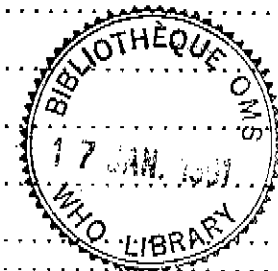




CRITERIA FOR THE CERTIFICATION OF DRACUNCULIASIS ELIMINATION¹

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¹ Report of an informal consultation on the criteria for certification of dracunculiasis elimination held in Geneva from 19 to 21 February 1990 and organized by Filariasis Control, Division of Control of Tropical Diseases, World Health Organization, Geneva, Switzerland. For list of participants, please see Annex 1.

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Note: In this document elimination of dracunculiasis country by country is considered to be the last step before eradication.

1. INTRODUCTION

Dracunculiasis (or guinea worm disease) is a disease which is endemic in certain communities without access to safe sources of drinking water and which has serious adverse effects on health, agricultural production and school attendance. The disease occurs in India and Pakistan, and in 17 African countries, extending from West Africa across the Sahel to East Africa, excluding probably Gambia, Guinea Bissau and Somalia where apparently the disease is no longer endemic (see Map 1). An estimated 120 million persons are at risk of the infection in Africa (Watts, 1987), and 10 million in Asia. About 5 to 10 million persons suffer from the disease each year. During 1989, 14 countries reported a total of 845 143 cases of dracunculiasis to the World Health Organization. More than 98% of these cases and of the 1988 cases were reported from Africa (WHO, 1990, unpublished data).

Early in the twentieth century, human dracunculiasis apparently disappeared naturally from some countries where it had been endemic, e.g., Egypt. In previous centuries dracunculiasis had been introduced into several countries of mainland North, Central and South America (e.g., Brazil) during the African slave trade, but the disease later died out (Hoeppli, 1969). It was dramatically reduced in Iran during the 1960s (Sahba, 1973) and deliberately eliminated from southern USSR in the 1920s (Litvinov & Lysenko, 1982). In 1984 dracunculiasis was eliminated in Tamil Nadu State, India (Kapali et al., 1984). Within the context of the United Nations International Drinking Water Supply and Sanitation Decade (1981-1990), a global campaign to eradicate dracunculiasis was started in the early 1980s, and, since that date, the eradication programme has steadily gained in both momentum and support.

The regional conference on dracunculiasis eradication in countries of the WHO Eastern Mediterranean Region, held in Islamabad, Pakistan, in April 1989, recommended that WHO should develop agreed-upon criteria for certification of dracunculiasis elimination from formerly endemic countries (WHO, 1989). These criteria were needed urgently in the WHO Regions of the Eastern Mediterranean, South-East Asia and Africa. In addition, with the approval of resolutions WHA39.21 and WHA42.29 in May 1986 and May 1989 respectively, the World Health Assembly endorsed the efforts to eliminate dracunculiasis country by country and declared the goal of eliminating this disease as a public health problem from the world in the 1990s (WHO, 1990).

The aim of the present paper is to describe criteria and procedures for verifying the absence of dracunculiasis transmission and for certifying its elimination from formerly endemic countries. The various stages in national elimination programmes are indicated in Table 1. Standard criteria for certification are needed for the following reasons:

- (a) To ensure international credibility for the expected, future claim that dracunculiasis has been eliminated from an area.
- (b) To have a formal mechanism for judging the success of recent national dracunculiasis elimination programmes.
- (c) To have a standard, effective procedure to identify and eliminate any previously unknown foci of transmission.
- (d) To help in the investigation of rumoured or sporadic occurrences of the infection in unconfirmed potentially endemic areas.

The need for certification of attainment is inherent in the goal of an elimination or eradication programme, as opposed to the lack of such a need in a control programme. There must be an objective basis, according to agreed criteria, for determining whether dracunculiasis has indeed been eliminated; the criteria must take into account the risk of importation from neighbouring countries as well as the need for maintaining surveillance in neighbouring countries. It is expected that certification of elimination of dracunculiasis for individual countries will usually be conducted more or less simultaneously in groups of contiguous countries until the final goal of certifying global eradication of dracunculiasis is achieved.

Rationale. There is no asymptomatic carrier state in dracunculiasis, the incubation period does not exceed one year, and there is no known animal reservoir. Therefore, the absence of indigenous cases for a three-year period, in the presence of adequate case detection, can be accepted as proof of local eradication.

2. DEFINITIONS

A case of dracunculiasis is defined as an individual exhibiting or having a history of a skin lesion with emergence of a guinea worm (WHO, 1988). A recent (within one year) history of a skin lesion with emergence of a guinea worm is the usual time-frame for use in surveillance programmes.

Elimination of dracunculiasis is the confirmed absence of clinical illness (the interruption of transmission of Dracunculus medinensis in man) for three years or longer from a sizeable geographical unit (e.g., a country) with such a low risk of reintroduction of the parasite that preventive measures could be minimized.

Eradication of dracunculiasis is the confirmed absence of clinical manifestations (the interruption of transmission of Dracunculus medinensis in man) for three years or longer from a continent.

3. ZOONOTIC ASPECTS

No animal reservoirs of infection have been identified (see Annex 2).

4. CERTIFICATION PROCEDURES

4.1 National preparations for certification

The methods employed in national preparations for the certification will depend on whether an elimination campaign is followed immediately by post-elimination surveillance and preparation for the certification, or if pre-certification activities are carried out many years after the last known case of dracunculiasis. Countries should include in their plans of action provision for support for the implementation of the national surveillance activities in preparation for the certification process. Countries should contact WHO to initiate the verification and certification process. Part of the certification process will include a detailed report on the history and current status of dracunculiasis in the country. Country reports should include the following information:

- (1) An historical account of dracunculiasis in the country, including a detailed overview of the dracunculiasis elimination campaign(s) as well as of the status of water and sanitation projects and of their contribution to the control effort.

- (2) The result of case searches including: (i) data from at least three annual case detection surveys in localities canvassed on a house-to-house, village-by-village basis, and from case registers regularly up-dated at the village level, (ii) any evidence of validation of results from the active searches and the case containment measures by teams, and (iii) the results from any other assessments carried out, e.g., in schools, markets, or other places where nomadic or migratory people congregate.
- (3) An evaluation of the effectiveness of the routine disease reporting system, including: (i) the number and distribution of primary health posts, health units, health centres, etc., throughout the endemic areas, (ii) evidence of the inclusion of dracunculiasis as a reportable disease on the official disease reporting forms, (iii) the regularity and completeness with which the health reporting units reported, (iv) validation of the specificity of the reports, and (v) records of action taken when dracunculiasis cases were reported during the latter stages of the campaign.
- (4) A description of all public health education campaigns, including, if applicable, details of whether any rewards have been paid for reporting cases of dracunculiasis and the results of these efforts.
- (5) Demographic information, including population distribution by geographical region and known significant migration patterns.

Some countries, especially currently endemic countries, may convene a national commission or group to examine programme activities and give evidence before the International Certification Team (ICT).

4.2 International preparations for certification

The reliability of certification of dracunculiasis elimination will depend on the lapse of time since the last known indigenous case and on the intensity and effectiveness of surveillance procedures. If active searches, begun during a national elimination programme, are continued for three years beyond the occurrence of the last known indigenous case, that period will be sufficient to judge whether or not elimination has been achieved. In countries where a longer period has elapsed since the last known case of the disease, without there having been specific searching for dracunculiasis, it must not be considered that a less sensitive surveillance will be sufficient to detect transmission. Dracunculiasis occurs among populations living in remote places, and consequently disabled, infected individuals may be unable to seek medical attention even at the nearest primary health post which may be some considerable distance away. In order to prepare for certification, which shall preferably be conducted on a subregional basis, WHO should consider the following approaches:

- (1) Emphasize the importance of certification by increasing relevant communication between WHO staff and appropriate national authorities.
- (2) Develop a standard format to be used by formerly endemic countries in the preparation of a country report. The format should clearly outline what is needed such as maps, figures, tabulations, etc.
- (3) Establish, as in the procedures developed for certifying the elimination of smallpox (Fenner et al., 1988), an independent international commission which would advise the Organization on criteria, procedures and progress made towards verification of absence of transmission and also contribute actively to the national certification process.
- (4) Designate a panel of experts from which International Certification Teams (ICTs) can be chosen for assignment as outlined in Annex 3.

- (5) Coordinate national preparations for certification by promoting regular visits by WHO staff, members of the designated ICT, or special consultants to the country or subregion concerned.
- (6) Establish a register of countries requesting certification and also of those countries where official certification of elimination is pending. In addition, WHO would establish an official register, listing countries where dracunculiasis has been eliminated, based on evaluations by ICTs.
- (7) Mobilize funds required for the implementation of the certification process.

4.3 Strategies for certification

In addition to the collection of baseline data to assess the status of dracunculiasis in each country, visits by WHO staff and consultants may be necessary to: (i) review questions raised by the reports and (ii) assess the situation through active searches.

WHO will need to consider the selection and operational activities of the ICTs. Their functions should include evaluation of reports provided by countries and by WHO consultants, and a thorough in-country review of the surveillance and control activities which led to the request for certification. ICT members should not include individuals who have actively participated in the national programme which the team intends to evaluate. The composition of ICTs may change from time to time, but each new team should include at least one or two members who have had experience of an earlier evaluation and certification. ICTs will be asked to reach one of two possible conclusions: either (i) they are satisfied that elimination has been achieved, or (ii) they are not satisfied (e.g. certain conditions, to be specified by the ICT, have not been met). The government of the country being certified should guarantee to the ICT full access to all documentation of programme activities and give the team free access to all parts of the country where further investigation is needed.

WHO and/or an international commission will need to consider which level of investigation will be appropriate for countries requiring certification. For example, one or more of the following activities may be required: a visit by an ICT; visits by selected expert(s); submission of a detailed written country report or written statements by health officials of that country, etc.

Table 2 lists those countries where human dracunculiasis has been: (i) endemic during the 1980s, (ii) endemic between 1940 and 1980, (iii) possibly endemic before 1940, (iv) sporadically reported without knowledge of endemic transmission. Map 2 shows the countries that are included in the four categories in Table 2. The anticipated schedule of the requests for certification of elimination of dracunculiasis are shown in Table 3. At the present time (1990) there is still a lack of knowledge on when guinea worm transmission was interrupted in many countries. The listing of countries given in Table 2 will be updated as current information becomes available during certification activities. The reliability of the data will also be checked and updated where necessary.

4.4 Operation of International Certification Teams

See Annex 3.

5. CRITERIA FOR CERTIFICATION OF ELIMINATION

On the basis of the current status of dracunculiasis, the active efforts now under way to eliminate the disease country by country, and the mandates provided by the resolutions WHA39.21 and WHA42.29 adopted by the World Health Assembly (WHO, 1990) and resolution AFR/RC38/R13 adopted by the WHO Regional Committee for Africa (WHO/AFRO, 1988), the following criteria for certification of elimination are proposed:

5.1 Countries with dracunculiasis transmission during the 1980s

National governments, requesting certification of elimination, must submit to WHO a country report (see Annex 3) which describes the procedures and provides evidence in support of the assertion that dracunculiasis has been eliminated.

In these countries, elimination will be considered to have been achieved when adequate surveillance systems have not discovered any evidence of transmission derived from careful annual searches, carried out during the expected transmission season, for three consecutive years. Surveillance, to be adequate, should include active case detection carried out, if necessary, in the most remote areas of the country. For details of adequate surveillance systems, reference should be made to the Guidelines for surveillance in dracunculiasis eradication programmes issued by the WHO Collaborating Center for Research, Training and Eradication of Dracunculiasis (1989). The establishment of a claim in relation to a specific defined area, must fulfil the following conditions:

- (1) Proof that an active case detection system has operated in the area for at least three years since the occurrence of the last known indigenous case.
- (2) Evidence that during this period no indigenous cases, originating within the three years, have been discovered. In the case of importation to a non-endemic area, where the source is identified and controlled and where transmission does not continue for more than one transmission cycle, the importation and subsequent spread will not be considered to represent an indigenous focus. If, following importation, transmission occurs for more than one transmission cycle or if the origin of the cases is not identified, the focus will be considered one of endemic transmission.
- (3) Maintenance of a register of suspected dracunculiasis infections reported or discovered during the three-year period. It must be established that each confirmed case was imported by tracing the case to its origin in a dracunculiasis endemic area.
- (4) Certification of elimination in individual countries may be granted only when there is no substantial risk of reintroduction from countries where dracunculiasis is endemic. In general, neighbouring countries will be considered for certification concomitantly. In this context it is evident that among considerations of special importance will be the danger of the reintroduction of the disease from neighbouring countries.

5.2 Formerly endemic countries (transmission occurred before 1980)

In these countries certification of elimination may be granted after the provision of satisfactory documentation relating to the following issues:

- (1) A detailed description of the extent of former endemic area(s).
- (2) The findings of one active case search, conducted within the last two years in formerly endemic areas during the expected transmission season and carried out village-by-village using recognition cards. The results should verify that residual foci of infection no longer exist. To this end, data obtained by passive surveillance will also be given due consideration.
- (3) Certification of elimination in individual countries may be granted only when there is no substantial risk of reintroduction of transmission from countries where dracunculiasis is endemic. In practice, neighbouring countries will as far as possible be considered for certification at the same time.

6. STEPS IN THE CERTIFICATION PROCESS

The proposed sequence of events listed below should be kept flexible. This listing summarizes the process for certification.

- (1) The WHO Collaborating Center for Research, Training and Eradication of Dracunculiasis, Centers for Disease Control, Atlanta, USA, will distribute a set of international guidelines on verifying the absence of dracunculiasis transmission and certifying its elimination.
- (2) Countries where dracunculiasis was formerly endemic will be encouraged to submit a formal request to WHO to verify the absence of transmission and accordingly to certify its elimination.
- (3) Such formal requests must conform with the procedures given in the guidelines, prepared by the WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis (1989). In particular, the requesting countries will produce a detailed report on all surveillance and control activities. Such countries may find it useful to designate a national committee to evaluate the report on the dracunculiasis elimination programme before its formal submission to WHO.
- (4) WHO will designate an ICT with the mandate to evaluate the country report and to determine, in collaboration with the host country, the status of the certification schedule.
- (5) The ICT will carry out the certification process, and make appropriate recommendations to WHO regarding approval of the claim that dracunculiasis has been eliminated.
- (6) If certification of elimination is granted, the country will then be listed on a WHO official register of areas now verified as free of dracunculiasis transmission.

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TABLE 1. STEPS IN THE PLANNING, IMPLEMENTATION AND EVALUATION OF PROGRAMMES TO ELIMINATE DRACUNCULIASIS
(from WHO Collaborating Center for Research, Training and Eradication of Dracunculiasis, 1989)

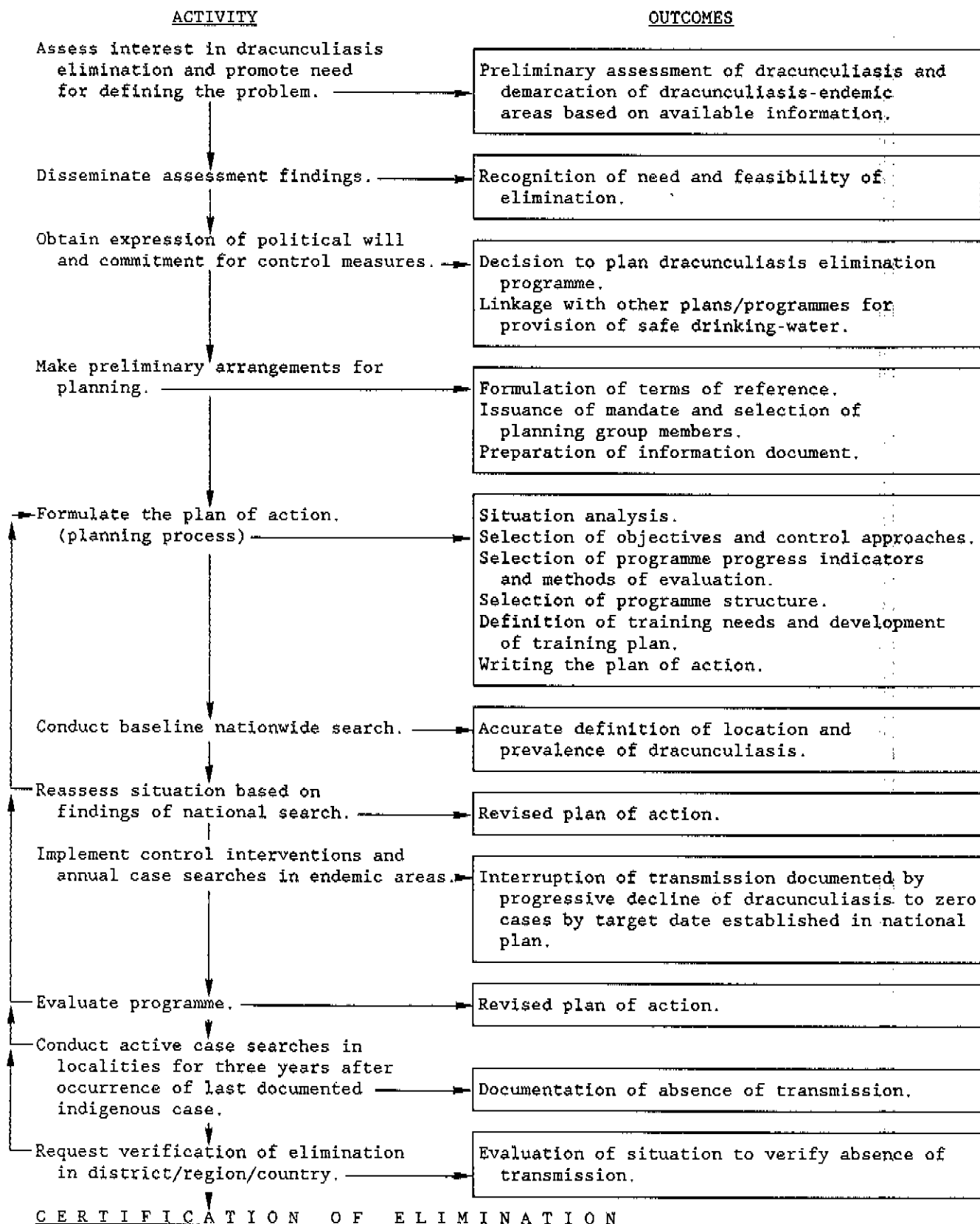


TABLE 2. PROVISIONAL LIST OF COUNTRIES AND TERRITORIES WITH A HISTORY OF DRACUNCULIASIS IN HUMANS

Countries with endemic transmission during the 1980s (Group A)

1. Benin	8. Ghana	15. Nigeria
2. Burkina Faso	9. Guinea	16. Pakistan
3. Cameroon	10. India	17. Senegal
4. Central African Republic	11. Kenya	18. Sudan
5. Chad	12. Mali	19. Togo
6. Côte d'Ivoire	13. Mauritania	20. Uganda
7. Ethiopia	14. Niger	

Formerly endemic countries (before 1980):Countries which had endemic transmission between 1940 and 1980 (Group B):

1. Gambia	3. Iran	5. Yemen
2. Guinea-Bissau	4. Saudi Arabia	

Countries and territories with possible transmission before 1940 (Group C):

1. Afghanistan	16. Grenada?	30. Myanmar
2. Algeria	17. Guyana?	31. Oman?
3. Argentina?	18. Haiti?	32. Qatar?
4. Barbados?	19. Indonesia (Java)?	33. Somalia?
5. Brazil	20. Iraq?	34. Sri Lanka
6. Colombia	21. Israel?	35. Suriname
7. Comoros?	22. Jordan?	36. United Republic of Tanzania?
8. Cuba	23. Kuwait?	37. Thailand
9. Democratic Yemen?	24. Liberia?	38. Tunisia?
10. Djibouti	25. Libya	39. United Arab Emirates
11. Dominican Republic	26. Madagascar	40. USSR
12. Egypt	27. Malawi	41. Zaire?
13. Equatorial Guinea?	28. Mexico	
14. French Guiana	29. Morocco?	
15. Gabon?		

"?" = only rumoured reports.

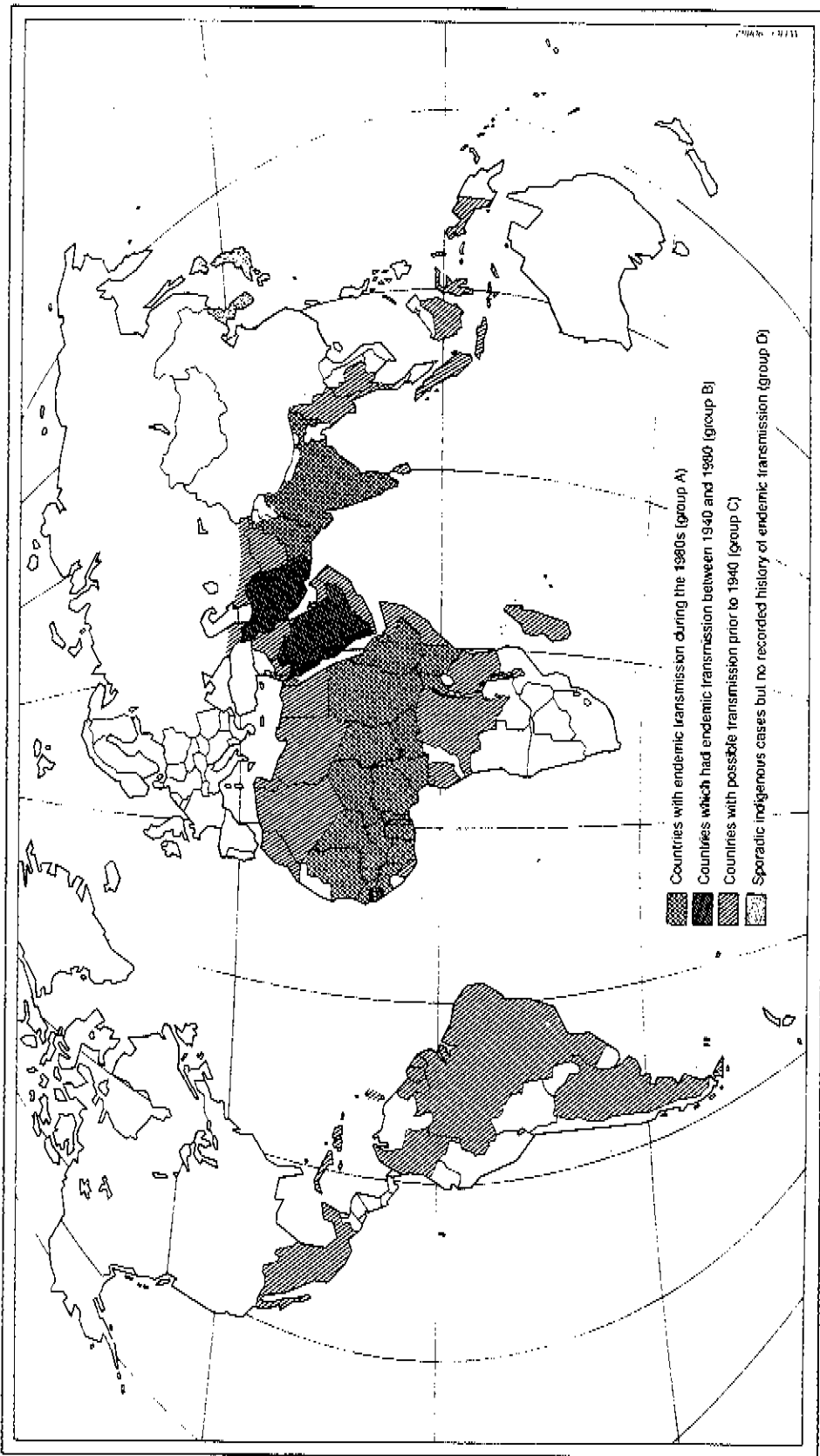
Sporadic indigenous cases but no history of endemic transmission (Group D):

1. Japan	2. Korea
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TABLE 3. ANTICIPATED SCHEDULE OF REQUESTS FOR CERTIFICATION OF
ELIMINATION OF DRACUNCULIASIS

Year	Countries	Number of countries per year
1990	Saudi Arabia, Yemen	2
1991	Brazil, Cuba, Iran, Iraq, Japan, Myanmar	6
1992	Afghanistan, Egypt, Suriname, USSR	4
1993	India, Pakistan, Sri Lanka	3
1994		0
1995		0
1996	Gambia, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Senegal	7
1997		0
1998	Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Niger, Nigeria, Togo	8
1999	Central African Republic, Chad, Ethiopia, Kenya, Somalia, Sudan, Uganda	7
	Total	37

MAP 2. COUNTRIES AND TERRITORIES WITH A HISTORY OF DRACUNCULIASIS IN HUMANS (according to provisional list in Table 1)



ANNEX 1

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Annex 1

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ANNEX 2

ZOO NOTIC ASPECTS

No animal reservoirs of infection have been identified. Although it can be difficult to differentiate dracunculids, infections allegedly caused by Dracunculus medinensis have been reported from a wide variety of animals in many parts of the world. These animals include dogs, cats, horses, cattle, wolves, foxes, badgers and leopards. Most reports have been from dogs. However, there is no evidence that either domestic or wild animals act as reservoir hosts capable of transmitting the infection to man. Nevertheless, infection in dogs is still said to occur in regions where human dracunculiasis was formerly endemic, e.g., southern USSR (Litvinov & Litvinov, 1981; Litvinov & Lysenko, 1982) and Tamil Nadu State in India (Joseph & Kandasamy, 1980; Lalitha & Anandan, 1980).

Domestic and wild mammals presumably become infected by accidental ingestion of infected copepods while drinking water. Although this mechanism is possible, it probably occurs rarely for two reasons. First, these animals drink water by lapping, an inefficient mechanism for the ingestion of copepods since the lapping action itself disturbs the water surface sufficiently to drive the elusive and rapid-swimming copepods away from the immediate area. Secondly, the altered swimming behaviour of infected copepods (Muller, 1971; Crichton & Beverly-Burton, 1977) makes their presence near the water surface unlikely. A potential alternative and likely mode of transmission is through paratenic (transport) hosts, such as frogs or fish, which ingest copepods and are capable of concentrating infective larvae in their tissues. Such a mechanism of transmission has been postulated for dracunculids of raccoons (Procyonids), mustelids, and reptiles (which drink directly very little, if any, water), and has been experimentally confirmed (Brackett, 1938; Crichton, 1977; Eberhard, 1989, personal communication).

Documented transmission of Dracunculus medinensis from animals to man is extremely rare; only two, apparently bona fide, cases have been described; one case from Korea (Hashikura, 1926, 1927), and another from Japan (Kobayashi et al., 1986). In both instances there was no evidence to indicate that the patients had travelled to endemic countries during the 12-24-month period preceding patency. Moreover, there is no record that foci of human dracunculiasis in Korea or Japan have ever existed. What was common to both occurrences was a history of ingestion of uncooked loaches (small fresh-water fish of the Cobitidae family). Loaches are effective predators of copepods from which they acquire Gnathostoma. This nematode, which is a parasite of carnivores, only accidentally infects humans in Asia who eat raw loaches; it causes ocular and visceral manifestations as well as larva migrans syndrome. There was no subsequent transmission to other humans in either case.

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ANNEX 3

OPERATION OF INTERNATIONAL CERTIFICATION TEAMS

The timing of the International Certification Teams' (ICTs) visits to the countries, and team membership will be decided by WHO in consultation with national authorities. Persons selected as team members should be able to be critical in their assessments and their views as experts should be respected both nationally and internationally. Members should be chosen from many different areas of the world so that the nature and extent of the efforts made to document the interruption of transmission may become widely known. Scientists working on dracunculiasis and countries with elimination programmes should both be represented on ICTs so that technical expertise can be exchanged and applied to the certification process. Potential conflicts of interest, such as nomination of a national from a country under review as a member of the certification team, should be avoided. In general, contiguous formerly endemic countries should be considered for certification at the same time.

The principal aim of an ICT visit to a country will be to evaluate the reliability of that country's report, by interviewing health personnel and examining records at both central and peripheral levels in order to ascertain the likelihood that dracunculiasis transmission has been interrupted as claimed. Because team members will not usually be able to spend more than 3-4 weeks in a country, the objective will be to assess the quality of the surveillance programme and to determine the probability of detecting dracunculiasis cases if transmission had occurred during the preceding three years. Preliminary visits by selected team members may be arranged by WHO to examine the status of documentation and to recommend any additional measures they think are indicated before the visit by the full team.

After arrival in the country, the ICT would spend 2-3 days in the capital to review the country report with nationals of the host country and to listen to presentations by designated officials concerning the activities carried out. To facilitate visits to all epidemiologically important areas the team would divide into groups of 1-2 members. The areas selected for visits would be those identified as having the least satisfactory documentation or as being at unusual risk of continuing transmission, for example: (i) areas near countries with affected populations, (ii) previous highly endemic areas, (iii) areas where the last cases occurred, (iv) areas with little progress in the provision of safe sources of drinking water, and (v) areas with a history of poor surveillance for dracunculiasis. Team members will decide exactly which areas, villages, and health posts they wish to visit each day.

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