have the drugs because if someone is missed out, they could be the cause of future infections.”

Some 7% of Shenawaii’s population had a high microfilaraemia rate a few years earlier, but that has now fallen to below 3% and Dr Magdi is confident that the disease will soon be eliminated here. He says it has got easier with each passing year to implement MDA. “The first year, people were asking why do we need to take this drug, and why do we all need to take it, not just those who are infected? But now they understand that everybody has to have the drug.”

Dr Magdi has plenty of local clinical cases on his hands, and these provide the most

powerful incentive for people to take the pills he says. He has one patient whose condition is so horrific that even the LF control team members, who are used to dealing with acute cases on a daily basis, are shocked.

Om Kalthoum Abdul Fuddeel is an attractive forty-year-old woman, but her face is deathly pale and her eyes haunted with pain. She has had elephantiasis of her left leg for the past fifteen years. It is now unrecognizable, swollen to gargantuan proportions. The cauliflower-like skin is covered in sores and flies. For the past two years Om Kalthoum has been unable to move and sits on the hard floor day and night, unable even to sleep properly. It is a shocking and distressing sight.

Dr Magdi says that Om Kalthoum’s leg alone weighs at least 60 kg – more than the rest of her body. The swelling and acute attacks are a vicious circle, and regular treatment has been having no effect. “The leg is getting bigger and we don’t know why,” he says. “We don’t know how to help her.”

Whimpering with pain, Om Kalthoum says that she cannot move at all. Her back hurts a lot, but the worst thing about her condition, she says, is that her husband divorced her and took away her four children. Now she relies totally on her elderly mother and sisters to provide for her every need. “At first, her family was terrified of catching the disease as well,” says Dr Magdi, “but we explained that this cannot be transmitted directly and that the worms that caused this leg to swell will have died, and now they understand.”



Om Kalthoum has been looked after by her sister (above) since her husband divorced her.

Om Kalthoum has been begging doctors to amputate her leg, but the surgeons say that, since most of her body's fluid is in the leg, the operation would probably cause heart failure and kill her. "This is not living," she says, "I want to die."

"It's distressing and it's killing her psychologically as a woman, as a wife, as a mother – it's killing her," says Dr Magdi. "But we, as doctors and human beings, can do little for her. This is not living. This is a killing disease. The disease itself doesn't kill, but it's a killing system. It's terribly sad."



The team from the Ministry of Health and Population record Om Kalthoum's details and on the long journey back to Cairo discuss what, if anything, can be done to help. Should Om Kalthoum be hospitalized in Cairo, or could she be made more comfortable and given better treatment at home? A special report will be written on her circumstances and given to the Minister of Health and Population first thing in the morning, even though it means staying up half the night to write it. "If it was not for the mass drug administration," says Dr Samir, "Om Kalthoum's case might not have come to our attention at all. By going from house to house, we are discovering all sorts of clinical cases that we didn't know about before. And if this mass drug administration prevents only one more case of this horrible disease, then everyone's efforts will have all been worthwhile."

Despite the long hours worked during the campaign, Dr Samir and the rest of the LF control team draw great satisfaction from their work. "I'm able to see the effect of my work," says Dr Samir. "I see the prevalence rates of LF going down substantially and I get a lot of satisfaction and pride from that. This type of wide-scale improvement isn't easy to find in any other branch of medicine. That's what I get satisfaction from."

It's well past midnight by the time the team finally reaches Cairo. The city streets are still teeming with shoppers and clogged with traffic, but in the minibus there is silence – except for the gentle snoring of the exhausted LF control team members.



Monitoring and evaluation

Monitoring and evaluation of both the implementation of the annual campaigns and their effects on infection rates are crucial for determining the effectiveness of MDA from year to year and for deciding whether, ultimately, the MDA has succeeded in eliminating LF. Once the disease has been eliminated, monitoring will still be essential to ensure that it does not return.

In the coming year, researchers at Ain Shams University in Cairo, working in collaboration with WHO and colleagues from Washington and Emory universities and the Liverpool School, will monitor the reduction in incidence of microfilariae in areas that have been covered by three rounds of MDA. Some sentinel sites have been selected for review, and initial results show that, even after two years of





MDA, the prevalence of LF has declined quite dramatically in some areas. Dr Zuhair Hallaj says that the initial findings are “very, very promising”.

As the elimination campaign moves into its final phases, monitoring and evaluation will become increasingly important.

- Epidemiologists will need to find a sampling technique that will identify potential pockets of continuing infection or verify that the disease has been eliminated.
- Testing of the population will have to continue for some years to ensure that there is no reinfection.

- Children born after the disease is assumed to have been eliminated will need to be monitored to make sure that they are not acquiring the infection.
- The analytical tools to do this job will now need to be defined more effectively.

Monitoring and evaluation will be needed not only to follow up the epidemiology of the disease and the effectiveness of MDA but also to document any problems that may have arisen and to indicate what further improvements are possible.

The campaign in Egypt is being carefully documented by WHO for future reference, so that other countries can study what has worked, how it worked, what the pitfalls were and how they were overcome. WHO is also collating experiences of training sessions and manuals, and the charts and records kept from year to year. A film has been made of the second and third campaigns and this account is also part of the process.

“I hope WHO will go on documenting the whole process so that everyone will have the benefit,” says Dr Hallaj. He is optimistic that Egypt will succeed in eliminating LF and that “this will be a case study for the whole world to follow”.





Conclusion

Egypt's lymphatic filariasis elimination campaign has been a Herculean undertaking, with an impressive degree of commitment at every level from the Ministry of Health and Population down to individuals in the villages.

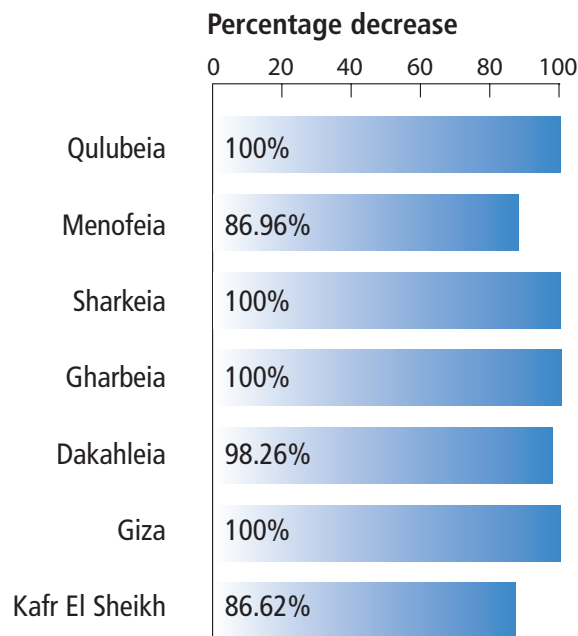
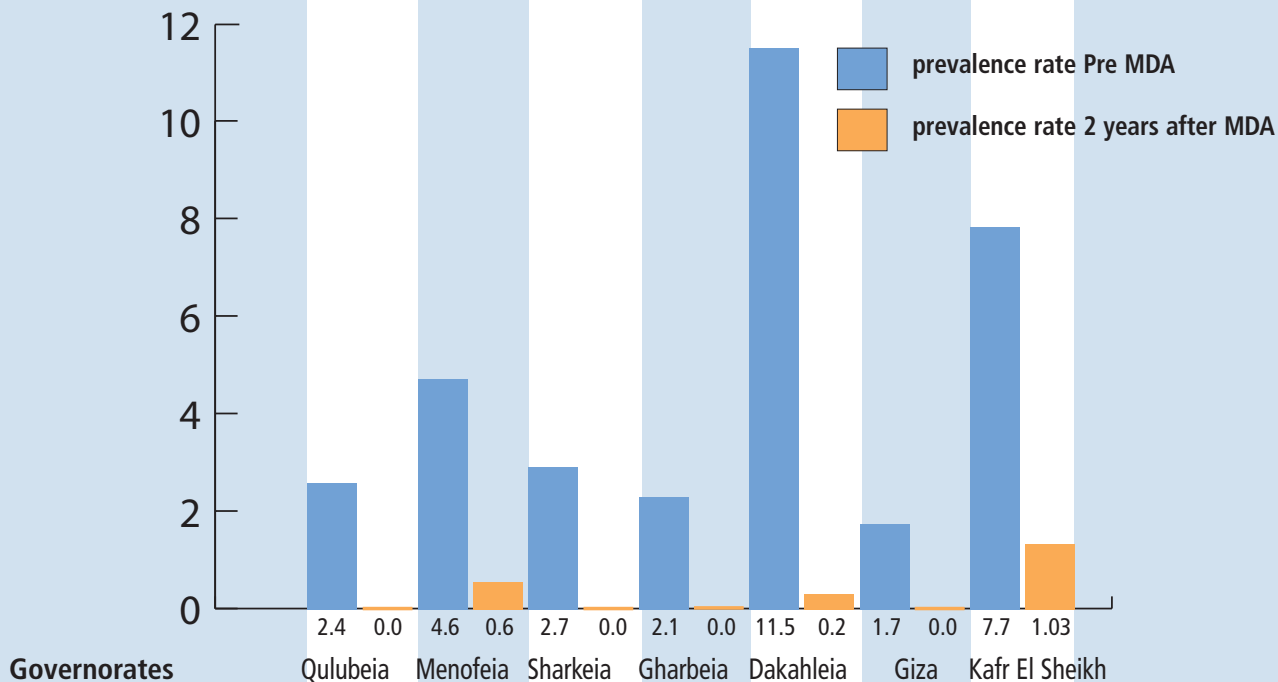
During the two weeks of the 2002 MDA, drugs were distributed to 2 469 555 people out of a potential total of 2 549 160: that's 96.88% of the eligible population in endemic areas. The medical teams aimed to mop up the missing 3%. Some 2.5 million albendazole tablets and nearly 13 million DEC tablets were distributed.

No campaign of this size can be entirely free of problems or shortcomings – but these have always been acknowledged and addressed. The programme has built up a momentum of its own over the past three years. The biggest challenge for the

remaining two or three years will be to keep that momentum going, both among health care staff and especially in the social mobilization campaign.

"We are halfway there," says Dr Hallaj. "We are leading the world in this. It is very important for the Egyptians to know that Egyptian peasants are leading the world in this. It gives them a certain pride and they like to have that pride. It gives them great joy – just imagine, the Egyptians are leading the world in proving that they can get rid of LF, this very disabling disease!"

The hope is that this unique public–private and national–global partnership will act as a model for other countries to adopt, and perhaps also for campaigns to control other diseases. It deserves to succeed!



The impact of MDA on microfilariasis prevalence

In 2002, the National Programme carried out night blood surveys in August before the third cycle of MDA in the sentinel sites which had the highest pre-MDA prevalence rates.

The results are remarkable. After only two cycles of annual MDAs, the prevalence rates in the sentinel sites have gone down dramatically, proof that the elimination strategy is effective. National governments in endemic countries, with support from the Global Alliance, can meet the challenge of the 2020 elimination targets with confidence and renewed vigour.



Map of Africa





ABBREVIATIONS

DEC – Diethylcarbamazine

EMRO – Eastern Mediterranean Regional Office of WHO. Based in Cairo. Covers Egypt, Sudan and Yemen.

LF – Lymphatic Filariasis

MDA – Mass Drug Administration

WHO – World Health Organization