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DRACUNCULIASIS IN AFRICA

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FINAL REPORT ON A WORKSHOP
ACCRA, GHANA, 14-18 MARCH 1988



WORLD HEALTH ORGANIZATION
Regional Office for Africa
Brazzaville

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C O R R I G E N D U M

<u>Page</u>	<u>Paragraph</u>	<u>Line No.</u>	<u>Should read</u>
2	7	6 and 7	Annexes 10 and 11 instead of Annexes 9 and 10
8	25	10 12	Annex 3 Annex 4 instead of Appendix F instead of Appendix G
	26	6	Annex 7 instead of Appendix H
56	ANNEX 7(A)		Title should read "GUINEA-WORM ERADICATION PROGRAMME IN INDIA By Dr P.N. Sehgal Former Director National Institute of Communicable Diseases New Delhi.

ACKNOWLEDGEMENT

We wish to acknowledge our gratitude to the Government and people of Ghana for accepting to host the workshop and for providing such unforgettable hospitality to the participants. Our thanks also go to the following sponsors of the workshop:

GLOBAL 2000 INC
WASH PROJECT
USAID
UNICEF, NIGERIA
CDC, ATLANTA
PEACE CORPS, BENIN

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CONFERENCE OBJECTIVES

The overall objectives of the conference were:

- (1) To assess the progress made in the implementation of the recommendations from the First Regional Workshop, held in Niamey, Niger, 1-4 July 1986.
- (2) To review the current status of dracunculiasis with particular reference to its occurrence, distribution, surveillance, control, and socioeconomic impact.
- (3) To review the current status of projects for the control or elimination of dracunculiasis as part of primary health care and water and sanitation projects.
- (4) To facilitate the formulation and development or the strengthening of national plans of action in all endemic African countries.
- (5) To help mobilize public and international support for anti-dracunculiasis projects by publicizing the extent and deleterious effects of the disease and opportunities for its elimination.

INTRODUCTION

1. This report of the Second Regional Workshop on Dracunculiasis in Africa summarizes a conference which was a major milestone in the struggle against guinea worm disease. It was symbolically fitting that the next to last day of the meeting was St. Patrick's Day (March 17), named for the patron saint whom tradition says drove the snakes out of Ireland. We can imagine him encouraging us to do the same to the guinea worms in Africa.

2. Chief among the several highlights of this workshop was the attendance at the opening session of former United States President and Mrs Jimmy Carter, and the WHO Regional Director for Africa, Dr Gottlieb L. Monekosso. That those prominent, busy people took the time to travel to Accra to attend this meeting provided a powerful legitimacy to the eradication effort, building on the endorsement by the steering committee for the International Drinking Water Supply and Sanitation Decade (IDWSSD) in 1981 and 1987, the World Health Assembly resolution in 1986, and the Hearing on dracunculiasis held by the United States House of Representative's Select Committee on Hunger on the previous St. Patrick's Day in 1987. The attendance and attention afforded to the meeting both benefited greatly by their presence.

3. During this meeting, President Carter also co-signed an agreement on behalf of Global 2000 Inc. with the Secretary of Health of Ghana and the head of the Bank of Credit and Commerce International (BCCI) in Ghana, to officially commit support for Ghana's national Guinea Worm Eradication Programme. The host country for the workshop thus became one of three key endemic countries being assisted in their eradication efforts by Global 2000 and the BCCI (the others are Pakistan and Nigeria). The United Nations Development Programme (UNDP) and the WHO Regional Office for Africa announced during the workshop that they were each reserving US \$50 000 for use in guinea worm eradication in the African Region this year. The United Nations Children's Fund (UNICEF) mission to Ghana also announced that they would make a similar amount available to the eradication programme in Ghana.

4. Such evidence of financial support for endemic countries was manifest at the first regional meeting, which met at Niamey, Niger in July 1986. This second conference had representatives from 17 endemic African countries (vs 14 for the Niamey meeting), plus India and Pakistan, and twice as many participants (over 199). Other differences were the palpable increase in enthusiasm and the sense of momentum, and perceived feasibility of the goal of eradication.

5. Highly significant results of a study of the impact of guinea worm incapacitation on agricultural productivity in Nigeria were presented by a representative of UNICEF's Nigerian office, which funded the important study. That study, which was conducted in a fertile rice-growing area of about 1.6 million persons in southeastern Nigeria, documented enormous annual losses in rice production due to guinea worm's adverse effects on large numbers of farmers at critical times in the agricultural season. Some beginning documentation of direct adverse effects on maternal and child health was also presented. No less exciting were the revelations that dracunculiasis apparently has been eliminated already from the Gambia and Guinea. Yet another highlight was the premiere showing of the new movie about the disease and its prevention. "The Fiery Serpent".

6. For all the evidence of progress, however, we still have a long way to go before this disease is eradicated. Several endemic countries still need to determine the extent and location of guinea worm in their jurisdictions. Others still need to begin or intensify their eradication programme. Bilateral and international development agencies need to lend far more support and priority to eradication efforts - eradication of dracunculiasis is an official subgoal of the water decade - in the last quarter of the IDWSSD than they have in the first three quarters. Even a month's delay can mean another year of unnecessary suffering for some affected communities. Thus a sense of urgency is incumbent on everyone, not only because of the fast approaching end of the IDWSSD, but also because people are suffering, and we have the means to help them.

OPENING CEREMONIES AND PRESENTATIONS

7. The Second Regional Workshop on Guinea Worm in Africa was convened on Monday, March 14, 1988. Opening addresses were made by the Secretary for Health, Air Commodore (ret.) F. W. K. Klutse; President Jimmy Carter; Professor G. L. Monekosso and Provisional National Defense Council member Mr Justice D. F. Annan. (The full text of President Carter's address and the summary of Professor Monekosso's address are presented in Annexes 9 and 10).

8. After the opening addresses, a group photo and a coffee break, the conference reconvened to elect a chairman and adopt the proposed programme. The next morning was taken up with a presentation of the CDC-produced film on guinea worm. "The Fiery Serpent", which was filmed in Anambra State, Nigeria, and an address by Dr Donald Hopkins, Senior Consultant for Global 2000, on the status of guinea worm control and eradication programmes. (Dr Hopkins' address is presented in Annex 8).

PRESENTATIONS

Indian and Pakistan Guinea Worm Eradication Programme and International Drinking Water Supply and Sanitation Decade

9. The conference reconvened in the late afternoon with presentations by Dr P. N. Sehgal, former Director of the Indian National Institute of Communicable Diseases, Delhi, on the Indian Guinea Worm Eradication Programme; Dr Peter Bourne of Global Water on the International Drinking Water Supply and Sanitation Decade (IDWSSD); and Dr Mohammed Abdur Rab, Principal Scientific Officer for the Pakistan National Institute of Health, Islamabad, on the Pakistan Guinea Worm Eradication Programme.

10. India is one of the first countries to undertake a guinea worm eradication programme. The programme was launched in 1983 under the auspices of the National Institute of Communicable Diseases in Delhi. The disease is endemic in six states comprising 7102 villages using tanks, ponds, or stepwells. The eradication strategy consisted of bi-annual case-search operations, conversion of existing sources to safe sources, chemical treatment (with temephos), and health education. India expects to completely eradicate the disease by 1990.

11. In Pakistan, with the help of Global 2000, the National Institute of Health, and Bank of Credit and Commerce International (BCCI) Foundation, the guinea worm eradication programme began in November 1986. Since then, the project has assessed and confirmed prevalence of the disease, established its reporting and administrative systems, assessed people's behaviour, and developed educational materials, training, and two demonstration projects. Different approaches have been tested for different areas and different materials developed for each of the at-risk groups. The programme developed a management and reporting system reaching into the villages. The project is developing training programmes of frontline village implementors in case identification, reporting, water filter distribution, health education, and chemical treatment of water.

12. The goal of the programme is to halt disease transmission in 1988, given its limited endemicity, low prevalence, and low transmission.

13. After discussion of the addresses, the session ended with a brief presentation by Dr Kofi Ahmed on the purpose of the workshops and how they relate to the conference as a whole. The participants were then assigned to their respective working groups. At noon after reviewing the registration forms and realizing that over 100 participants would be staying for the entire conference, the conference coordinators decided to add a fifth working group. The groups were organized by language preference. Few people chose bilingual groups, hence two French-speaking and three English-speaking working groups were set up. Bill Brieger of the University of Ibadan agreed to be facilitated for the third English-speaking group.

COUNTRY REPORTS

14. Tuesday morning the conference reconvened at 8.30 for country presentations. Sixteen of the 17 African countries present at the conference made brief presentations on the status of their national programmes. The full texts of the country reports are available to contacting the WASH Project).

Workshop 1

15. The first workshop of the conference occurred on Tuesday afternoon. Each subgroup was asked to brainstorm a list of all the problems they encountered in planning and implementing guinea worm control and eradication programmes; to review the list and choose the six problems that were most important to them; and to list those six in order of importance. After a brief coffee break, the working groups reconvened and each subgroup presented its lists of problems. Most lists were very similar and the groups were able to agree on a common list of the six major problems they wanted to analyse and solve during the remainder of the workshop sessions. The French-speaking groups required more time to finish these tasks because of the greater difficulty in agreeing on the proper wording for the problem statements. The participants valued the exercise and were pleased to see that all the working groups had come up with similar lists of problems. The six problems agreed upon were:

- (i) lack of resources;
- (ii) lack of data;
- (iii) lack of commitment and sustainability;

- (iv) lack of awareness of the socioeconomic consequences of the disease at all levels;
- (v) lack of intersectoral coordination;
- (vi) lack of community involvement and education.

16. At the conclusion of the first workshop, the participants re-assembled to see the UNDP/USAID film, "The Waters of Ayole," on the Togo Rural Water Supply Programme. It was well received and generated a good deal of discussion. The Ghana Ministry of Health was host at a reception on Tuesday evening after the film.

Technical presentations

17. Wednesday morning's session was devoted to the following technical presentations and discussions:

(i) Agricultural impact

Mr Carel de Rooy, UNICEF, Lagos
Dr Dennis Long, USAID, Washington

(ii) Cost benefit ratios of interventions

Dr John Paul, Research Triangle Institute
North Carolina

(iii) Effective surveillance

Dr Karl Kappus, CDC, Atlanta

(iv) Effects on maternal and child health

Dr May Yacoob, WASH Project
Dr William Brieger, University of Ibadan
Dr Susan Watts, Rhode Island College

18. According to the first plenary presentations and discussions by Dr Long and Mr de Rooy, research has documented the impact of dracunculiasis on agricultural production. A UNICEF-sponsored study in Nigeria focused on the relationship between guinea worm prevalence and rice production. It was undertaken in nine Local Government Areas (LGAs) and surveyed 723 people in 87 households. These data were then extrapolated to 195 000 households (1.6 million people). It was

established that, at a cost of US \$35.2 million, four different intervention strategies could be used simultaneously to eradicate guinea worm in seven LGAs over a period of five years. The proposed strategies include improved water supply, health education and distribution of nylon monofilament filters, chemical treatment of ponds, and community education and mobilization which would also include sanitation. The economic benefits from such an approach would result in an estimated US \$20 million per annum in additional rice sales alone. The USAID-sponsored Vector Biology Control Project (VBC), in collaboration with CDC, will also carry out a similar agricultural impact study in Nigeria over a two-year period.

19. Dr Guiguemde discussed how epidemiological studies are furthering understanding of disease transmission. He and his team in Burkina Faso were able to identify a total of 17 species and six genera of "cyclops" responsible for transmission in one province. (For more details, see Annual Parasitologie Human Comparatif 1987, No. 5, pp. 484-491). Similar studies are being conducted by the French Research Institute (ORSTOM) in Benin.

20. Another study by Dr Guiguemde's team showed dracunculiasis control through health education in three hyperendemic villages which were organized within the framework of primary health care. Slides and films were shown as part of the village programme. The preventive means consist of community efforts and individual efforts. Each village was organized, and a village health agent was chosen by the community and trained. He was assisted by a committee of seven men and seven women also selected by the community. The focus of the training was village prevention and the distribution of filters. Two years into the programme, the disease was eradicated. (For more details, see Bulletin de la Société de Pathologie Exotique, 1987, pp. 390-395).

21. Dr John Paul, Research Triangle Institute, presented a 1987 field test of a microcomputer-based implementation planning and cost-benefit model, developed by WASH in 1986. The field test, conducted through the Pakistan Guinea Worm Eradication Programme, indicated the modelling process could be applied to planning guinea worm control programmes. (The full study, WASH Field Report No. 231, A Field Test Report of Implementation Planning and a Cost-Benefit Model for Guinea Worm Eradication in Pakistan, is available from WASH).

22. Dr Karl Kappus presented his paper, Effective Surveillance to Eliminate Dracunculiasis: New Tasks for Old Tools, which emphasized the importance of effective surveillance in the elimination of guinea worm disease because it mobilizes political support, defines the location and extent of guinea worm disease, is critical for controlling the disease and evaluating the impact of intervention, and confirms eradication. He recommended that four principles of guinea worm disease surveillance be included in design: (i) activities should always have the objective of supporting the eradication effort; (ii) information must be available to those who need it in time to guide decisions; (iii) activities must be designed according to the specific situation; and (iv) activities should always include independent monitoring. He discussed four phases of the programme: (i) collection and use of available information; (ii) identification of affected areas and the extent of guinea worm disease; (iii) direction of intervention efforts, and (iv) confirmation of the elimination of guinea worm disease. He stressed that surveillance activities should be designed according to the extent of endemic guinea worm disease and the phase of the elimination programme. Good design incorporates active procedures to overcome obstacles (e.g. geographic and temporal focus, immobilization of infected persons) that cause routine passive reporting to identify only a small percentage of cases. Good design also includes monitoring to validate results at every stage.

23. May Yacoob, Susan Watts and William Brieger made a presentation entitled "Guinea Worm: What Happens to Mothers and their Children?" It was based on a WASH study, conducted in Nigeria, focused on how the disease affects women and their ability to care for their children. The study findings have serious implications for child survival and development. Forty-two women were surveyed. Their experiences were developed into case studies which showed trends and patterns in four major variables: self care, child care, domestic activities, and economic activities. The results of the study showed that over 50 percent of the women were bedridden for an average of nine weeks. They tended to curtail their nutritional intake and to suffer acute self neglect. Their children, while cared for by available kin, were not receiving adequate nourishment. Over 20 percent of the sampled women defaulted on child immunization as a direct consequence of their incapacitation. Malarial fevers in children went untreated or were treated with local and/or unprescribed drugs. Infections and ulcers went untreated. The average loss of income was US \$70 (in an area where annual per capita income is US \$125). The study illustrated some of the major consequences of disability on the woman, her family, and the community. (The full study, WASH Field Report No. 232, Maternal Morbidity from Guinea Worm in Nigeria and Its Impact on Child Survival, is available from WASH).

Workshop II

24. On Wednesday afternoon, the workshop participants in their five working groups analysed the six problems they had identified the previous day. The facilitators discussed the proposed method for analysing problems and asked each subgroup to analyse two of the six problems. Most of the subgroups were so enthusiastic about the method that they asked to take more time to do the task so they could go into greater detail in analysing the problems. The working groups also chose to spend more time discussing the subgroup analyses of the problems so that everyone could participate directly. One group worked until 8.00 p.m., discussing the problem analyses, and broke up only after repeated requests from the Conference Coordinator.

DONORS' PANEL AND COUNTRY RESOURCES

25. On Thursday morning, a panel of various donor representatives was convened to talk about the financial and technical resources available to combat dracunculiasis. United Nations Development Programme (UNDP) and WHO Representatives were each authorized to announce grants of \$50 000 to eradication efforts on the continent. Other representatives of bilateral and multilateral donor agencies explained how to access their funds. Participants from the various technical assistance agencies present at the conference explained how the endemic countries could access their services. (A synopsis of the donors' panel presentation appears in Appendix F). Most participants filled out resource questionnaires describing the kinds of help they could provide. (A copy of the questionnaire and a summary of responses are attached as Appendix G).

Workshop III

26. After the morning break, the working groups reconvened to solve their six problems. Each subgroup worked on one problem before lunch and another one after lunch. The total group reviewed and contributed solutions to each of the problems after they were presented by the subgroup. (A synopsis of the five groups' recommendations is attached as Appendix H. The recommended solutions to each of the five groups' lists of problems and their analyses of the problems are available from WASH). Several participants from each working group assisted their facilitator in preparing the working group's presentation to the entire conference. At the same time, a small group of conference participants worked on the proposed conference recommendations.

COUNTRY ACTION PLANS

27. The delegates from each of the participating countries met in country teams. They reviewed what they had learned from the conference and developed action plans incorporating these ideas into their national strategies for controlling guinea worm. Some country teams used this opportunity to start adapting their national action plans. These action plans are also available through WASH.

Closing session

28. The conference concluded with reports from the five working groups recommending solutions to the problems encountered in planning and implementing dracunculiasis control projects and a discussion of the conference recommendations. After considerable discussion, the following set of formal conference recommendations were accepted by the delegates.

RECOMMENDATIONS

General

29. A Third Regional Conference on guinea worm in Africa should be held in two years' time in a French-speaking country. WHO/AFRO should identify a suitable venue in sufficient time to make all financial and logistical arrangements. The format of the conference should be designed by WHO/AFRO to meet the programme development needs of the conference participants and to incorporate an appropriate balance of plenary presentations and discussions and small group discussions to involve all participants.

30. Participation: The conference should include professionals involved at all levels from policy makers to local programme and implementation people. These participants should include community workers in health education and water supply and sanitation as well as epidemiologists and researchers. Every effort should be made to ensure the participation of the "unsung heroes" of the guinea worm campaign.

31. Role of IDWSSD: Since the steering committee of the International Drinking Water Supply and Sanitation Decade reaffirmed at its 1987 session, its endorsement of dracunculiasis eradication as a subgoal for the Decade, WHO should coordinate the requests of individual countries for financial, material, and logistical assistance to various donor agencies who wish to help eradicate guinea worm disease.

32. Mass media: The Second Regional Conference encourages the maximum use of the mass media at national and international levels to publicize the human suffering caused by dracunculiasis as well as breakthroughs in the campaign to stimulate political awareness and financial commitment to eradication campaigns.

National

33. National conferences: Each endemic country should hold a national conference on dracunculiasis to:

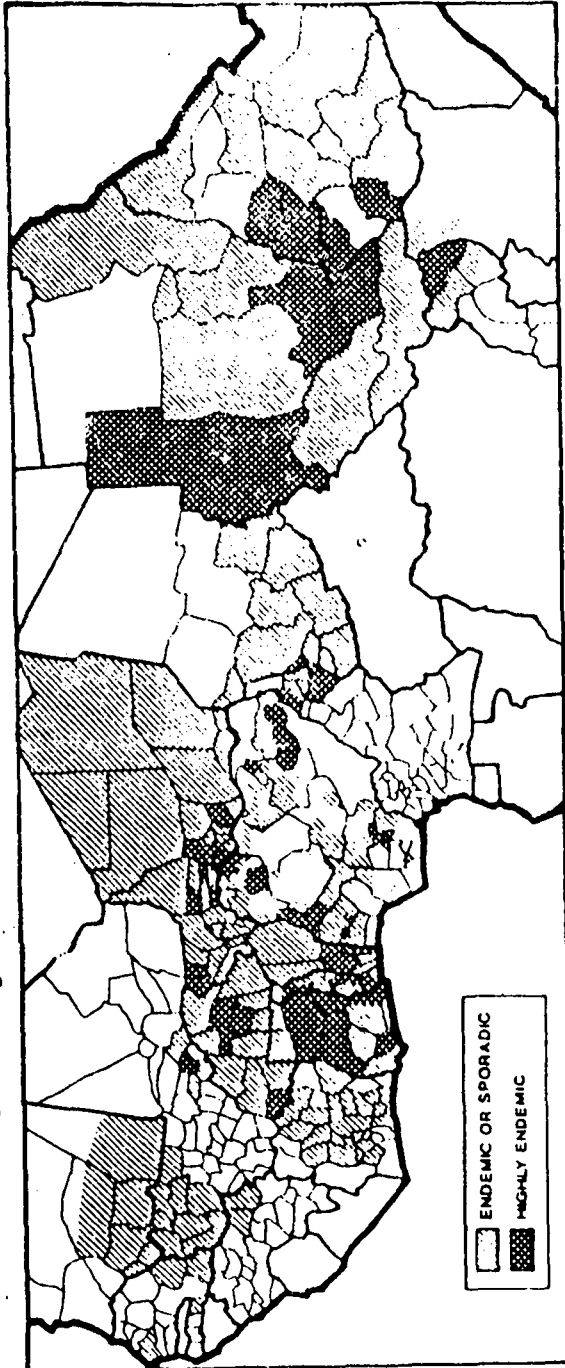
- (i) educate policy makers about problems and needs;
- (ii) prepare data and reports;
- (iii) evaluate progress to date;
- (iv) forward results to the International Conference.

34. Case definition, surveillance and disease reports: The Conference accepts for the purpose of surveillance the case definition of dracunculiasis: "an individual exhibiting or having a recent (one year) history of skin lesion with the emergence of a worm." Each endemic country should establish active surveillance programmes and report to WHO at the end of March every year. Reports should include information on numbers of cases reported by geographical area. The absence of national reporting on guinea worm has adversely influenced support for eradication programmes. Each endemic country is therefore strongly urged to make the reporting of dracunculiasis mandatory immediately.

35. Intersectoral activities and cooperation: At the donor and national levels dracunculiasis eradication efforts should be part of on-going national water supply and sanitation programmes and it should be recognized that in endemic countries these efforts constitute an integral part of child survival and maternal well-being. Appropriate ministries are encouraged to undertake the data gathering, policy development, planning, and programme implementation which are necessary for eradication of guinea worm disease. It is only when such data and plans are made available that donors can respond to requests for assistance. A variety of means should be used to extend the message about guinea worm to populations at risk. Eradication programme participants, such as mothers, women's organizations, farmers, village health workers, etc. should be mobilized to this end.

Map 1

Map 1. Areas of Africa in which dracunculiasis is reported or known to exist*
Carte 1. Régions d'Afrique dans lesquelles la dracunculose est signalée ou attestée*



* Based on information presented at the Niamey workshop, July, 1986 - D'après des informations présentées à l'atelier de Niamey, juillet 1986

Table

REPORTED CASES OF DRACUNCULIASIS BY YEAR, 1984-1987

<u>Country</u>	1984	1985	1986	1987
Benin	...	...	...	400
Burkina Faso	1 739	458	1 837	1 296 ^a
Cameroon	--	168	86	...
Central African Republic	...	31	--	1 322
Chad	1 472	9	314	...
Côte d'Ivoire	2 573	1 889	1 177	483 ^a
Ethiopia	2 882	1 467	3 385	...
Gambia	--	--	--	--
Ghana	4 244	4 501	4 717	18 398
Guinea	--	--	--	--
Kenya	...	...	...	...
Mali	5 008	4 072	5 640	435
Mauritania	1 241	1 291	...	...
Niger	...	1 373 ^b	...	699
Nigeria	8 777	5 234	2 821	216 484
Senegal	...	...	...	...
Sudan	...	...	822	...
Togo	1 839	1 456	1 325	...
Uganda	6 230	4 070	...	...

a Provisional

b Includes other filariasis

... No data available

-- Zero cases reported

SUMMARY OF COUNTRY REPORTS

Benin

Dracunculiasis severely affects all regions of the country. ZOU is the most heavily affected area. Much research on the disease has been carried out in this area. An epidemiological study has not yet been carried out for the country as a whole. The political will to control the disease exists and has led to the appointment of a national official. The authorities in Benin are considering the reimplementation, based on the orientations of this seminar of the national Guinea worm control programme which was drawn up in 1985. In the highly endemic area, an integrated project of health education, drinking water supply and sanitation is in progress (225 wells dug from 1988 to 1989).

Burkina Faso

The serious socioeconomic consequences of the disease has become increasingly recognized. It is estimated that more than 3% of the total population are infected annually. The number of cases peaks from May to August; the report describes the number of cases reported by province and by month for the years 1984-1986 inclusive. Thus the distribution of guinea worm in the country is now broadly known. Active surveillance and identification of endemic communities are among tasks which remain to be performed. Control efforts are limited mainly to improvement of drinking water supplies and health education programmes. A draft national plan of action has been prepared; external assistance for its implementation is being sought.

Cameroon

Guinea worm disease is endemic in the northern region of Cameroon comprising the Upper-Northern, Northern and Adamaoua provinces which have been officially notifiable since 1982. It affects an estimated 1 380 000 inhabitants representing 13.3% of the country's population. National objective is eradication by 1993. Basic data collection and operations research completed. Eradication activities including anticyclops treatment of ponds using temephos, health education and provision of community water supply are scheduled to start by June 1988.

Chad

The disease is localized in the marshy plains of the Majo-Kebbi, Salamat and Tandjile Prefectures. Little data are available on the extent of the disease. Now contemplating starting a control programme but no firm starting dates fixed.

Annex 1

Côte d'Ivoire

Commitment to guinea worm elimination is still strong, mainly through the coordinated activities of the rural health services and an ambitious national village safe water supply programme. Although incidence rates have been significantly reduced, in recent years these gains may be compromised by breakdowns in the maintenance of the village water supply programme. Improved coordination and implementation of additional control procedures, as well as further donor support, will be needed in the years immediately ahead if the objective of guinea worm eradication is to be achieved.

Gambia

Dracunculiasis is not a major health problem in the Gambia. No cases were reported during the past several years. There is however a need to undertake a nation wide survey to confirm the status of the disease especially in the rice growing areas of the country.

Ghana

Guinea worm is endemic in all 10 regions of the country. The average yearly number of cases reported is just over 4000. A survey in the Northern Region, which records the highest number of cases was done in 1987. The actual number of cases estimated from this survey is about 83 000 in a population of 1.3 million people. A national plan of action on guinea worm eradication has been formulated and is due to be implemented in the current year, 1988. The programme, which is in collaboration with Global 2000 Inc. is in three, two-year phases with a target of eradicating the disease by the year 1993.

Guinea

The authorities carried out a vast survey of active surveillance of the disease in February and early March 1988 in the Upper Guinea region. This study, involving all the socio-professional strata in this region, led to the discovery of only two cases of guinea worm reported since 1986. All 56 cases reported in 1969 were the result of an error of codification of cases of onchocerciasis. There is currently no active source of transmission of the disease. SNAPE is scheduled to sink wells in the danger region.

Mali

The disease is severely affecting the whole country with two areas of high prevalence: MOPTI and KAYES (34%). In these two areas research has been carried out with the objective of creating a pilot demonstration area and of evaluating the economic impact of the disease. Studies show that the age group most affected is 15 to 24 years (40.1%), and that the populations do not know the cause of the disease. In this area, the study led to the introduction of the sale of filters, an intense health information and education campaign as well as active screening of patients. Studies on the evaluation of the economic impact are in progress. The national authorities are seeking ways to implement interventions in the whole country.

Annex 1

Mauritania

The disease is severely affecting the whole country with heavy endemicity in the extreme eastern region. (50% of cases). No in-depth epidemiological study has been carried out in the country, but certain studies carried out here and there have led to the conclusion that men and women are equally affected. The length of disability for the disease is approximately two months. A dracunculiasis control project for the country has been drawn up with the short-term objective of testing the effectiveness of a control strategy in 6 villages in the area of high endemicity and the medium and long-term objective of reducing by 95% the annual incidence, estimated at 1000 cases for the entire country. Financing for the execution of this project is being sought.

Niger

The disease exists all over the country. The heavily affected areas are the departments of Niamey and Mardi (73.5% of cases). The rural population is particularly affected. The lower members and the scrotum are the areas most often affected. Patients are seen in particular when complications arise (ankylosis, gangrene, tetanos). From 1980 to 1988 the number of wells and water holes increased from 5120 to 12,231. National authorities intend to take measures for the chemical treatment of polluted waters, the extension of simple filtration techniques and an intense campaign of health information and education regarding the Guinea worm by the mass media.

Nigeria

Much progress continues to be made towards the nationally accepted objective of elimination of dracunculiasis. Since the convention of the First National Conference on guinea worm in 1985 a national plan of action is now being formulated which aims at achieving eradication by December 1995. Priority is given to active case search and to inter-state coordination. The disease is prevalent in 20 of the 21 States; more cases of guinea worm are found in Nigeria than in any other endemic country. Recent research findings reveal that the socioeconomic impact of guinea worm is much more serious than was previously believed. In 1987, a total of N.25 million was budgeted for control purposes and a similar sum for 1988. External financial and other support from international and private agencies (UNICEF, Global 2000) have been provided and continues to be pledged. Remarkable reduction in the number of guinea worm cases have occurred in some areas where intervention was undertaken. Control strategies vary from State to State. ANAMBRA, KWARA, OYO and OGUN States have established task forces specifically for guinea worm control. At present the disease is notifiable in only two States; others will follow. A national workshops on active surveillance and then specific aspects of guinea worm control is scheduled for November 1988.

Annex 1

Senegal

The disease is very rare in the country. Since 1985, only 10 cases have been reported in the BAKEL department (region bordering Mali, Guinea and Mauritania). The national authorities intend to develop an active survey in order to pinpoint the extent of the disease. A vast village water programme, involving the digging and improving of wells, has started up. One hundred and two wells were sunk in the danger area. Chemical treatment of water in polluted ponds, an active epidemiological survey and a health education programme should be considered.

Sudan

Guinea worm is endemic in three of the nineteen provinces in Sudan, namely, Equatoria, Blue Nile and Southern Kordofan. The level of endemity is however not known since it is not a reportable disease.

A recent pilot survey (1986) in the South Kordofan Province (Boram Rural Council Area) involving 18 villages and 397 households indicates average infection rate of 24.6%. This survey was done in collaboration with the UNICEF Water and Environmental Sanitation Project. A national plan of action for the eradication of guinea worm as part of the primary health care is presently under consideration.

Togo

Dracunculiasis is endemic throughout the country but is most prevalent in Bassar, Maho and Zio sub-prefectures officially notifiable. A total of 1456 cases reported in 1985 and 1325 in 1986. A national policy is yet to be formulated although some localized control projects are being implemented. UNICEF, GTZ, CUSO, USAID, World Neighbour and the Evangelical Church have assisted in various community water supply, sanitation and health education projects.

Uganda

The dry northern part of Uganda records the highest number of cases of guinea worm in the country. Unfortunately no data is available due to the political instability in that part of the country. It has not been possible as at now to plan and/or implement any control strategy in the affected areas.

WORKING GROUPS' RECOMMENDATIONS

Five working groups (three English-speaking, two French-speaking) were formed to discuss and identify six major problems in guinea worm control and eradication programmes. Each major group was constituted of three sub-groups which were made up of professionals from the various operational areas required for the control of the disease, for example, researchers, epidemiologists, health educators, water and sanitation engineers. Furthermore, the group meetings were entirely facilitated by participants.

Having analysed the causes of the problems identified, the groups proceeded to develop the following recommended solutions for planning and implementing the control and eradication of dracunculiasis.

Lack of resources

- (a) An effective of feasible proposal is essential when soliciting funds. Proposals should include:
 - (i) the identification and use of competent personnel to write proposals;
 - (ii) the clear identification of objectives, goals and means of verification;
 - (iii) clear understanding of assistance needed;
 - (iv) clearly outlined budget and plan of action which included activities, commencement and completion dates, budget, and specification of responsible personnel;
 - (v) a clear statement of existing resources including management capacity to absorb and utilize existing resources, and additional resources;
 - (vi) a clear outline of the project, cost beneficial and sustainable impact.

Annex 2

(b) Manpower development

- (i) identify the personnel needed and available;
- (ii) determine the gap between available and needed resources;
- (iii) select and train personnel;
- (iv) provide appropriate incentives in cash and in kind.

(c) Funds

Recognizing that there is competition for scarce resources, Ministry of Health can organize a donors' conference, ensure a marketable project, explore alternative resources and require donors to specify programmes and areas of interest for funding.

LACK OF DATA

Improve data base:

- training at all levels;
- development of simple and standardized reporting format;
- develop efficient and effective network for collection of primary data;
- set up mechanism for data retrieval;
- let local community member know why information is required and train staff and community in assisting in the process.

LACK OF COMMITMENT AND SUSTAINABILITY

(a) International level

- (i) international donors readiness to accept and transfer on-going programmes to any political changes in government;
- (ii) improved information dissemination and information.

Annex 2

(b) National level

- (i) continued reminder to policy makers about on-going guinea worm programmes, and the human consequences of the disease;
- (ii) continued lobbying;
- (iii) strengthen methods for soliciting assistance;
- (iv) ensure utilization of professionals by providing them with adequate resources and incentives.

(c) Local level effective

Need for health education, community participation and the use of community-based resources.

LACK OF AWARENESS OF THE SOCIOECONOMIC CONSEQUENCES
OF THE DISEASE AT ALL LEVELS

(a) International

- (i) publicize available information about the consequences of the disease, on crop production, infants and mothers;
- (ii) continued effort in research and documentation;
- (iii) intensive and conscious mass media efforts at the international level through films, articles in the popular press and continued support by key international personalities.

(b) National level

- (i) adequate public education, surveillance and research;
- (ii) improved rural communications and accessibility.

(c) Local level

- (i) strengthen the support and emphasize on community participation, health education and information dissemination;

Annex 2

- (ii) continue support of participation by local village level organization in the provision of basic amenities, e.g. water;
- (iii) ensure the continued feedback on village level activities to national government authorities and full recognition of local efforts.

INTERSECTORAL COOPERATION

- (a) Ensure the full participation of agencies involved in guinea worm control programmes: health, water, agriculture, social affairs, community development, rural development, education, rural mobilization, infrastructure and roads programme.
- (b) Ensure that the coordinating sector, health, works out a mechanism for such cooperation, by ensuring who does what, when and where.
- (c) Ensure that policy decisions within each of the above-mentioned sectors consider guinea worm eradication a government commitment.
- (d) A department should be identified with the full responsibility of planning, organizing, coordinating, monitoring and evaluating all the above agencies efforts in guinea worm eradication.

LACK OF COMMUNITY INVOLVEMENT AND EDUCATION

- (a) Understand local village level decision-making processes and ensure that the formal and non-formal authorities in each community are involved.
- (b) Ensure that district level government staff use adult learning methodologies in communicating messages to villages. Ensure that they are trained in training, rather than lecturing to villagers.

Annex 2

- (c) Ensure that community-based agents are sufficient in number to provide adequate coverage of all villages, are well supplied with necessary training materials, have means of transportation, and are adequately and regularly paid.
- (d) Ensure that both communities and health agents understand that the results of actions directed towards guinea worm cannot be discerned immediately (at least one year time lag).
- (e) Ensure that adequate time is spent in preparing communities to undertake water projects; ensure that they are provided with equipment and training to carry out any failures in the system.

ANNEX 3

REPORT ON DONORS' CONFERENCE

Dr Hopkins opened the donors' conference by stating that the problem of guinea worm disease control needed resources to solve the same and that was why donor agencies were asked to come to Accra although a few have only come. He however called on the few present to state their pledge for the eradication of dracunculiasis.

There is also a technical panel which can assist each country in this regard.

The UNDP Representative in Accra stated that the victory of smallpox should be taken as an example so that other diseases can also be eradicated, e.g. guinea worm disease. United Nations Development Programme therefore pledged to donate US \$50 000 for the eradication of dracunculiasis. The World Health Organization which is not a donor agency but a technical one gets its funding in three ways:

- (i) Regular global budget.
- (ii) Voluntary contribution for specific programmes, e.g. Tropical Disease Research, AIDS Control and Cancer Research.
- (iii) Extrabudgetary funding.

World Health Organization also pledged to donate US \$50 000 as technical cooperation for the 19 African countries for the eradication of guinea worm disease by 1995. As for the World Bank, Mr Benett stated that the agency has no special programme for the elimination of the guinea worm disease but the World Bank supports primary health care activities in some countries and this can be used to eradicate guinea worm disease.

In Ghana, the World Bank supports two programmes all in water supply. United States \$2 million is for rural water supplies and US \$5 million for wells construction in guinea worm infected areas in Ghana. A document for requesting funds from World Bank will be circulated to every delegate.

Mr Denis of USAID said that if a government sets priorities then AID can assist. If the issue of guinea worm disease is raised by the Ministry, funds can be provided from other programmes, e.g. WASH.

Annex 3

Training of staff in the control of tropical diseases is also undertaken by USAID.

Dr Hopkins urged delegates representing their countries to know the extent of guinea worm disease in their countries before any funding can be requested from any donor agency. He emphasized the importance of surveillance and reporting of the disease.

Other agencies spelt out their roles in various fields in many African countries and their commitment particularly for the eradication of guinea worm disease by 1995.

ANNEX 4

RESOURCES QUESTIONNAIRE¹

The purpose of this questionnaire is to determine what resources each country can offer to other countries where guinea worm disease is endemic. The responses will be tabulated and made available to the conference participants so that they can make follow-up requests.

1. Country _____
2. Name(s) and title of principal contact for guinea worm _____

3. Address of contact _____

4. We can assist other countries in the following ways (check the ones which apply):

	<u>Check if you</u>	<u>Add details</u>
	<u>can provide</u>	
(a) Supply written materials (e.g., training materials, programme guidelines, etc.)	_____	_____
(b) Send a technical adviser for programme development and/or implementation	_____	_____
(c) Host a visit to a project with a guinea worm control component	_____	_____
(d) Provide training	_____	_____
(e) Participate in a joint research project	_____	_____

¹ Presented by Water and Sanitation for Health and Vector Biology and Control Projects of USAID.

Annex 4

Check if you
can provide

Add details

(f) Supply project information
such as cost data, problems
encountered lessons
learned, etc.

(g) Provide help in the design
or implementation of
an evaluation

(h) Assist in a public awareness
campaign

Annex 4(a)

COUNTRY RESOURCES FOR CONTROL OF GUINEA WORM DISEASE

Organizations which can provide training materials,
programme guidelines, etc.

<u>Country</u>	<u>Organization</u>
Burkina Faso	Centre Muraz/OCCGE Section Parasitologie
Burkina Faso	Ministère de la Santé Publique
Chad	Direction du Genie Sanitaire
Ghana	World Vision/LSD-Rural Water Project
India	National Institute of Communicable Diseases
Nigeria	UNICEF Assisted Water and Sanitation Project
Togo	Ministère de la Santé Publique
United States	AID/S&T/H
United States	Centres for Disease Control

Organizations which can provide technical advisers for control programmes

Burkina Faso	Centre Muraz/OCCGE Section Parasitologie
Burkina Faso	Ministère de la Santé Publique
Cameroon	Ministry of Health/Epidemiology and Malaria Service
Ghana	World Vision/LSD-Rural Water Project
Togo	Hospital Bethesda
Togo	Ministère de la Santé Publique
United States	AID/S&T/H

COUNTRY RESOURCES FOR CONTROL OF GUINEA WORM DISEASE

Organizations which can host visit to project with
GWD control component

<u>Country</u>	<u>Organization</u>
Burkina Faso	Centre Muraz/Section Parasitologie
Côte d'Ivoire	S/D Grandes Endemies
Mali	Division Epidemiologie et Prevention
Niger	Direction d'Hygiene et de la Medecine Mobile
Nigeria	UNICEF Assisted Water and Sanitation Project
Senegal	Ministère de la Santé Publique Service National de l'Hygiene/DHPS
Togo	Hopital Bethesda
Togo	Ministère de la Santé Publique
Togo	Service de Parasitologie

Organizations which can provide training for GWD control programmes

Burkina Faso	Centre Muraz/Section Parasitologie
Burkina Faso	Ministère de la Santé Publique
India	National Institute of Communicable Diseases
Pakistan	National Institute of Health
Togo	Hopital Bethesda
Togo	Ministère de la Santé Publique
United States	Centers for Disease Control

Annex 4(c)

COUNTRY RESOURCES FOR CONTROL OF GUINEA WORM DISEASE

Organizations which can participate in Joint Research Projects

<u>Country</u>	<u>Organization</u>
Burkina Faso	Centre Muraz/Section Parasitologie
Burkina Faso	Ministère de la Santé Publique
Cameroon	Ministry of Health/Epidemiology and Malaria Service
Chad	Direction du Genie Sanitaire
Côte d'Ivoire	S/D Grandes Endemies
Gambia	Medical Headquarters
Ghana	Ministry of Health
Ghana	Parasitic Diseases Control Unit Division of Epidemiology
Ghana	World Vision/LSD-Rural Water Project
Mali	Division Epidemiologie et Prevention
Mauritania	Ministère de la Santé et des Affaires Sociales
Niger	Direction d'Hygiene et de la Medecine Mobile
Nigeria	UNICEF Assisted Water and Sanitation Project
Norway	Dr Anders R. Seim
Pakistan	National Institute of Health
Senegal	Ministère de la Santé Publique Service National de l'Hygiene/DHPS
Togo	Hopital Bethesda
Togo	Ministère de la Santé Publique
United States	AID/S&T/H

Annex 4(d)

COUNTRY RESOURCES FOR CONTROL OF GUINEA WORM DISEASE

Organizations which can supply information on project costs, lessons learned, etc.

<u>Country</u>	<u>Organization</u>
Burkina Faso	Centre Muraz/Section Parasitologie
Cameroon	Ministry of Health/Epidemiology and Malaria Service
Ghana	Ministry of Health
Ghana	Parasitic Diseases Control Unit
	Division of Epidemiology
Ghana	World Vision/LSD-Rural Water Project
Guinea	Service National de Prevention
Mauritania	Ministère de la Santé et des Affaires Sociales
Nigeria	UNICEF Assisted Water and Sanitation Project
Pakistan	National Institute of Health
Togo	Hopital Bethesda

Organizations which can assist in the design or implementation of evaluations

Burkina Faso	Centre Muraz/Section Parasitologie
Gambia	Ministère de la Santé Publique
Ghana	Ministry of Health
Ghana	Parasitic Diseases Control Unit
	Division of Epidemiology
Ghana	World Vision/LSD-Rural Water Project
India	National Institute of Communicable Diseases
Nigeria	UNICEF Assisted Water and Sanitation Project
Pakistan	National Institute of Health
United States	AID/S&T/H

Annex 4 (d)

Organizations which can assist in public awareness campaigns

Burkina Faso	Centre Muraz/Section Parasitologie
Burkina Faso	Ministère de la Santé Publique
Cameroon	Ministry of Health/Epidemiology and Malaria Service
Chad	Direction du Genie Sanitaire
Ghana	Parasitic Diseases Control Unit Division of Epidemioslogy
Côte d'Ivoire	S/D Grandes Endemies
Mali	Division Epidemiologie et Prevention
Mauritania	Ministère de la Santé et des Affaires Sociales
Niger	Direction d'Hygiene et de la Medecine Mobile
Norway	Dr Anders R. Seim
Togo	Ministère de la Santé Publique

PROGRAMME OF WORK

Monday, 14 March

- 8.00 Registration
- 9.00 Opening
- Ministry of Health
President Carter
Professor Monekosso, Regional Director
- 10.00 Group photo
- 10.15 Break
- 10.35 Election
- 10.45 Adoption of programme/method of work
- 11.00 Film
- 11.30 Status of guinea worm programmes
- Dr Donald Hopkins
Senior Consultant
Global 2000 Inc.
- 12.00 Lunch
- 14.30 Indian guinea worm programme
- Dr P. N. Seghal
Former Director
Indian Guinea Worm Eradication Programme
- 15.15 W. S. H. Decade
- Dr Peter Bourne and Dr Alexander Rotival
Director UNDP - WHO Coordinator
Global Water EHE - WHO Geneva

Annex 5

- 15.35 Pakistan guinea worm programme
Dr Abdur Rab
Director
Pakistan Guinea Worm Eradication Programme
- 16.30 General discussion on the day presentations
- 17.00 Orientation of the groups for the workshops
- 17.30 End.

Tuesday, 15 March

- 8.00 Country reports
- 10.00 Break
- 10.00 Country reports (continued)
- 12.00 Lunch
- 14.30 Workshop I
Control programmes
Identification of problems
Planning phase
Implementation phase
- 17.30 End.

Wednesday, 16 March

- 8.00 Presentations
Agricultural impact
- Carel de Rooy
Chief
Water and sanitation section, UNICEF, Lagos Office

Annex 5

- Dennis Long
USAID
Cost-benefit ratios of interventions
- John Paul, PH.D
Research Health Analyst
Research Triangle Institute, North Carolina
- 9.30 Dr Karl Kappus
CDC/Atlanta
Effective Surveillance to Eliminate Guinea Worm
- 10.10 Break.
- 10.30 Effects on MCH
 - Bill Brieger
Indian University (On National Morbidity)
 - May Yacoob
WASH (On Child Care Impact)
 - Sussan Watts
University of Rhodes Island, USA
- 12.00 Lunch
- 14.30 Workshop II
Problem analysis
- 17.30 End.

Thursday, 17 March

- 8.00 Resources
Donors/PVO's Panel
Panel on technical cooperation WHO/G AFO, CDC

Annex 5

- 10.00 Break
- 10.20 Workshop III
(Continuation)
- 15.30 (Simultaneously)
- a - Country Action Plan
Individual country will elaborate their respective action plan (19 groups)
 - b - Preparation of presentations of workshop groups (group reports) (1, 2, 3, ...)
 - c - General recommendations and review of draft manual will be carried out by the respective committees.

Friday, 18 March

- 8.00 Workshop reports
Presentation and discussion
- 9.30 Discussion of general recommendations
- 10.30 Break
- 11.00 Closing

Please Note:

* Afternoon coffee break will be from 16h15 to 16h30.

Annex 5(a)

CHAIRMEN/PRESIDENTS AND RAPORTEURS FOR THE CONFERENCE

14 March Chairman/Président Dr J. A. Adamafio (Ghana)
Rapporteur (F) Mr Cricel Michel (Bénin)
" (E) Dr Eka Brade (Nigeria)

15 March Chairman/Président Dr M. E. K. Adibo (Ghana)
Rapporteur (F) Dr Agbo Kossivi (Togo)
" (E) Dr F. Ahmed El Khitam (Sudan)

16 March Chairman/Président Dr Boualou Henri (Côte d'Ivoire))
Rapporteur (F) Mrs Agbo-Tabi Debora (Cameroon)
" (E) Mr Dawda Joof (Gambia)

17 March Chairman/Président Dr Donald Hopkins (Global 2000)
Rapporteur (F) Ibne Deme (Sénégal)
" (E) Mr C. J. K. Otwele (Uganda)

18 March Chairman/Président Prof. O. O. Kale (Nigeria)
Rapporteur (F) Dr Dramane Sangare (Mali)
" (E) Dr V. L. L. Asigri (Ghana)

ANNEX 6

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1. Opening addresses and proceedings

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2. Country Representation

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Dr F. MCCOLLOUGH
Dr V. L. L. ASIGRI

3. Technical presentations and panels

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Dr J. B. ROUNGOU
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4. Workshop Recommendations

Dr May YACOOB
Dr A. D. LONG
Dr Susan WATTS
Dr J. W. D. RIVERSON

Conference Conclusions and Recommendations

Conference coordinators.
Chairman of each working committee.

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ANNEX 7

SUMMARIES OF THE PRESENTATIONS

ANNEX 7(A)

DRACUNCULIASIS ERADICATION: THE END OF THE BEGINNING

by

Donald R. Hopkins, M.D., M.P.H.

India is the first country to undertake Guinea Worm Eradication Programme (GWEP). The guinea worm eradication programme was conceived in 1979. The first case search operation was carried out in December 1980. The guinea worm eradication programme was launched in 1983.

The National Institute of Communicable Diseases, Delhi, is responsible for training, monitoring and coordination of the guinea worm eradication programme activities at the central level.

In the affected states, the programme functions under the overall charge of the Director of Health Services who is assisted by a senior level officer identified as the Programme Officer. At the district level, usually the health supervisors, paramedical assistants and health educators assist the district health officer. In the Primary Health Centres (PHCs) the medical officer - in charge have overall responsibility for the implementation of the programme. The searches and other activities are carried out by various categories of PHC workers such as multi-purpose workers and health assistants.

The Ministry of Rural Development is the central authority on the Public Health Engineering side. The State Rural Water Supply Departments responsible for rural water supply are required to coordinate with the State health departments for provision of safe water supply to guinea worm affected villages/hamlets on priority basis. The guinea worm eradication programme has been linked to the International Drinking Water Supply and Sanitation Decade (1981-1990).

Guinea Worm Eradication Programme (GWEP) strategies:

- (i) Case search operation, twice in a year to be carried out simultaneously in the endemic states for about a period of seven days. The search is to be carried out once during May to June (peak season) and once during November to December (lean season). All the villages/hamlets are to be visited by the public health care peripheral workers. While visiting they use a recognition card designed by NICD.

Annex 7 (a)

- (ii) Provision and maintenance of safe water supply by the public health engineering department of the states/district and conversion of unsafe water sources including step wells into safe water supply. A book showing the guinea worm affected villages/hamlets in its safe and unsafe water sources and the number of guinea worm cases yearwise was prepared by all endemic states; districtwise and primary health care wise. This information is passed on to the public health engineering side responsible for supply of safe drinking water.
- (iii) Chemical treatment of unsafe drinking water sources: temephos 50 percent emulsion concentrate (EC) is being used as a cyclopoide in the unsafe drinking water sources. The chemical has very low mammalian toxicity. The recommended dose is 1 ppm (part per million). Proper application in proper dosages are to be carried out by the peripheral health worker under a health supervisor.
- (iv) Health education: Community to be educated with proper media about the transmission chain of the disease, how the disease is caused and how to prevent it. Simple measures like sieving the water can filter out the cyclops and thus can prevent the disease. The community should understand the importance of not allowing a case with blister/ulcer with a protruding worm to enter a drinking water source.

There is an overall declining trend in endemicity of the disease in all the six states. The total number of cases have declined from 39 792 in 1984 to 14 296 in 1987. The tempo in all the activities, towards eradication measures is gradually picking up and the provision of safe water supply to the affected villages are being geared up by the public health engineering departments of the states. Keeping in view of the trend of the disease and the tempo of the programme, it appears that the guinea worm disease eradication is possible by the end of 1990.

Annex 7 (B)

GUINEA WORM DISEASE AND THE WATER DECADE

by

Peter G. Bourne, M.D.

When the International Drinking Water Supply and Sanitation Decade was created it was never intended that it would only last ten years or that its goals could be fully achieved in that time. It has been successful in providing tens of millions of people with clean water and in creating a new priority for this sector at the national level. Plans are underway, as the result of a recent meeting in Interlaken, Switzerland to extend the Decade in the same form.

Guinea worm has become a major issue as a result of the Water Decade, so much so that at a recent meeting of the United Nations Steering Committee the Chairman said, "the eradication of guinea worm may well be the single most important legacy of the Water Decade".

I am making the following recommendations:

First, support the recommendations of the Interlaken meeting. Second, send a report on the status of the eradication campaign to all the donor representatives who attended that meeting.

Third, request National Action Committee to stay in existence at the end of the Decade and work with their coordinating committees for eradicating guinea worm.

Fourth, target water programmes to guinea worm area, emphasizing hand-dug wells, rain harvesting and education.

Fifth, use the next two years to generate publicity. Especially use PVOs involved in development education for this purpose. Wateraid in Britain could be particularly useful in this.

SUMMARY OF THE STATEMENT

by

Alexander H. Rotival, UNDP/WHO Coordinator
International Drinking Water Supply and Sanitation Decade

Recent statistical surveys indicate that at the midpoint of the Decade 1.2 billion persons in developing countries were without potable water supplies while rural water supply coverage has increased only five percent between 1980-1985 to reach 36% coverage. This inadequate coverage exacerbates the high level of infant mortality and underlines the fact that 80% of illness and disease is directly caused by unsafe water and inadequate sanitation.

Investment required on the basis of conventional technology approach, at an estimated 600 billion, cannot be mobilized while the adaptation of low cost technologies particularly for rural areas can be achieved at one-third of the investment cost. Technology options developed in the 1980's particularly under the stimulation of the UNDP/World Bank core programme combined with the necessary community managed approach and integration with hygiene and primary health care have resulted in the identification of hardware and software packages which are sustainable and replicable.

This is characterized as the "Decade Approach" which has achieved a consensus in developing countries as well as with the donor community most recently at the Interlaken Consultation in 1987 which promulgated coordinated strategies including resource mobilization with an extension of the programme horizon to the year 2000.

The "Decade Approach" and the renewed commitments of the donor community vastly enhances the prospects of meeting the Decade goals of full coverage.

Annex 7(D)

SUMMARY OF GUINEA WORM DISEASE IN PAKISTAN

Guinea Worm Disease survey for identifying disease infested villages in Pakistan was conducted during a two week period of June 1987, in nine districts suspected of having guinea worm disease. (A total of 4314 villages). Trained health workers, using specially developed questionnaires and recognition cards participated in this exercise. Two hundred and fifty one (5.8%) villages reported guinea worm disease. Validation of this survey by independent observers in 101 randomly selected villages confirmed the results in 83% villages. Twelve percent showed false positive and 5% false negative results. An additional 154 villages with guinea worm disease in the same districts were identified by the staff of EPI and malaria programmes during the course of their normal duties. A total of 405 villages with a population of 361 855 have thus far been identified as having guinea worm disease in Pakistan. Of these 79 (19.5%) villages with a population of 14 710 (41%) are located in NWFP, 70 (17.3%) villages with a population of 5890 (16.3%) in Punjab and 256 (63.2%) villages with a population of 155 341 (12.7%) are located in the Sind province. In 77 (19.0%) villages, more than ten cases of guinea worm disease per year are reported.

A follow-up survey in October 1987 in a randomly selected sample of 107 guinea worm disease positive villages, (population 45 437), the disease incidence was found to be two percent. Majority of the cases (86%) occurred between June through October, with 50% occurring in the months of August and September alone. Forty four percent of cases had one worm emerging. Twenty four percent had two and 32% of the patients have three or more worms emerging from their bodies. Eighty-one percent of cases were over 10 years of age, 4% were between 6 to 10 years and 5% were children under five years. The male/female ratio was 1:2 respectively.

GUINEA WORM CONTROL AS A MAJOR CONTRIBUTOR TO
SELF-SUFFICIENCY IN RICE PRODUCTION IN NIGERIA

by

Carl de Rooy, Chief
Water Sanitation Section, UNICEF, Lagos Office

A pilot study was conducted in nine (9) Local Government areas of Nigeria with the primary aim to investigate the relationship between guinea worm morbidity and rice production, and to solicit financial support towards the elimination of guinea worm disease.

Objectives

- (i) To establish the relationship between guinea worm morbidity and rice production.
- (ii) Illustrate the benefits of guinea worm control and relate these to increase in rice production.
- (iii) Identify and cost for intervention strategies.

Strategy

The strategies adopted are: (i) provision of safe water supply; (ii) health education; (iii) distribution of nylon monofilament; (iv) chemical treatment of ponds; (v) community education and mobilization, i.e. radio programmes, bill boards, etc. and (vi) improve sanitation through the construction of latrines.

Impact

The potential benefits were: (i) reduction in man-days lost; (ii) potential for cost recovery; (iii) potential for expansion in rice production and (iv) dramatic reduction in the incidence of guinea worm disease.

Conclusion

The findings indicate that the eradication of guinea worm can rapidly increase agricultural production.

Annex 7(F)

IMPLEMENTATION PLANNING AND COST-BENEFIT ANALYSES
IN GUINEA WORM ERADICATION PROGRAMMES

by

John E. Paul, Ph.D.

A microcomputer-based implementation planning and cost-benefit model for guinea worm disease was developed in 1986 as part of the Water and Sanitation for Health (WASH) Project (funded by USAID). The model was field tested during 1987 with the Pakistan Guinea Worm Eradication Programme, a comprehensive effort under the direction of National Institute of Health (NIH) (Pakistan) to eliminate the disease from that country by 1992.

Given the different guinea worm disease prevalence rates, socioeconomic situations, and indicated intervention strategies in the guinea worm economic areas in Pakistan, three separate planning and cost-benefit models were developed as part of the field-test of the model. Programme designs and estimated costs for possible guinea worm intervention programme were prepared for each of the three endemic provinces. The estimated costs reflect different assumptions regarding the number of endemic villages and the intervention strategy. The microcomputer-based implementation model then linked the planning aspects represented in the design and cost spreadsheets with spreadsheets projecting cost and benefit flows over time, again separately prepared according to the three strategies in the endemic provinces. Data relating to lost productivity was derived from Pakistan Government census and agricultural output estimates. Overall benefit-cost ratios (BCRs) were favourable, within the limitations of the programme assumptions and the available data. A benefit-cost ratio of 1.14 was obtained projecting benefit and cost flows over a 10 year period at a 7.5% discount rate. A basic selective sensitivity analysis was also conducted to test effects of changes in certain parameters in the model.

The field test indicated the modeling process and cost-benefit simulation could be applied in an actual country situation and for an actual guinea worm control programme. The implementation model can serve as a framework for further guinea worm intervention programme design and elaboration. The results of the cost-benefit analysis can serve as a basis for a more comprehensive economic analysis of guinea worm disease. Current estimates and assumptions, however, must be considered open to elaboration and improvement.

EFFECTIVE SURVEILLANCE TO ELIMINATE DRACUNCULIASIS

NEW TASKS FOR OLD TOOLS

by

Karl KAPPUS, Ernesto RUTZ, Donald HOPKINS

Effective surveillance is the most fundamental and critical element for a successful programme to combat dracunculiasis. As with disease surveillance in general, the collection of accurate data and its timely dissemination to all those who need it is required.

The special significance of surveillance for dracunculiasis elimination are indicated by its functions:

- (a) it is key to mobilizing political and financial support;
- (b) determines the location and extent of the problem;
- (c) helps in the planning and implementation of control activities;
- (d) permits one to evaluate the impact of control activities;
- (e) provides a means for verifying eradication.

At present most endemic countries in Africa have collected only a small amount of data on the occurrence of guinea worm disease and most of this data has been from passive reporting. It is critical that much increased reporting of guinea worm disease is undertaken and disseminated to WHO in a timely fashion. Encouragingly, much better information will soon be available as many countries are improving their reporting and active search for guinea worm disease are underway in Ghana and Guinea and preparation for search have begun in Nigeria and other African countries.

Annex 7(g)

Guinea worm disease surveillance can be designed for maximum effectiveness. Although guinea worm disease is easily recognized, there are several obstacles to case detection including its geographic and temporal facility, its remote localization, the immobilization of the patient caused by the disease and that infected persons knowing that curative medicine is not available do not seek medical assistance. There are reasons that routine passive reporting identifies such a small percentage of cases.

However, these obstacles can be overcome and in fact turned to advantages when active searches have identified the endemic villages so that resources can be concentrated precisely on those villages at the optimal time periods.

Effective surveillance must be designed for the phase of guinea worm elimination that is underway in the country. We consider four phases:

- (i) collecting and using available information (this is the phase of activity in most of the endemic countries now);
- (ii) defining areas where guinea worm disease occurs (the national search);
- (iii) guiding elimination of guinea worm disease (control activities are underway and surveillance determines if they are effective);
- (iv) confirming elimination of guinea worm disease.

Specific surveillance efforts should be conducted during each phase but they should always include two key elements. First, that surveillance is always conducted with the objective of supporting the eradication effort - data is not collected as a routine or an end in itself. Second, that surveillance planning and implementation always incorporates independent monitoring and validation.

When these guidelines are followed surveillance indeed becomes the foundation for a successful guinea worm eradication programme.

GUINEA WORM: WHAT HAPPENS TO MOTHERS AND THEIR CHILDREN (SUMMARY)

Applied research funded by WASH - Water and Sanitation
for Health Project, Arlington, Virginia

Implemented by W. BRIEGER, University of Ibadan
Susan WATTS, WASH Consultant, Rhode Island College
and MAY YACOOB, WASH

Studies have been done on the prevalence of and disability from guinea worm in the general population, but little information exists about how the disease affects women. Such data would have serious implications for child survival and development. In January 1988 a team of researchers sponsored by the Water and Sanitation for Health Project (WASH), designed and carried out a pilot study to determine the possible impact on maternal and child health.

The study was based in two Nigerian Communities where guinea worm is endemic: Idere town in Oyo State and several small villages in Asa and Mbro Local Governments in Kwara State. Mothers of children aged 24 months and younger were the primary target. Focus group interviews helped determine the parameters for study and provided ideas for an in-depth interview guide. Forty-two women who were suffering from guinea worm took part in the in-depth interviews. Their experiences with guinea worm were developed into case studies. Careful analysis of the 42 case studies produced the study results, that is trends and patterns in four major variables: self-care functions, child care duties, domestic activities and economic pursuits.

A large portion (38%) of mothers were bedridden during their bout with guinea worm, while 28% could only move with use of a stick. Self-care suffered greatly during this period. Most experienced loss of appetite and had difficulty bathing and moving out to defecate.

Most women (71%) could do no normal domestic chores at some point in their illness while 24% were confined to cooking and other home-based duties.

All mothers tried to breastfeed but one had to stop due to a guinea worm ulcer on her breast.

- Of 15 who defaulted from innunization, eight were directly as a result of guinea worm.

Annex 7(h)

- Of 15 illness episodes among the children, six received no treatment, because of their mother's guinea worm infection. The rest were given mostly home treatment or drugs bought in local shops.

Women in the study communities play a major role in generating income for the family, especially for the children.

- Most women could not continue with their regular work (farming, trading, crafts) during guinea worm.
- Those who could estimate income averaged a loss of US \$70 during their illness. This compares to an annual per capita income of US \$125 for the area.

Disabled mothers received help from family and friends, but where guinea worm prevalence was high, less help was available. Even in lower prevalence areas, economic activities took well family members out of the house leaving the sufferer and her child alone.

The study reached six major conclusions:

- (i) Guinea worm has a definite and observable negative impact on women.
- (ii) The case study approach to the research was appropriate for highlighting the dynamic process of guinea worm suffering and disability.
- (iii) There was observable impact of maternal disability on some children, but greater long-term effects are likely.
- (iv) The financial impact on mothers, the children and families is large and affects nutrition.
- (v) Social support systems are severely taxed when guinea worm prevalence is high.
- (vi) Even in areas where there is less guinea worm, traditional helping networks have been weakened due to economic pressures.

Annex 7(b)

Policy implications of the study include the need to link guinea worm control and water supply projects closely with child survival programme. Women's participation will be essential in such programmes. Guinea worm control is an investment that will yield dividends in maternal health and family economic well being.

Annex 7(1)

SUMMARY OF REMARKS BY PRESIDENT JIMMY CATER

Mr Cater remarked that at his press conference in Lagos the day before, he was asked why he was involved in a programme to eliminate guinea worm. He replied that it was because so many persons in Africa suffer from a disease that is so often overlooked, yet can be prevented. Even government leaders he has met in endemic countries often are unaware of the existence of the problem in their country.

In Nigeria where about 2.5 million persons suffer from guinea worm in all 21 States, a UNICEF-assisted study suggests losses due to guinea worm of 20 million dollars in rice production each year in one area of the country. This conference will help bring attention to this disease, which affects farmers and school children.

Providing safe water is the best but most expensive intervention. Health education through various mass media to teach people to filter their water through a cloth is a more feasible answer. This programme offers rich political and economic benefits to leaders who recognize and act on the opportunity. The success of this eradication programme can inspire health agencies to target other diseases such as polio, measles and yaws for eradication.

The efforts of Global 2000 of the Carter Centre against dracunculiasis are supported financially by the Bank of Credit and Commerce International (BCCI). In Ghana, Global 2000's agricultural programme began two years ago helping 40 farmers to increase production of food grains. Last year they were helping 200 farmers, and this year 18 000 farmers.

Mr Carter pledged his full commitment until guinea worm is eradicated. This is an opportunity to show the world what can be achieved through primary health care.

SUMMARY OF ADDRESS BY
DR G. L. MONEKOSSO, REGIONAL DIRECTOR OF WHO FOR AFRICA

Dr Monekosso thanked the people and government of Ghana for their warm welcome and for hosting the workshop, and the delegates attending for their interest in control of major endemics, of which dracunculiasis is one of the most important. He also thanked former U.S. President Jimmy Carter for helping in the battle against this and other diseases, disasters and the hunger.

This meeting is held in follow up to the conference held at Niamey, Niger in July 1986, and we should take pride that this second workshop is convened at the place and date agreed upon. He reviewed the objectives of this workshop, which should also help us to mobilize public opinion and the international community against dracunculiasis.

The Indian Guinea Worm Eradication Programme has demonstrated that guinea worm can be eliminated by simple means based on a primary health care strategy. We should use the little time left in the International Drinking Water Supply and Sanitation Decade to come as near as possible to our objective of eradicating guinea worm in all endemic countries by providing safe drinking water. However, although dracunculiasis is in theory easily eradicated, in practice that will be more difficult to attain, and we must be equal to the task.

With appropriate effort we should be able to ensure that all endemic countries will have begun a national guinea worm control programme by 1990, and that by 1995 over half of the endemic region will be free of dracunculiasis.

Annex 7(K)

SUMMARY OF SPEECH DELIVERED BY MR JUSTICE D. F. ANNAN
MEMBER OF PNDC, GHANA

On behalf of the PNDC government and the people of Ghana, he welcomed all the participants and the invited guests including Mr President and Mrs Carter and the WHO Regional Director for Africa, Professor G. L. Monekosso.

He opened his speech by elaborating on the extremely important nature of the Conference for he considered guinea worm to be basically a disease of the rural dwellers who constitute 70% or more of the population, that is, a problem that was potentially a threat to the well-being of the majority of the people.

He expressed his gratitude to the organizers of both the Niamey and Accra workshops for drawing the attention of the International Community to this important health problem. He cited the effort to combat guinea worm as an example of the multi-pronged attack on the many factors contributing to poor health in our societies.

Stressing on the simple nature of the life cycle of the guinea worm, he mentioned its sequelae of enormous social and economic consequences. He cited the effects it has on children's education and on food production simply because there are no reliable sources of good drinking water.

The PNDC member lamented over the fact that at both the national and international levels, policy initiatives have not been matched by firm action programmes. This he said has led to the lagging behind of the social and developing needs of the rural communities.

He expressed the hope that at the end of the deliberations, concrete action programmes with defined emphasis on the need for support from national and international resources would be reached. He continued by appealing for additional international sources of funds without the usual conventional conditions that characterize loans and facilities that service programmes and projects.

Annex 7(K)

On behalf of all those present he thanked Mr President Jimmy Carter, for establishing the Global 2000 Inc. which seeks to address the basic needs of rural communities, including guinea worm control in developing countries, Mr Aga Abedi of Pakistan and Mr Sasakawa of Japan, all dedicated and conscientious humanist as well as the staff of Global 2000 Inc. for their interest and financial support.

Touching on the New Economic Order the PNDC member recounted the hopes expressed ten years before, by the Third World that the primary health care concept would encourage a shift of international assistance. But when one looks carefully at the performance of the developed countries now, these deeds of the developing world had fallen short of expectation. He suggested that one of the outputs of the workshop should be a resolution calling for massive international assistance, not only for the control of the guinea worm but also for primary health care in developing countries.

Touching on Ghana, the PNDC member expressed the delight of his country in hosting the conference at a time when there had been reports of outbreak of the disease in several parts of the country. At the same time he mentioned the roles international organizations like WHO and UNICEF were playing in the eradication of the disease from his country.

He formally declared the workshop open with an appeal to the participants not to end their deliberations in the conference rooms but to continue in their various countries until the disease is eradicated.

STATEMENTS AND ADDRESSES

DRACUNCULIASIS ERADICATION: THE END OF THE BEGINNING

by

Donald R. HOPKINS, M.D., M.P.H.
Senior Consultant, Global 2000, Inc.
Carter Center, Atlanta, Georgia 30307, USA
14 March 1988

I want first to thank the Government of Ghana for hosting this conference. Thanks are due also to the other co-sponsors: the World Health Organization's Regional Office for Africa, the United States Agency for International Development, and Global 2000, Inc. of the Carter Center. Finally, I want to thank President Jerry Rawlings and President Jimmy Carter for being here. The emphatic statement which your presence signifies is helping to bring attention to this terrible neglected disease from which so many still suffer needlessly.

This second African Regional Meeting on Dracunculiasis marks the end of the beginning of the global campaign to eradicate guinea worm disease. When the time comes to celebrate the eradication of dracunculiasis, this historic meeting will be seen as a watershed. We have come a long way since Niamey:

- Guinea worm is no longer quite so obscure, having last year been the subject of a sixteen page cover story in Nigeria's Pan-African newsweekly, African Concord, of a full page article in the health magazine of the Washington Post, and it was the focus of a Congressional Hearing by the United States House of Representatives' Select Committee on Hunger. The new movie you have just seen is another important step in this process of public enlightenment.
- We have a better sense of the extent of the disease, with new surveys in parts of Sudan, Ethiopia, Mali, Guinea, Pakistan, and Ghana. Teams in an area of Mali found 435 cases where only 23 had been previously reported. Anambra State in Nigeria treated 202 494 cases of guinea worm between November 1986 and March 1987 alone - out of a state population of about 5 million. (This is about twenty times the total cases reported to WHO for all of Africa in 1986).

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- We understand better too the burden guinea worm imposes on agriculture and school attendance, thanks to researchers in Nigeria, where the diminution of rice production alone in one area is over 11%.
- We have much more documentation of the excellent efficacy of health education and household filters in Burkina Faso, where public health scientists reduced incidence from 54%, 37%, and 24% in three villages to zero in only two transmission seasons. Kati village in Togo, and Kankan in Nigeria are two other comparable recent examples. Here however, pride of place must go to India, which began its national guinea worm eradication programme in 1980 and reduced the national total number of cases from 44 819 in 1983 to 22 610 in 1986. One of the seven original endemic states of India, Tamil Nadu, is already free of the disease, and Gujarat should soon be free as well.
- Since national guinea worm eradication programmes also began in Ghana and Pakistan last year with the assistance of Global 2000-BCCI, and since three other Nigerian states have now joined Anambra in establishing state task forces for guinea worm eradication, it is clear that dracunculiasis eradication can no longer be alleged to be merely an obsession of a few fanatics.

Thus, much has been accomplished since the International Drinking Water Supply and Sanitation Decade began in 1981. The tide has turned. We know guinea worm can and will be eradicated. But we still have much to do before we can dance on the grave of this ancient parasite.

Our first task from now is to improve surveillance and reporting of dracunculiasis (Table 1). At the national level, we need first to know where the disease is before we can shut down transmission. Internationally, better reporting and publicizing of that information is the key to mobilizing political and financial support, and to measuring the significance of your achievement once guinea worm is eradicated. Every endemic country should make reporting of dracunculiasis mandatory and report that data regularly to WHO. Failure to do so helps those who believe guinea worm is not a significant problem.

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The second task is for all endemic countries to develop and implement a national plan of action and set a target date for guinea worm elimination (Table 1). If control measures as effective as those described by Dr Guiguemde and his colleagues in three villages of Burkina Faso were immediately placed into effect in all such endemic villages, then it would theoretically be possible to stop guinea worm completely by 1990. Human nature being what it is, however, I do not expect such rapid mobilization. It is entirely reasonable to project though that we could eradicate guinea worm by 1995, at the latest. Such a plan should show what needs to be done, and indicate what the country is already doing for itself. It thus provides an attractive context for requesting outside assistance, as Anambra State in Nigeria has done successfully with Japan, UNICEF, and American Cyanamid, for example. An inventory of projects to provide safe drinking water over the next several years is an important part of such a plan, and health authorities should make the rationale for giving priority to villages where guinea worm is endemic clear to the water supply authorities: endemic villages suffer all the usual harmful effects of unclean drinking water plus the deleterious effects of guinea worm on their health, agriculture, and education. And the villages with guinea worm are only a small fraction of the total number of villages without safe drinking water.

The third task is for bilateral and international donor agencies to help those countries that decide to get rid of guinea worm, particularly those countries which help themselves by reporting cases, developing a plan of action, and budgeting funds for guinea worm control, however meagre. Having done that, the countries deserve help. Burkina Faso, for example, has had an excellent national plan of action for over two years, which it has not been able to implement fully because of lack of external support. If development is your concern, if helping the poorest of the poor in rural areas, if helping farmers help themselves, if helping villages become self-sustaining is your concern, if improving people's health, agriculture, and education is your business, then helping to eradicate dracunculiasis is one of the best investments you can make. Child survival can have no real meaning in an endemic area where guinea worm is still rampant, and neither does primary health care. However, combatting guinea worm is an excellent vehicle for developing both, while immediately rendering a badly needed service.

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Agencies and institutions fall into one of three categories on this issue: those with no interest, those with token interest, and those that take significant action. If development means anything, if primary health care means anything, if child survival means anything, if Health for All means anything, then surely they mean that a child should at least know what clear water looks like, and that he or she shouldn't miss school or be crippled for life by an infection that is as easily preventable as this one is. Surely they mean that farmers should be able to plant and harvest their crops without being crippled by this preventable menace; and that people in affected areas should understand that guinea worm comes from their drinking water, that entering a source of drinking water with a blister or emerging worm is an unneighbourly act, that if they organize themselves they can take effective action against it, and that they can take effective personal protective measures as well.

Guinea worm is vulnerable. Its continued transmission is no longer acceptable or tolerable. We have seen enough of this miserable worm' Unlike many other terrible diseases, dracunculiasis has only a fragile hold on endemic communities. It has no animal reservoir, its prevalence is highly seasonal in most areas, it is only contracted by drinking contaminated water, its distribution is limited and focal, and there are at least three known ways to completely prevent it. What more do we need? For what else are we waiting? For a fraction of the cost of the highly successful Onchocerciasis Control Programme, we can eradicate another disease which has long plagued farming communities in this region and severely hampered development, even though it is also rarely fatal.

Less than three years remain in the Water and Sanitation Decade. The time for action and funding is now, not next year. It has taken seven years to get to this point. If we all do what we should do, and do it quickly, we can eradicate guinea worm by 1995, with benefits to be compounded daily indefinitely thereafter. To summarize, what we need to do is to seek out and report cases of guinea worm disease, develop and implement plans of action to eradicate it, and provide funding for well-planned programmes. Reporting of cases is the key to the other two tasks. Report, report, report'

The status of this campaign will be discussed at the World Health Assembly in Geneva in May. Let there be a chorus of testimony to the guinea worm's horrors, and an even louder chorus of pledges to eradicate it.

The tide has turned. The struggle continues.

Table 1

	GW Reporting Mandatory	GW Reported to WHO (1985-1986)	Active & Surveillance	National + Plan of Action	Inter- ventions*	Eradication Goal	External Assistance
Benin	•			o	o		AID
Burkina Faso	•	•		•	o	1994	
Cameroon	•	•	•	•	•	1993	
Ken.Afr.Rep.							
Chad							
Côte d'Ivoire	•	•	o	•	•	Yes	
Ethiopia	•	•	o				
Gambia							
Ghana	•	•	•	•	•	1993	Global 2000
Guinea							
Kenya							
Mali		•			o		Impact, UNDP
Mauritania					o		
Niger		•		o	o	1995?	UNICEF, Japan, Global 2000
Nigeria				o	o		
Senegal							
Sudan		•			o		UNICEF
Togo	•	•		•	•	Yes	AID, UNICEF, Peace Corps
Uganda	•	•	o	o	o		UNICEF
India	•	•	•	•	•	1990	AID, DANIDA, SIDA
Pakistan	•		•	•	•	1990	Global 2000
Saudi Arabia							
Yemen							

+ o = incomplete or outdated, • = active

* o = pilot or partial, • = national programme

& o = partial, • = national or all endemic areas.

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Table 2

Uncertain status	Dracunculiasis: Established/likely eradication dates					
	1990	1991	1992	1993	1994	1995
CAR	India	Togo		Ghana	Burkina Faso	Nigeria?
Chad	Pakistan					
Ethiopia	Cameroon					
Gambia	Côte d'Ivoire					
Guinea						
Kenya						
Mali						
Mauritania						
Niger						
Senegal						
Sudan						
Uganda						
Saudi Arabia						
Yemen						

CONTROL OF THE GUINEA WORM: AN ESSENTIAL COMPONENT
OF RICE SELF-SUFFICIENCY IN NIGERIA

Carel de ROOY, Chief of Water and Sanitation Section, UNICEF, Lagos

A pilot study, carried out in five weeks between September and December 1987 in the eastern part of Nigeria and costing a total of US \$ 10,000, brought to light the relationship existing between morbidity due to the Guinea worm and rice production.

This study sets out in detail the method and cost of dracunculiasis control and what economic benefits may be reaped from it..

In nine government districts (Local Government Areas) located in four States (Anambra, Cross River, Imo and Benue), a questionnaire survey was carried out; 723 subjects in 87 households replied to a questionnaire containing 40 questions and, in addition, 12 rice cooperatives as well as 36 rice mills replied to a second questionnaire containing 35 questions.

These basic data were extrapolated to 195,000 households (1.6 million inhabitants) in seven government districts in the Anambra, Cross River and Imo States.

It was thus established that for an overall cost of US \$36.2 millions, four types of intervention could be simultaneously conducted in order to eliminate the guinea worm from this region in the next five years.

The strategies proposed are:

- new supplies of drinking water;
- health education with distribution of nylon gauze filters;
- chemical treatment of water holes;
- community education and mobilization.

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In addition, sanitation measures could be added.

The economic benefits resulting from the elimination of the guinea worm in this region are estimated at US \$20 million annually. This represents only the gain brought about by the increase in rice production.

UNICEF, through its water and sanitation programmes being carried out in the Imo and Cross River States, and their extension to similar projects in the Anambra State in early 1988, is supplying supervision and logistic support. UNICEF is working in collaboration with the team of Professor L. D. EDUNGBOLA of the University of Ilorin (Nigeria).

ADDRESS BY PRESIDENT JIMMY CARTER
CARTER CENTRE, ATLANTA, GEORGIA, USA

Thank you Mr Chairman,

Yesterday, I was in Lagos, Nigeria where we had a very well attended press conference with almost as many news reporters as participants in this meeting. One of the reporters asked: "Mr President, you have been the leader of a great nation. Why in the world are you involved in a programme to eliminate guinea worm? It is not reasonable that you would spend your time with such a project". That is a question easily answered. This is a horrible disease for those who suffer from it. In the continent of Africa, each year more than 10 million people are afflicted with this disease. It is a kind of problem that is often overlooked - perhaps even by many in this room.

I have been in several countries to speak with the Prime Minister or the President, or the Secretary or Minister of Health, and found that they are thoroughly unfamiliar with the fact that guinea worm is a prevalent affliction in their country. Quite often the disease is only known in the poorest and most remote of villages and among the people who quite often have no relationship with the central government officials in the capital city.

In Pakistan for instance, where we hope to have success in totally eradicating guinea worm by the year 1990 - in one village only two cases of guinea worm had been reported to the central government. When we did a more thorough inventory there of cases, we found that about 1200 people had been treated locally for this disease in the previous year.

Nigeria has 21 states. In all 21 states, guinea worm is prevalent and about two and a half million Nigerians suffer from this disease each year. This is a conservative estimate based on inadequate reporting to the central government. As has already been pointed out so well, guinea worm has far reaching adverse effects on the economies of nations. In one small area of Nigeria for instance, UNICEF has done a study showing that among a population of one and a half million, \$20 000 000 worth of rice production is lost each year because of guinea worm. This would far exceed the cost of treating the guinea worm problem in the entire country. Such eradication would not only liberate farmers during the planting season from this disease that has been part of their lives for many centuries, but also remove what is a major cause of absenteeism from the schools among the children of the country.

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It is important that this conference and now the commitment of WHO and other organizations to target guinea worm for eradication bring attention to this disease. Obviously, as has been pointed out so well already, the preventive measures are very simple but the implementation of the programme for eradication is not so simple. By drilling deep wells to reach pure water, we know that guinea worm can be eliminated. This is a long range and expensive solution but it is the best of all. There are chemicals available, as you all know, for the treatment of watering places - small ponds or water holes that are used by villagers for drinking purposes. This brings relief as well.

Other procedures are much more feasible in implementation: that is the changing of water taken from an infected water hole or supply into water that is free of the guinea worm larvae. One option of course, is to boil the water but this is not always feasible. Yesterday, we had a very enlightening report from one of the State Ministers of Health in Nigeria who said that the people just simply would not take two or three hours to boil water and wait for it to cool before they drink it when they are thirsty. Also, he said the villagers complain that boiled water does not taste good and there is no way that boiled water will ever be used as a means to eradicate guinea worm. But through a simple education programme based on radio broadcasts, simple posters and brochures, if the people can be taught to strain the water or filter the water through a clean cloth then they find that after a year there is no guinea worm. And one of the most exciting prospects for eradication is that once a cycle is broken for 12 months as you know in a particular village, then the guinea worm will not recur.

It might be wise to point out that another benefit from this Conference and the one held two years ago in Niger is that there is now a coordinated effort with UNDP, with UNICEF, with WHO, with private contributions for focusing on teaching about this disease. This can, I think bear rich dividends very quickly. The awareness by public officials in each country that their people suffer from this disease and it can be eradicated, will bring rich political benefits to the wise leaders of those countries for delivering an effective programme for the well being of their own people. This will obviously contribute to political stability.

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As a former politician myself, I know that when you can implement a programme that is good for your own people it provides for popularity and stability and a sense of accomplishment of the entire country. This is available to the 19 countries in Africa that suffer this affliction on their people. My hope is that not only the Ministers of Health and Secretaries of Health but also that the Presidents and Prime Ministers and other leaders will become deeply involved in this programme that can be very beneficial to them and very popular for them.

There are rich financial dividends to be derived from a minimum expenditure of public funds. The Carter Centre and Global 2000 will maintain our involvement in this programme, although obviously our role will be relatively small. What we can do is always to contribute to the publicity about guinea worm disease and let the leaders of nations know that dracunculiasis is a problem in their country and that it can be alleviated. One of the exciting facets of our own efforts is that a private banking firm, the Bank of Credit and Commerce International has volunteered to provide full funding for the effort that we are making in the Carter Centre against guinea worm through Global 2000. And I think the marshalling of a private contribution of this kind can be pursued by those who need additional financial support. We are fortunate in the Carter Centre to have Dr William Foege as our Executive Director. He was, as you may know, the Director of the Centres for Disease Control that helped to coordinate a few years back the worldwide effort to eradicate smallpox. Lessons from that success are now about to be employed in the next phase to eradicate the second disease targeted by WHO for total worldwide elimination: guinea worm.

I think success in this programme will bear rich dividends in the courage and ambition of health agencies to move then to total eradication of polio, measles, perhaps river blindness, and yaws, because this will indicate that not only is it advantageous, but it is possible through coordinated action to eradicate these endemic diseases from this continent and from others. Finally, I would say that the Guinea Worm Eradication Programme can be joined with similar programmes to increase food production, to improve education, to immunize children against contagious diseases.

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We have working with us also in Ghana, one of the most receptive nations I have even seen and the friendliest nation I have ever visited a wonderful human being. Just two years ago we had 40 farmers involved in increasing production of food grains. Last year we had 200 farmers; this year we will have more than 18 000 Ghanaian farmers who will be participating in increasing their production of food grains. This is through the leadership of Dr Norman Borlaug whom you may remember received a NOBEL PEACE PRIZE in the early 1970s for his work in the Green Revolution in India and Pakistan.

So, the medley of health programmes and agricultural programmes and education programmes and political and economic advancement in nations is a direct benefit from targeted goals such as this that are exciting, that are inspirational and are practical in their achievement. As the head of the Carter Centre, I pledge my full and sustained commitment and participation, in a limited way of course, until the goal of total eradication of guinea worm is achieved.

This is a wonderful opportunity for us to show the world what can be done with cooperation in the field of primary health care and I am grateful to play a small role in the effort that you all have commenced and which will be concluded with success.

Thank you very much.

ADDRESS DELIVERED BY DR G. L. MONEKOSSO
REGIONAL DIRECTOR OF WHO FOR AFRICA

Your Excellency, Flt. Lt. J. J. Rawlings, Chairman of the PNDC and Head of State, Distinguished Guests, Ladies and Gentlemen,

Allow me first of all to thank you for the great honour bestowed upon us by personally attending this opening meeting of the Second Regional Workshop on Dracunculiasis in Africa and by placing this meeting under your illustrious auspices. Your presence is proof of the interest shown by yourself and your government in health development and the control of major endemics of which dracunculiasis is one of the most important. Your presence is also an assurance of success in the battle waged by your country, and all other countries on the African continent where this disease is endemic, against this scourge which is as old as history and which we are seeking to eradicate.

The presence among us of Mr Jimmy Carter, former President of the United States of America and who spearheads his great country's fight against disease, hunger and other disasters afflicting the world at large and delaying or hampering the harmonious development of our peoples, is a guarantee of fruitful collaboration with his organization (Global/2000) and with all those who in one way or the other, contribute towards the fight against guinea worm infection.

I wish to thank the Government and people of Ghana for hosting this workshop in this beautiful and hospitable city of Accra. I also extend my gratitude to international collaborators and friendly governments for providing the necessary support for the battle we are all waging, in our Region, against endemic diseases including dracunculiasis.

Finally, may I take this opportunity to thank you, Mr Chairman of the PNDC for having kindly invited me and my delegation to this country to pay an official visit. Since our arrival we have been overwhelmed by the warm welcome and Ghanaian hospitality which have been extended to us everywhere.

We are assembled here today to follow up the first workshop held in Niamey, Niger, in July 1986. It is with a certain pride that we note that this Second Workshop is held at the place and at the date agreed upon and we congratulate all those who helped to organize it.

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This second workshop is in fact the fourth of a series of national and regional meetings designed to assess dracunculiasis control activities and to prepare and plan control strategies in our Region and throughout the world.

Dracunculiasis or the guinea worm disease is an endemic which still presents a serious risk for the health of villagers in 19 African countries. Although this disease is one of the most ancient parasitic infections known to man, as attested by the old Testament, several factors have caused it to be one of the "forgotten problems of neglected populations".

The guinea worm eradication programme in India, showed that the guinea worm can be eliminated or eradicated, by simple and inexpensive means, through a well-planned and well-organized control programme based on the strategy of integrated primary health care and using basic components such as drinking water supply and health education with voluntary and active community involvement. It must be added that here, on our continent, ad hoc control activities have made it possible to almost entirely eliminate the disease from certain villages.

This leads us to the International Decade of Drinking Water Supply and Sanitation which will come to an end in two years time. Thanks to activities carried out within the framework of the Decade, hundreds of millions of persons now have access to safe drinking water. Dracunculiasis is a water-borne disease and it may only be eradicated by providing all inhabitants, and especially those in rural areas, with a sufficient quantity of safe water. Although significant efforts have been made to provide villages and periurban populations with safe water, much still remains to be done. Let us use the little time left before the Decade draws to an end to come as near as possible to attaining our objective, namely: the eradication of the guinea worm from our continent and from all countries around the world. The first objective of this workshop is to assess progress made in implementing recommendations by the workshop held in Niamey, Niger, in July 1986. These recommendations were addressed to the governments of countries affected by dracunculiasis, to international organizations within the United Nations system, to governmental and nongovernmental bodies as well as to donor agencies. It is therefore very important to examine and analyze, first of all, what we have accomplished with regard to these recommendations. I am convinced that this will be done with the greatest objectivity and frankness.

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The second objective will be to examine the current status of dracunculiasis in the countries from the standpoint of distribution, prevalence, monitoring, control and socioeconomic impact. These data are extremely important as without them it will not at all be possible to formulate and implement a coherent control programme.

The third objective consists in reviewing the current status of guinea worm control projects as a part of primary health care and water supply and sanitation projects. A few countries have already formulated and implemented programmes and/or plans of action for controlling this disease. An examination of these programmes and plans of action, as well as of their state of progress, will enable us to analyse the extent to which they have been successful and what are their weak points. These activities will be beneficial for the countries concerned and those countries which have lagged behind.

The fourth objective consists in seeking to facilitate the formulation, implementation or strengthening of national plans of action in all African countries where the disease is endemic. During this workshop, the participants of 19 endemic countries which have not yet reformulated a plan of action, may do so at the end of the technical discussions.

Indeed, the main objective of this workshop is, as far as possible, to achieve full success in its endeavour. This workshop will help us to mobilize public opinion and the international community with a view to obtaining more substantial assistance for dracunculiasis control projects as well as project formulation and implementation.

Although dracunculiasis is in theory easily eradicated, experience has shown that this is not the case in actual practice. We must be equal to this task and, at a time when we are celebrating three anniversaries which are of the utmost importance for the World Health Organization, namely the fortieth anniversary of WHO, the tenth anniversary of smallpox eradication and the tenth anniversary of Alma-Ata, we must all be totally committed and make every effort in our countries, with the support of national and international organizations, so that, by 1990, all endemic countries may have launched national dracunculiasis control programmes and that by 1995, more than a half of endemic regions in our continent may be completely free of this handicapping disease.

Your Excellency, ladies and gentlemen, it is our hope and conviction that the findings of this workshop starting today will be very important for attaining these objectives. In this context may I therefore wish all participants very fruitful deliberations.

ANNEX 12

SPEECH DELIVERED BY MR. JUSTICE D.F. ANNAN, MEMBER OF THE
PEOPLE'S NATIONAL DEFENCE COUNCIL (PNDC)

Mr Chairman, Mr President and Mrs Carter, PNDC Members,
Secretaries of State, WHO Regional Director for Africa,
Excellencies, Distinguished Guests, Ladies and Gentlemen,

It is a great honour and a privilege for us in Ghana to host this second regional workshop on guinea worm in Africa. On behalf of the PNDC and the people of Ghana and on my own behalf I take this opportunity to bid all our distinguished guests a hearty welcome to this country.

Mr Chairman, I consider this conference an extremely important one because guinea worm is basically a disease of rural dwellers, and we all know that our rural communities constitute about 70% or more of our population. We are therefore talking about a problem that is potentially a threat to the well-being of the majority of our peoples.

As we all know, this is the second such workshop on this very important health problem, the first having been held in Niamey, Niger in 1986. I wish to congratulate the organizers of these workshops for drawing the attention of the international community to this very crucial problem even if belatedly. It is indeed encouraging that there is now a growing domestic and international concern about the plight of our rural poor. I see this concerted effort on guinea worm control in Africa as an important example of the kind of action that we must take together to address the plethora of problems of our rural dwellers. I am referring, Mr Chairman, not only to the problem of poor water supply, but also to poor infrastructural development.

Even to such an audience as you are, Mr Chairman, it is I think still necessary for me to reiterate that guinea worm is technically a very simple disease in terms of the life cycle of the causative organism as well as strategies for prevention. Its social and economic consequences however are anything but simple.

We are all too familiar with the characteristic picture of whole rural communities being stricken by this disease, and farming and other economic activities being brought to a stand still as a result. We know its effect on children's education because affected children are unable to attend school regularly. These are some of the stark realities of the guinea worm problem. We all know, Mr Chairman, that the guinea worm

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afflicts our rural brothers and sisters who do not have safe and reliable sources of drinking water: the very people who produce the bulk of our national wealth. Mr Chairman, one may well ask: Why have our nations and the international community taken so long to respond to the social and developmental needs of rural communities in the developing world? Policy initiatives have not been matched by firm action programmes. Be that as it may, Mr Chairman, I am happy that this international workshop on guinea worm in Africa is taking place today. It is an indication of growing international awareness and concern about this fairly common but crippling disease. It is my fervent hope that at the end of this workshop you will define concrete action programmes that would emphasize the overriding need for concrete support from national and international sources.

Given the financial and other constraints that our countries are struggling with in these difficult years of economic recovery and structural adjustment, it is of crucial importance that the case for additional funds targeted to the mitigation of the social cost of these economic programmes be loudly and clearly stated. Such additional funds must necessarily come from international sources and without the conventional conditions that characterize loans and facilities that service the programmes and projects of mainstream recovery and adjustment.

In Ghana we have recently launched a programme of action to mitigate the social cost of adjustment which has attracted additional international funding. I invite you to find some time to take a look at our documents.

Mr Chairman, please permit me at this juncture to acknowledge with gratitude the personal interest and involvement of our friend President Jimmy Carter in the establishment of Global 2000 which seeks to address the basic needs of rural communities, including guinea worm control, in developing countries. We are also grateful to Mr Sasakawa of Japan, and Mr Argah Abed of Pakistan, two dedicated international philanthropists who are providing financial support for the work of Global 2000. Mr Chairman, Distinguished Ladies and Gentlemen, you will all agree with me that the efforts of these three dedicated and conscientious humanists and their staff deserve our wholehearted commendation.

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In this connection, I wish to recall the visit to Ghana in July 1986 by President Carter and his dedicated, humanitarian team to inaugurate Global 2000 projects in this country. On that occasion Mr Chairman, we restated our keen awareness of the benefits and blessings of peace. That is why we cherish and will continue to cherish the International Peace Foundation and will endeavour to assist in promoting its aims and objectives. We pledged on that occasion, that at an appropriate time and place, the Government of Ghana will actively work, in concert with other Governments and all men of goodwill everywhere, for Global 2000 to be given the international recognition that is rightly its due. We stand by that commitment, Mr Chairman, and I am happy to restate it today.

It must be obvious to all of us however that the unparalleled generosity of these philanthropists must be complemented by national effort. This is essential. The resources required for effective solution of the problems of our communities are enormous. They are beyond our capabilities as developing countries. The need therefore for the developed countries to join us in this endeavour is greater now than ever before. We invite them to join us in this grand human enterprise. Let us be partners in world development.

Mr Chairman, I am informed that a decade ago you started talking about primary health care, the international response was immense. The hope of the third world that international assistance would flow easily was high. However, when one looks carefully at the performance of the developed countries generally today, one realises that their deeds have fallen short of our expectations. This naturally leads us to consider the general problems of under-development. But it is impossible to discuss the problem of under-development without making reference to the New International Economic Order. When the producers of raw materials which support the factories of the industries of the industrialized nations do not have the means to satisfy their own basic needs, then we all have a moral obligation to appeal most earnestly to the conscience of the developed countries. I would like to suggest to you that one of the out-puts of this workshop should be a resolution calling for massive international assistance not only for the control of the guinea worm but also for primary health care in developing countries.

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For us in his country, this workshop could not have been held at a better time for, in recent weeks, there have been several cases of outbreak of guinea worm in many parts of Ghana. Besides, we are extremely fortunate to have the assistance of Global 2000 and indeed of a few other international agencies like WHO and UNICEF who are committed to the total eradication of guinea worm from Ghana. We are presently gathering information about the prevalence of the disease. The Northern Region has already completed a prevalence survey and time permitting, you will be able to learn about the disease in that region which is probably the worst affected in the country.

Mr Chairman, Distinguished Ladies and Gentlemen, you will no doubt be exchanging views and experiences regarding the control of guinea worm in your various countries. Your discussions should include an exchange of experiences in health education strategies used in the control programmes in your countries. I hope that the cross fertilization of ideas will not end in this conference room but will lead to follow-up visits to model control areas. I understand that in the case of bilharzia control, Egypt once had a model control programme which attracted experts from many countries.

Finally, Mr Chairman, President and Mrs Carter, PNDC Members, Secretaries of States, Excellencies, Distinguished Guests, Ladies and Gentlemen, I would like once again to extend to our guests a most hearty welcome to Ghana, and wish you all very fruitful deliberations. I now have the singular privilege to declare formally open this 2nd International Workshop on guinea worm in Africa.

Thank you.