Am. J. Trop. Med. Hyg., 52(1), 1995, pp. 14–20

DRACUNCULIASIS ERADICATION: MARCH 1994 UPDATE

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Abstract. Substantial progress has been realized in the global campaign to eradicate dracunculiasis by the end of 1995 since a previous review of the subject was published in this journal a year ago. All known endemic countries are now engaged in the eradication effort, and one or more control measures are now in place in 93% of endemic villages. Despite improved surveillance for the disease, the number of reported cases of the disease has been reduced by 41% (to about 221,000), and the number of known endemic villages has been reduced by 28% (to about 16,500) in the past year. Priorities for national eradication programs in 1994 include increasing the use of vector control and intensifying the case containment strategy in endemic villages. It is still possible to achieve the eradication target of December 1995, but greatly intensified efforts this year will be required to do so.

This paper summarizes the status of the campaign to eradicate dracunculiasis (Guinea worm disease) as of March 1994. It is an update of the review that was published in this journal a year ago, and is based on reports presented at the Fifth African Regional Conference on Dracunculiasis Eradication, which met in Ouagadougou, Burkina Faso, March 29–31, 1994.[1] Some of the information reported here was included in the Annual Surveillance Summary for 1993 published by the World Health Organization in April 1994.[2]

Dracunculiasis still occurs sporadically among rural populations in parts of India, Pakistan, and 16 African countries. The disease, caused by the parasite *Dracunculus medinensis*, is transmitted when humans drink water containing tiny copepods (water fleas) that have been infected by larvae introduced into the water when previous victims entered the stagnant water source. Infected persons suffer no symptoms until a year later, when the adult female worm(s) emerge from the body, directly through the skin. No curative treatment or vaccine exists to combat the infection, which may however be prevented completely by providing affected populations with safe sources of drinking water (e.g., from borehole wells), by teaching persons at risk not to enter sources of drinking water when an adult worm is

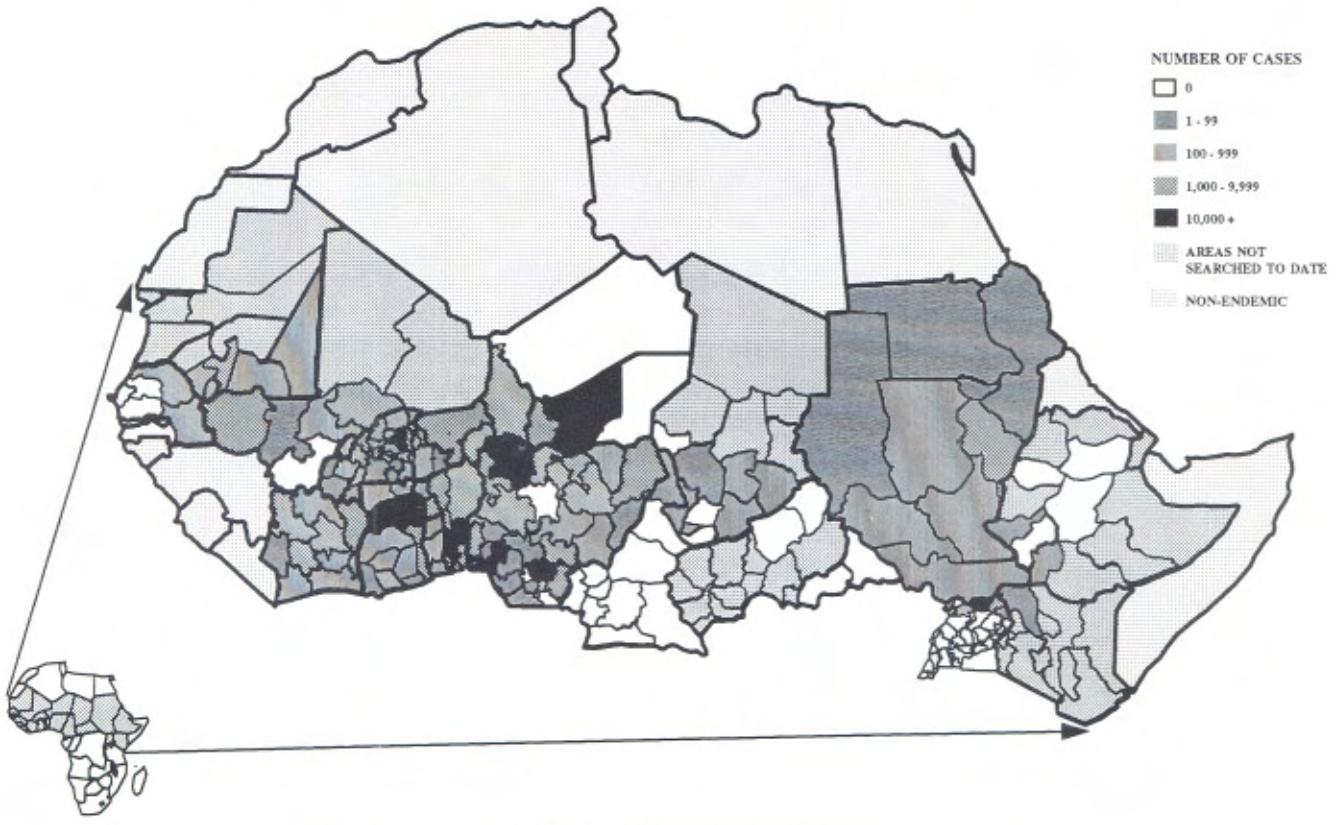

FIGURE 1. Number of reported cases of dracunculiasis in Africa, 1991–1993.

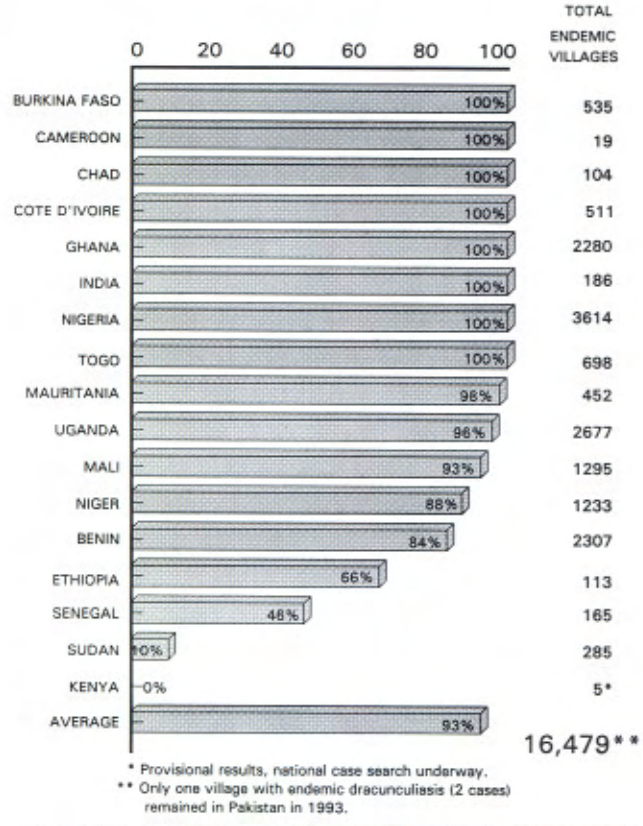

FIGURE 2. Percentage of villages with endemic dracunculiasis having one or more control interventions, March 1994.

emerging or about to emerge, by teaching persons in affected communities to boil their drinking water or to filter it through a finely woven cloth, or by applying a chemical, temephos (Abate®; American Cyanamid, Wayne, NJ), to potentially contaminated water sources at four-week intervals during the transmission season.

Although dracunculiasis is rarely fatal, its considerable socioeconomic significance in endemic areas derives from the fact that the painful, prolonged emergence of the worm can cause large percentages of village populations to be temporarily disabled, and thus unable to attend school, to farm, or to perform other vital family and household duties for weeks or months. Moreover, victims are often infected year after year, since previous infections confer no immunity. Affected villages are usually found in the most isolated and remote areas of a country, areas that most commonly are not accessible to primary health care services even if affected persons could walk.

Current status of the campaign and impact on the disease. Although less than two years now remain before the target date (December 1995) for eradicating dracunculiasis, much progress has been made in the year since March 1993. For the first time, all of the known endemic countries are actively engaged in the eradication campaign, and all but Kenya, which apparently has only a small endemic area, have essentially completed their national searches to ascertain the extent of the disease (Figure 1). Of the remaining known endemic villages, one or more interventions (trained village-based health worker, health

TABLE 1

*Number of cases of dracunculiasis and number of villages affected during 1992–1993**

Country	No. of cases		No. of affected villages	
	1992	1993	1992	1993
Nigeria	183,169†	75,752†	4,087	3,614
Uganda	126,369‡	42,852†	2,677	2,677
Ghana	33,464‡	17,918†	4,908	2,280
Burkina Faso	11,784	8,281†	2,621	535
Togo	8,179†	10,394†	581	698
Benin	4,315	13,887	3,762	2,307
Sudan	2,447‡	2,984	–	285
Mauritania	1,557	3,533	511	452
India	1,081§	755§	576	186
Senegal	728	630†	79	165
Niger	500	21,564	1,157	1,233
Ethiopia	303‡	1,120‡	–	113
Chad	156‡	1,231	–	105
Cameroon	127†	72†	32	19
Pakistan	23†	2†	7	1
Cote d'Ivoire	–	8,034‡	503	511
Mali	–	12,011	1,230	1,285
Kenya	–	35‡	–	5
Total	374,202	221,055	22,731	16,471

* Countries are arranged in descending order of cases in 1992. Data were obtained from passive reporting and/or area-limited searches unless otherwise indicated. – = data not available.
† Village-based reporting of cases.
‡ Provisional reports, national case search underway.
§ Three annual case searches and interim case reports.

education, use of cloth filters, safe water supply, and/or vector control) are in place in at least 93% (Figure 2). The coverage by specific interventions in each of the endemic countries of Africa is illustrated in Figure 3, which may be contrasted with the comparable figure of one year ago.[1] Whereas at previous annual meetings in March, leaders of national programs were often unable to report the numbers of cases that had occurred in their country in the most recent calendar year, at the meeting in March 1994, 11 of the 16 affected African countries reported monthly surveillance data through January 1994, and nine of them reported data through February 1994 (Table 1 and Figure 4).

More important evidence of progress towards the goal of eradicating dracunculiasis by the end of 1995 is the reduction by 75% in the number of cases reported globally between 1989 and 1993, and by 41% in the past year alone, despite on-going improvements in surveillance for the disease (Figure 5). Between March 1993 and March 1994, the number of known endemic villages has been reduced by about 28%, from 23,000 villages to 16,500.

English-speaking West Africa. Among the endemic states of West Africa, Ghana and Nigeria, which formerly were the two most highly endemic countries, reduced their total numbers of reported cases by about 90% between 1989 and 1993. These two countries reduced their combined total of reported cases by 56.7%, and the number of endemic villages by 34.4% between 1992 and 1993 (Table 1).

French-speaking West Africa. Among the French-speaking countries with endemic disease, Chad, Cote d'Ivoire, and Mali have made the greatest improvements over the past year, followed by Benin, Mauritania, and Niger (Figure 3). Much of the increased mobilization in Francophone Africa is due to the efforts of former Malian head

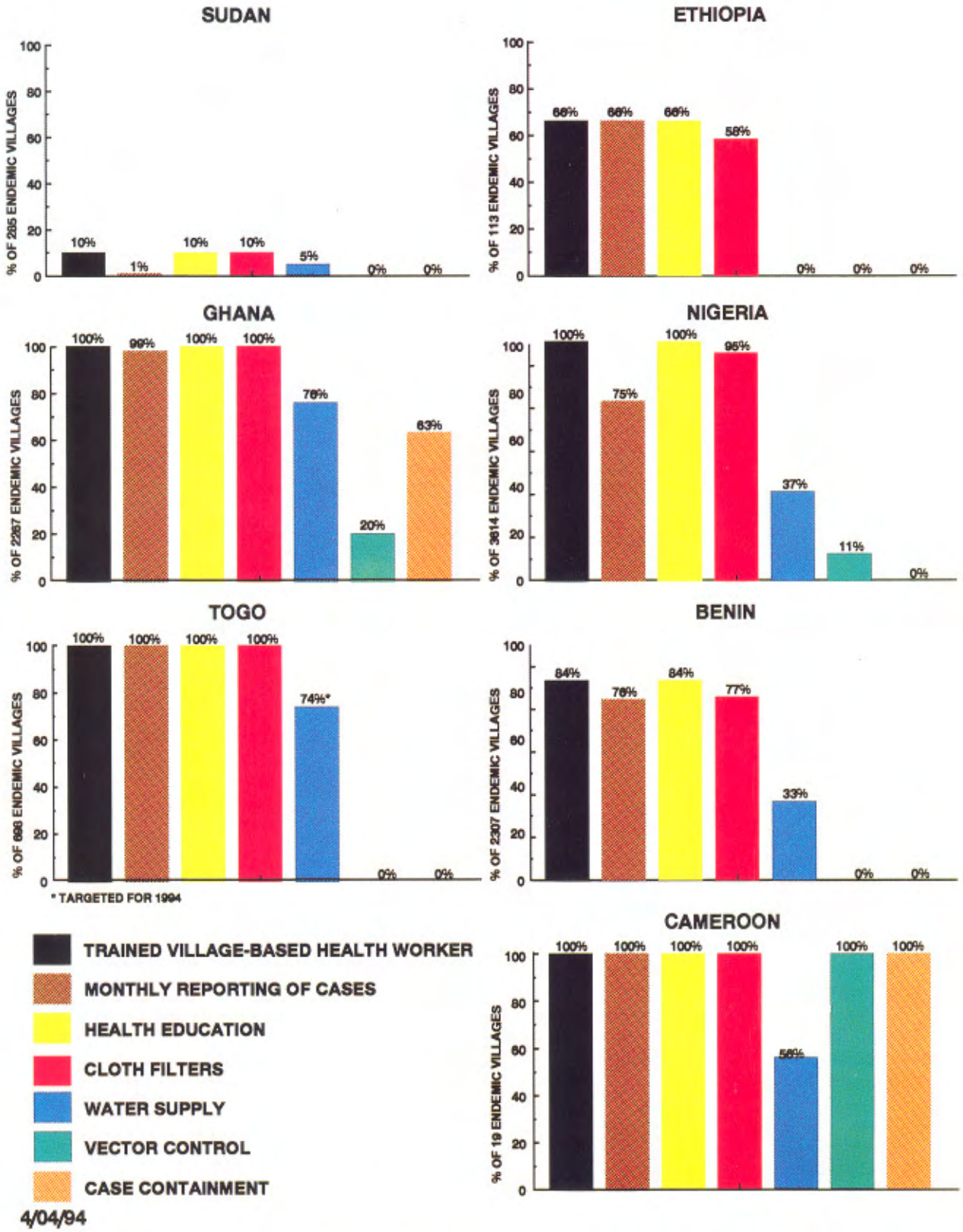

FIGURE 3. Status of interventions by country in Africa, March 1994.

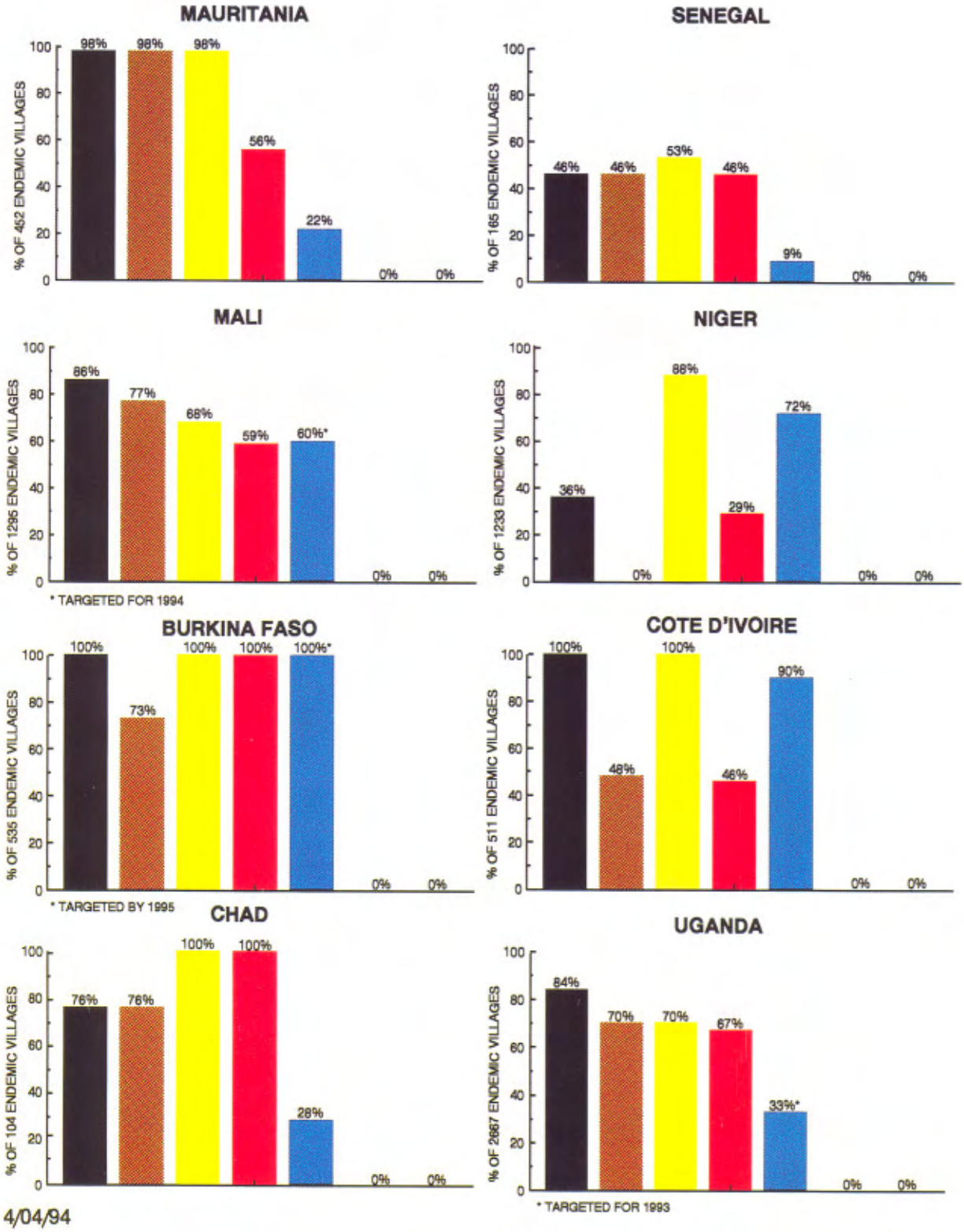

FIGURE 3. Continued.

of state General Amadou Toumani Toure, president of the intersectorial group for dracunculiasis eradication in Mali, who visited several neighboring countries to promote the eradication campaign with governmental leaders, in addition to undertaking several tours of endemic villages in his own country. In these countries, the number of cases reported almost tripled between 1992 and 1993, primarily because of improvements in surveillance of cases during

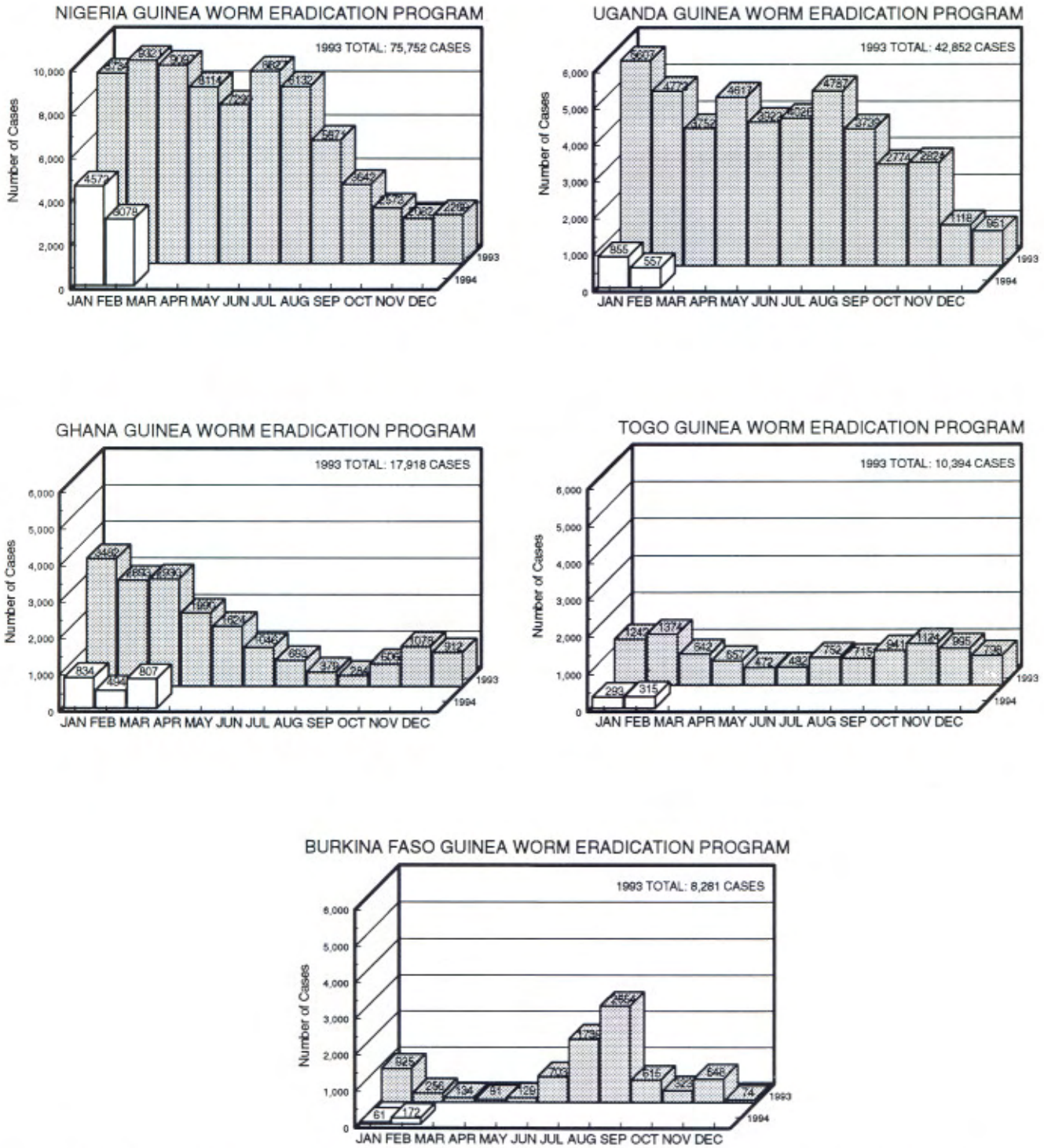

FIGURE 4. Number of cases of dracunculiasis reported in Nigeria, Uganda, Ghana, Togo, and Burkina Faso, 1993–1994.

1993, following a lull immediately after the national searches for cases in 1990–1992. The number of endemic villages decreased 16.8% between 1992 and 1993 (Table 1).

East Africa. In this subregion, combined efforts by the Sudanese government, the United Nations Children's Fund (UNICEF's) Operation Lifeline Sudan, several nongovernmental organizations, and others are expected to result in implementation of control measures in most known endemic villages throughout that country, despite the civil war. The goal is to begin implementation of control interventions during April 1994, before this year's peak transmission season begins. Uganda realized a substantial reduction in reported cases in the past year, and Ethiopia is now intervening aggressively in its limited endemic areas. Uganda experienced a reduction of 65.3% in the number of cases

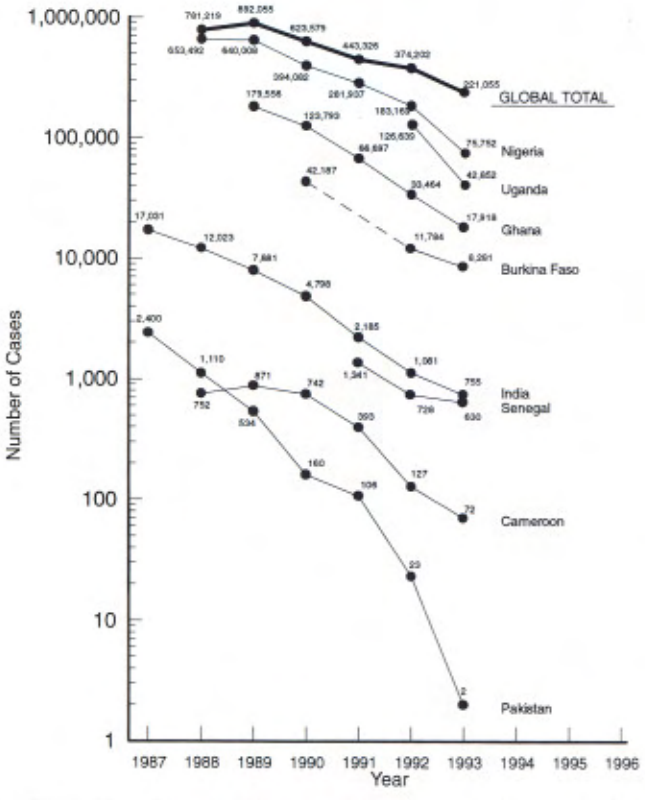

FIGURE 5. Decrease in the number of cases of dracunculiasis, 1987–1993.

reported between 1992 and 1993 (Table 1). The number of cases and affected villages in Ethiopia increased between 1992 and 1993 as a result of the improvements in surveillance for dracunculiasis. During 1993, only 35 cases of dracunculiasis were detected in Kenya. Very little change in numbers of cases and affected villages were recorded in Sudan between 1992 and 1993 due to difficulties, created by the civil war, in implementing surveillance and control interventions in all known affected areas.

Asia. Pakistan detected only two cases in 1993, both in the same previously known endemic village, and thus may have already diagnosed its last case. The rate of decrease in the number of cases in India (30.2%) between 1992 and 1993 was not as large as expected; however, achievement of the goal of zero case of dracunculiasis in India by the end of 1995 is anticipated (Figure 5). India reduced its number of endemic villages by 25.3% between 1992 and 1993. Currently, the main area of concern in Asia is Yemen, where a World Health Organization (WHO) team reported strong rumors, but no conclusive evidence, of continued transmission of dracunculiasis during a visit in May 1993. A follow-up mission by UNICEF and the Centers for Disease Control and Prevention was scheduled for mid-1994.

DISCUSSION

The increasing momentum in the run-up to the target date of December 1995 is manifest in the fact that even the information in this update will soon be outpaced by developments in the dracunculiasis eradication campaign. Two of the three highest priorities for action in 1993 that were described a year ago (increased interventions, completion of national case searches) have been essentially achieved, while the third, implementation of vector control by means of Abate,® is just beginning in most areas.[1] Of the three most serious obstacles that were described in 1993, i.e., the civil war in Sudan, the continued apathy and lack of urgency of some national and international health officials, and the chronic underfunding of this eradication effort, the war in southern Sudan continues, although some control measures are now beginning there. Enthusiasm and urgency are increasing among many national and international health officials as imminent victory more clearly comes into view. Funding for completion of the campaign is also improved, but is not yet fully assured. At this critical stage of the campaign, timeliness of additional funding i.e., monies that could be used during 1994 to help national programs to implement surveillance and control interventions, is more critical than equal or large amounts made available when there is less time to achieve the goal of eradication.

Major challenges for the program in 1994 will be to 1) implement use of vector control in selected endemic villages, e.g., where disease incidence is high, where case containment is being implemented, or where provision of safe water is not feasible or forthcoming, 2) develop a capacity in each affected village to detect all cases very rapidly (before or within 24 hr of worm emergence) and to manage each patient so as to prevent infection of others in the community, and 3) increase the levels of public mobilization in endemic countries.[3,4] The anticipated combined effect of implementing these interventions in 1994 will be the substantial acceleration of the rates of reduction in incidence between 1994 and 1995.

Since 1989, national eradication efforts have reduced the annual incidence of dracunculiasis by 75% (Figure 5). Confidence in the level of case reductions is based on village-based surveillance systems now covering 93% of the 16,749 known endemic villages (monthly cases reports were being submitted from 72% of these villages as of March 1993), ongoing monitoring of program activities, and periodic independent assessments of national surveillance systems, e.g., in Cameroon, Ghana, India, Nigeria, and Pakistan. As national programs focus surveillance and control interventions on the increasingly smaller number of affected villages remaining during 1994 and 1995, the implementation of rapid detection (before or within 24 hr of worm emergence) and immediate containment of all cases will increase the effectiveness of interventions to levels that interrupt transmission.

During the eradication of smallpox, a surveillance-containment strategy played a critical role in accelerating the rates of decrease of that disease and in the successful conclusion of that campaign.[5] However, unlike the Smallpox Eradication Program, there is no vaccine with which to contain the spread of dracunculiasis by protecting individuals at risk of infection. Therefore, rapid detection of all cases of dracunculiasis and their immediate containment by village-based health workers is critical during 1994 and 1995. Accelerated implementation of processes for certification of eradication by WHO is also now critically im-

portant in many formerly endemic countries, where isolated populations may support low levels of transmission.

The countries where it now appears that eradication will be the most difficult include Sudan, Nigeria, Benin, and possibly Niger. However, even in the least endemic countries remaining, significantly tighter control measures will be required to completely interrupt transmission of dracunculiasis in the two transmission seasons or less that remain before the target date. Achieving the target of zero cases of human dracunculiasis by then end of 1995 is a formidable challenge. Success will depend on securing the remaining funding needed to complete the task, and on the ability of national programs and collaborating agencies/organizations to focus surveillance and control interventions efficiently and effectively on all affected communities in the time remaining.

Acknowledgment: The assistance of Renn Doyle in preparing the figures for this paper is gratefully acknowledged.

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