

DRACUNCULIASIS ERADICATION: AND NOW, SUDAN

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Abstract. This paper summarizes the status of the global dracunculiasis eradication campaign as of early 2002. Of the 20 countries that were endemic when the campaign began, seven have already interrupted transmission, four countries reported less than 100 cases each, and only five countries reported more than 1,000 cases each in 2001. Only 14,000 cases

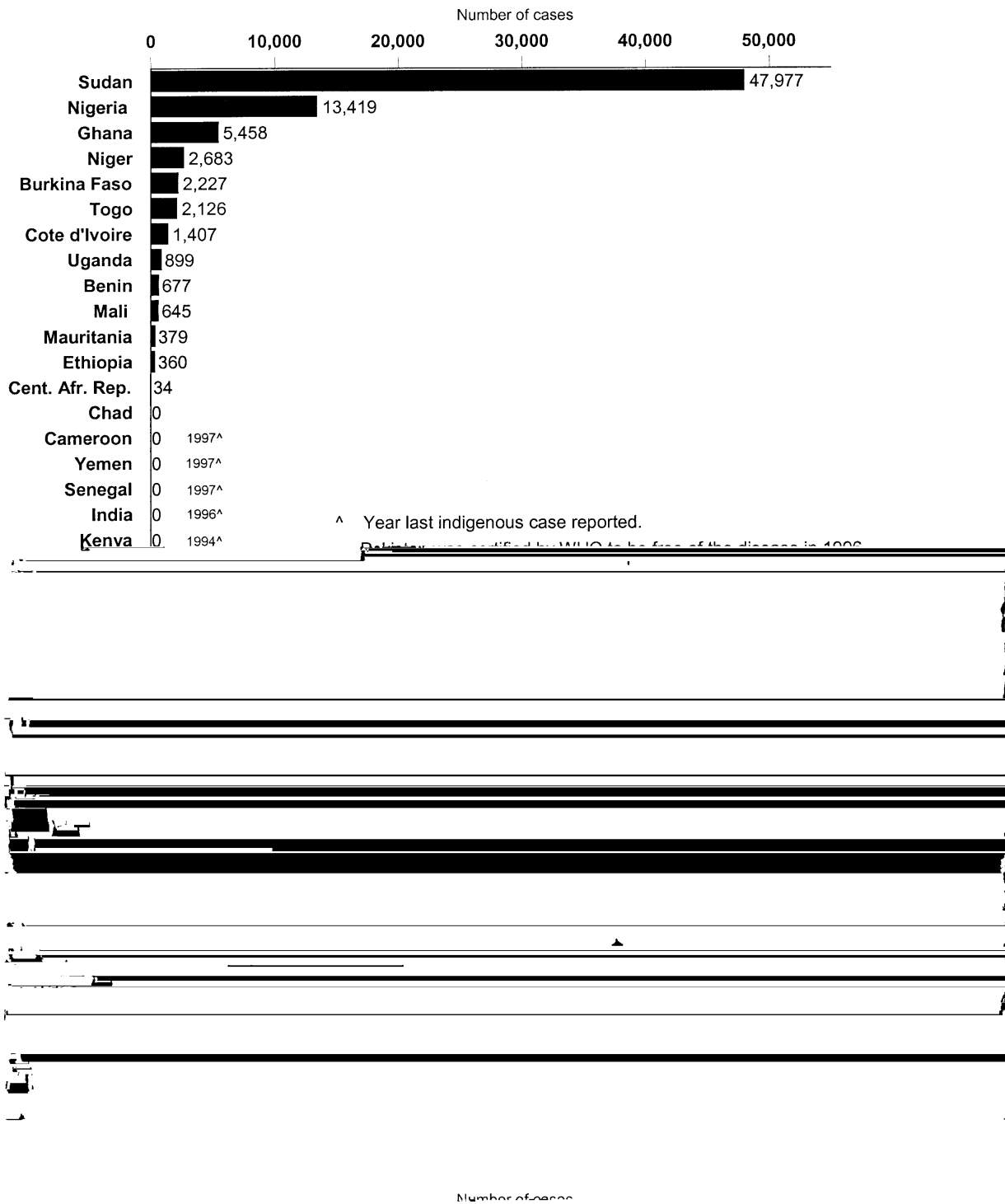


FIGURE 1. Distribution by country of 78,293 indigenous cases of dracunculiasis r

2000, examined three persons who had been diagnosed as dracunculiasis, but whose worms were later identified at CDC as *Onchocerca volvulus*.⁶

A total of 108 cases were reportedly exported from one country to another during 2001. Of these, Sudan exported 31, Ghana 17, Togo 17, Niger 11, Nigeria 11, Mali 5, Burkina Faso 5, Cote d'Ivoire 4, and Benin 3. Two alleged imported cases in the Central African Republic may also have come from Sudan.

The status of interventions as of the end of 2001 in all endemic countries except the Central African Republic is summarized in Table 1. Programs are now monitoring the status of these interventions much more closely than before, in addition to tracking the monthly reductions in cases reported compared with the previous year. Line-listings of endemic villages or districts, ranked in order of decreasing level of endemicity, are used to forecast the onset and duration of transmission in specific villages or geographic areas, and to

SUDAN

In our previous review, we reported that “Sudan remains the major challenge to eradication.”¹ That is even truer now, but it is the war that is the greatest obstacle, not the country itself. Since former U.S. President Jimmy Carter negotiated a four-month “Guinea Worm Cease-Fire”, which allowed Sudan’s eradication program to escalate its efforts in 1995, Sudan has reported 50% or more of all cases of dracunculiasis each year. Sudan’s proportion of global dracunculiasis cases has steadily increased over the past seven years as cases are reduced in all other endemic countries. As shown in 1’lnyy1%wlinby1%w
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monitor the status of interventions. Programs in Burkina Faso, Cote d’Ivoire, Ghana, Niger, Nigeria, and Togo are implementing “Worm Weeks”, which are 5–7 days of intensive health education and community mobilization, during which U.S. and sometimes Japanese Peace Corps Volunteers or former volunteers live in endemic villages with national counterparts of the country concerned. During that week, they talk with villagers about how to prevent dracunculiasis, put on plays, arrange public ceremonies with prominent officials, help dig wells, distribute and demonstrate how to use cloth filters, and carry out other activities. A study of the impact of such Worm Weeks in Ghana in 2000 found an 80% reduction in cases the following year in villages that had had Worm Weeks, compared with an average reduction of 45% in nearby communities that only had the usual interventions. Several programs are now using specially constructed containment houses and/or existing medical facilities to temporarily isolate persons while their worms are emerging. The amount of technical assistance provided by external workers (including many former Peace Corps Volunteers), to assist field supervision in endemic countries, has risen from 18 person-months in 1998, to 28, 88, and 164 person-months in 1999, 2000, and 2001, respectively. In December 2001, the Voice of America began broadcasting Public Service Announcements (by former U.S. President Jimmy Carter, former Malian head of state General Amadou Toumani Toure, and former Nigerian head of state General [Dr.] Yakubu Gowon) containing messages about dracunculiasis prevention in English, French, and Hausa as a part of its programming in Africa. These same messages are now being retransmitted via local radio stations using local dialects in many of the endemic countries.

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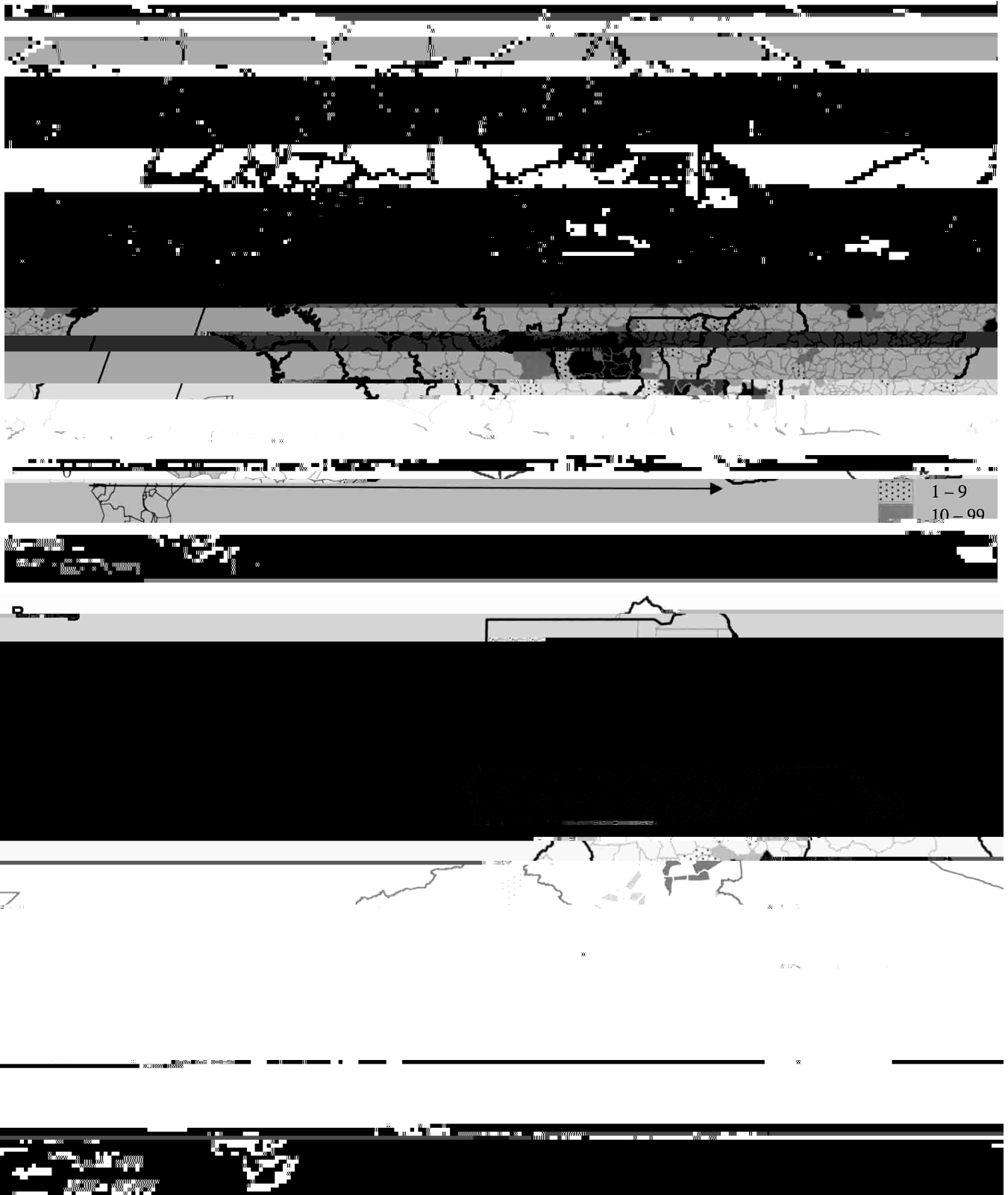


FIGURE 3. **A**, Distribution of 14,112 cases of dracunculiasis in western Africa, 2001. **B**, Distribution of 49,591 cases of dracunculiasis in Sudan, Uganda, the Central African Republic, and Ethiopia, 2001.

TABLE 1
Dracunculiasis eradication campaign: status of interventions as of December 31, 2001*

Country	Number of cases reported in
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fixed over one end, and a string through the other end to allow the owner to wear it around his/her neck constantly, and thus have a filter that they can use like a straw to drink filtered water when farming or traveling away from home. This special intervention was initiated by the Norwegian founder of Health and Development International (HDI), who persuaded Norwegian workers at Hydro Polymers of Norsk Hydro and the Norwegian Chemical Workers Union to donate PVC pipe for the project, and mobilized additional support for the project from the Government of Norway, Norwegian Church Aid (NCA), and The Carter Center, as well as HDI itself. Some 9.2 million pipe filters were assembled in Nairobi by a group of more than 1,000 Sudanese, Ethiopian, and Kenyan workers. The Carter Center and NCA coordinated implementation of the project, the impact of which will be evaluated in 2002.

The Sudan Guinea Worm Eradication Program and its partners have also worked hard to increase other interventions, despite the constraints imposed by the war. Between 2000 and 2001, for example, the percentage of known endemic villages with a village-based health worker who has been trained to help prevent dracunculiasis increased from 54% of 7,898 villages in 2000 to 84% of 6,040 villages in 2001. Similar improvements were achieved in the same period in the rate of monthly reporting of cases (from 39% to 66%), provision of health education about the disease (from 54% to 85%), availability of cloth filters in all of a village's households (from 28% to 62%), and availability of at least one source of safe drinking water (from 45% to 61%). Only use of Abate for vector control decreased, from 3% to 2% over that year. Meanwhile, the data management system of the program in Sudan is the envy of some countries that are not at war. A special effort began in 2001 to intensify interventions, especially in two southern states that are relatively stable, being mostly controlled entirely by the opponents to the government, namely West Equatoria and Lakes (Buheirat).

Representatives of all 13 endemic countries convened in Khartoum on March 4–7, 2002 for the Seventh Meeting of Program Managers of Guinea Worm Eradication Programs. This annual meeting, the venue of which rotates among the

endemic countries, was co-sponsored by the Government of Sudan, The Carter Center, UNICEF, and WHO. The choice of Sudan for this year's meeting was intended to help focus Sudanese and international attention on Sudan's overwhelming share of the world's remaining cases of dracunculiasis, to publicize the fact that dracunculiasis eradication cannot be completed without an end to the 19-year war in Sudan, to help mobilize the other endemic countries for their final push towards eradication, and provide an opportunity for political discussions related to the Sudanese civil war. It succeeded in all four objectives. The Sudanese head of state, General Omar Al-Bashir, presided over the Opening Ceremony, which was attended by more than 1,000 persons, and also featured remarks by former U.S. President Jimmy Carter, former Nigerian head of state General (Dr.) Yakubu Gowon, and the Federal Minister of Health of Sudan. President Bashir unveiled three commemorative postage stamps in honor of the occasion (Figure 5). The conference generated massive national and international publicity by radio, television, newspapers, and the Internet before, during, and after the meeting itself. More than 10 ministers or deputy ministers of health or their representatives, including a few from formerly endemic countries, participated in a two-hour Round Table Meeting organized by WHO and adopted a Khartoum Declaration committing themselves to completing eradication as soon as possible.⁷ This meeting also inaugurated a new format in which the national program managers gave more detailed written and verbal reports, describing separately the epidemiology of the disease in their country, the status of each intervention during 2001, and plans to intensify interventions during 2002. After leaving the conference, President Carter visited an area of southern Sudan controlled by the rebel forces (the Sudanese People's Liberation Movement [SPLM]), held discussions with other political leaders, and met the head of the SPLM, Dr. John Garang, at The Carter Center two weeks later.

DISCUSSION

After only modest reduction of cases outside Sudan between 1996 and 1999, the global campaign regained momen-

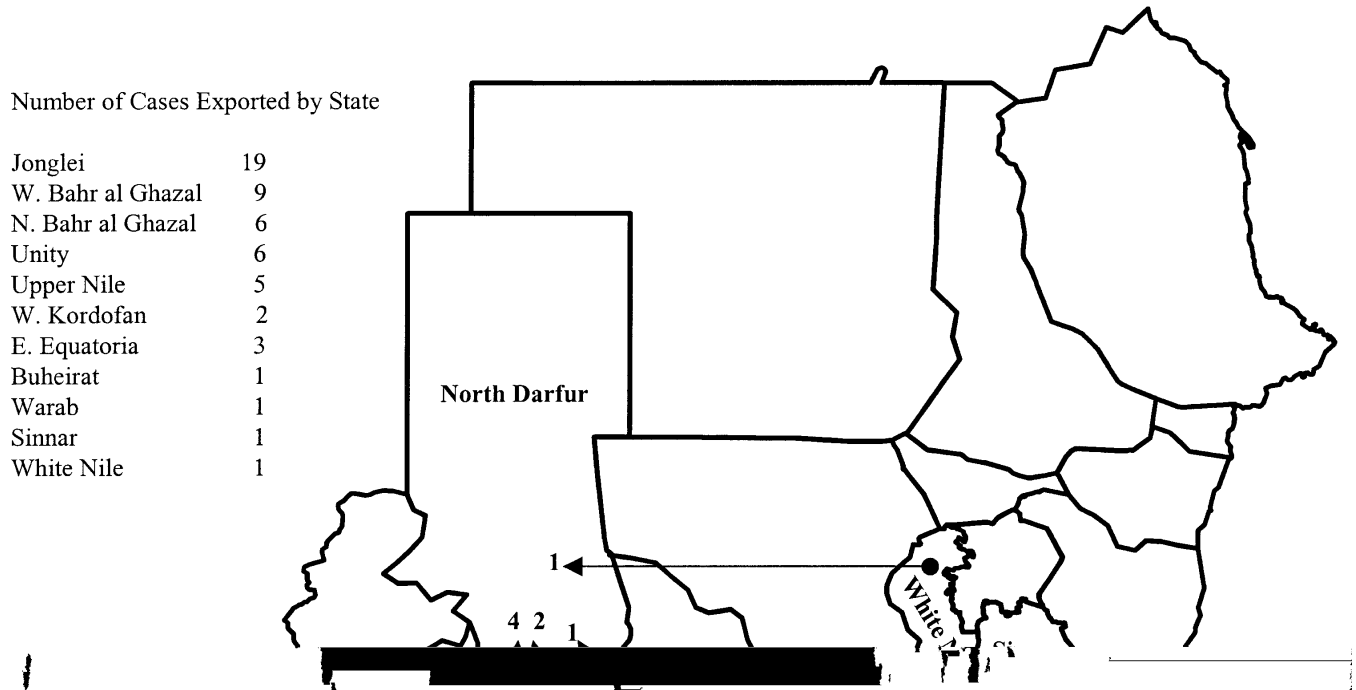


FIGURE 4. Exportation of cases of dracunculiasis in Sudan by state, 2001. C.A.R. Central African Republic.

tum in 2000 and is now accelerating towards zero cases. The current strategy is to complete eradication outside Sudan as quickly as possible, then turn full attention to finishing off the disease in Sudan. The speed and success of reaching the goal outside Sudan will depend on how well national programs, national political leaders, and village volunteers execute what

needs to be done, as well as on the technical and financial assistance provided by external supporters.

We believe that at least four or five years will be required to completely eradicate dracunculiasis from Sudan, even after the war ends, because of the high level of endemicity, the vast size and geographic barriers in southern Sudan, and the poor

infrastructure there. In the meantime, recently increased global attention to helping to find a political solution to the complex war in Sudan is welcome and timely, since achieving a political settlement will be difficult and take time, and the other endemic countries are all very close to finally interrupting transmission of the disease. One tangible epidemiologic gain from the recent diplomatic activity has been access by health workers from the Sudan Guinea Worm Eradication Program to the contested Nuba Mountains area (in South Kordofan State), which was previously highly endemic but inaccessible to health workers for more than a decade. The survey teams found that almost no cases of the disease remain there. The Carter Center and CDC are also continuing to search for any antihelmintic drug(s) or antibiotic that could prevent or cure dracunculiasis to shorten the time needed to interrupt transmission in Sudan when peace does come there.

Reasons for the plateau in cases in the late 1990s, which has delayed attainment of eradication, include political instability and war, inadequate funding, complacency, and apathy. Even outside Sudan, political and ethnic conflicts have significantly impeded program activities in Central African Republic, Ethiopia, Ghana, Mali, Nigeria, Togo, and Uganda in recent years. The problem of inadequate funding was removed as an important constraint by a major grant of \$28.5 million from the Bill and Melinda Gates Foundation to The Carter Center, WHO, and The World Bank, beginning in 2000. Under the division of labor agreed for in that grant, The Carter Center has lead responsibility for assisting programs in countries reporting more than 100 cases annually, WHO has lead responsibility for countries with fewer than 100 cases annually as well as for activities related to pre-certification and certification of eradication, and UNICEF focuses on assisting selected endemic countries with funds from other sources, with an emphasis on helping to provide safe drinking water to affected communities. The Gates grant is administered through The World Bank by a committee of representatives from WHO, The Carter Center, UNICEF, and the Bank.

Complacency and apathy by health workers in endemic countries and by representatives of some national and international agencies has become harder to avoid, especially as the end of the campaign has been delayed. Recruitment of the popular former Nigerian head of state, General Gowon, to the campaign made an immediate and significant difference in

that important country, in addition to personnel changes, better funding, increased technical assistance, and strong support by the new head of state. Beginning in 1999, General Gowon has visited endemic villages in all of the major endemic foci remaining in Nigeria, engaging political and public health leaders, extracting promises of action and re-visiting to check

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