

# ***Copepod filters for guinea-worm control – users have their say***

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*In Nigerian communities where dracunculiasis is endemic a sewn filter is commonly used to remove the copepod intermediate host of guinea-worm from drinking-water. Unfortunately, it is not easy to handle, and the bucket lid filter used on a much smaller scale is comparatively expensive. A field investigation revealed that a large majority of people favoured the introduction of a user-friendly plastic funnel filter developed in India. Under Nigerian conditions this device requires the diameter of its outlet to be increased to permit a suitably fast flow of water and thus to avoid excessively rapid blocking of the monofilament filter material.*

At the inception of the Nigeria Guinea-worm Eradication Programme in 1988, six major types of intervention were introduced in communities where dracunculiasis was endemic, with the objective of breaking the cycle of infection:

- surveillance;
- health education and community mobilization;
- case management;
- vector control with temephos;
- provision of safe drinking-water;
- use of household filters to remove the copepod intermediate host of the

guinea-worm from contaminated drinking-water.

The filtering of water at the point of collection through monofilament cloth to remove the intermediate host is an important short-term measure in eradication campaigns if resources are insufficient for the provision of safe water in every community where the disease is endemic. It is a responsibility of village-based health workers to distribute filters to every household in such areas, to train the inhabitants to use them, and to monitor their use. Because supplies of monofilament cloth have declined it has become necessary to restrict its distribution to communities where the need is greatest and to adopt filter designs that require the material in reduced amounts.

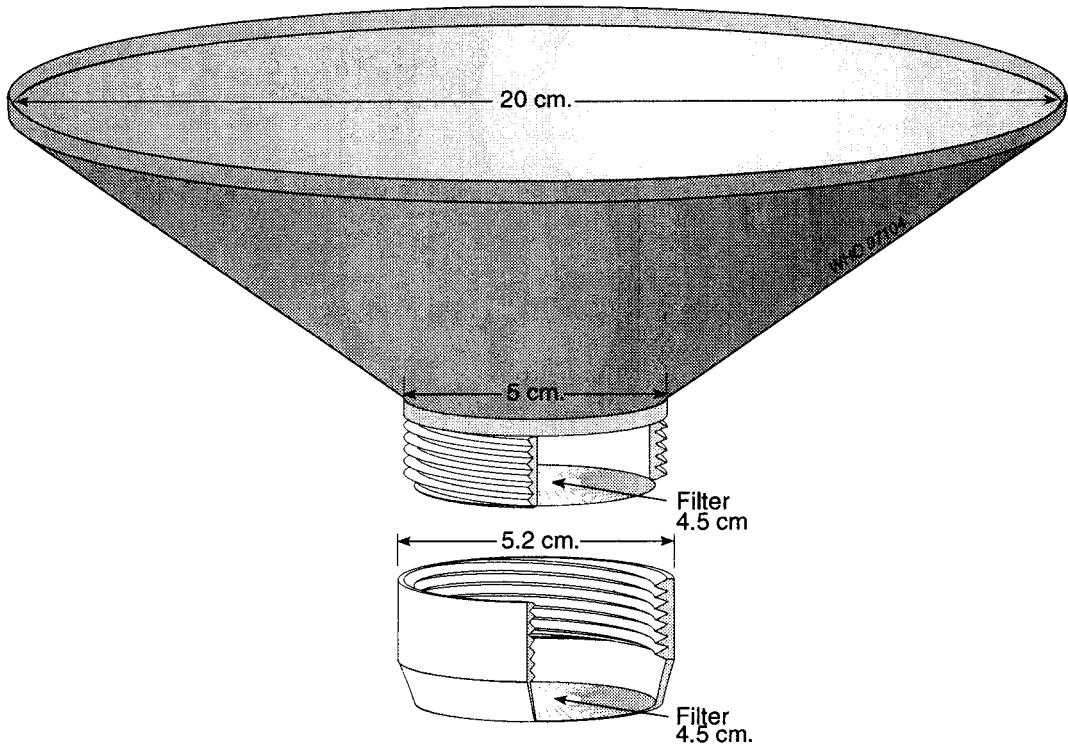
## ***Filtering out ...***

Where the filtering of drinking-water is necessary, about 90% of people use the

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**A type of funnel filter widely used for interrupting guinea-worm transmission**



sewn filter, which is approximately 50 cm square and has two strings attached to facilitate handling. It is simple and inexpensive to produce but requires much filter material. The bucket lid filter, on the other hand, used by relatively few people, does not require a lot of filter material but is much more costly to produce.

Funnel filters have been in use in India since 1981, where they were introduced for removing cyclops. They are now widely used in India and in several African countries to filter drinking-water for the pro-phylaxis of dracunculiasis. One such filter designed in India consists of a plastic funnel with a base 20 cm in diameter, an apex 5 cm in diameter, and two layers of filter material 4.5 cm in diameter, one of

which is glued to the bottom end or apex while the other is glued to a cylindrical plastic attachment that is screwed to the apex (see figure).

A study was conducted in villages where endemicity was high in Nigeria's Oyo, Ogun and Ondo States in order to assess the acceptability and adequacy of this device. Youth corps members, trained as interviewers and assessors, demonstrated the use of the funnel filter to villagers at least twice and then completed a checklist on the skills shown by respondents while using it. They also issued a pretested questionnaire to 192 people selected by systematic random sampling, 148 copies of which were properly completed, predominantly by household members but also by

village-based health workers and supervisors. The questionnaire covered:

- personal data;
- awareness of the purpose of using filters in general and the funnel filter in particular;
- preferences for the different types of filter;
- the convenience and adequacy of using the funnel filter;
- whether interviewees would recommend that the funnel filter should replace the sewn filter and the bucket lid filter.

### ... *the best filter*

The main reason for using monofilament cloth was correctly identified by 89% of respondents as the removal of cyclops. The high level of awareness of the purpose of filters was undoubtedly attributable to the following aspects of the eradication programme.

- Large-scale distribution of bucket lid filters and sewn filters had occurred in all communities where dracunculiasis was endemic.
- With the help of the mass media, village heads, heads of household, schoolteachers, village-based health workers and others, messages had been disseminated on the causes, prevention and methods of eliminating the disease.

About 90% of respondents were aware that a funnel filter had two parts, and, when asked what kind of container was most suitable for use as a funnel filter, a similar proportion correctly mentioned a keg or pot with a narrow mouth. With regard to preferences, the funnel filter was favoured by 38% of respondents, of whom 85% considered it very easy to use,

80% believed it would be adequate for use in their communities, and 81% said they would be prepared to recommend that it should replace the other types of filter. However, 36.5% of respondents said they preferred the bucket lid filter and 25.5% that they preferred the sewn filter. That the sewn filter was the least popular, notwithstanding its use by over 90% of respondents, was possibly a reflection of its being less easy to handle and use than either the bucket lid filter or the funnel filter.

It emerged that, on average, 82% of respondents adopted correct procedures in so far as they selected a container with a narrow mouth, dismantled and washed the device before using it, and washed it after use. On being asked to comment generally, 56% of the respondents remarked that the funnel filter was portable and easy to use and maintain, while 44% said that its outlet was too narrow, that water flowed out too slowly, and that this would result in frequent blockage of the filter pores with silt and colloidal soil suspensions.

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The introduction of the funnel filter as an alternative to the bucket lid filter and the sewn filter would evidently be welcomed by people in the areas of Nigeria covered by the present study. However, it is suggested that the diameter of the outer end of the funnel should be doubled so as to reduce resistance to the flow of water. It should be noted that there is a risk that people who collect filtered water in buckets will recontaminate it, especially if they are children. Concerted health education campaigns perhaps offer the best hope of overcoming this hazard.

It would be of great value if the production and distribution of funnel filters were taken up by nongovernmental organizations and others wishing to help communities where dracunculiasis is endemic. Furthermore, state and local government authorities should be made fully aware of the need to ensure the uninterrupted supply, replacement and monitoring of the filters. ■

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### **Hope for eradication**

*Dracunculiasis (guinea-worm disease) is the only parasitic disease that may be totally eradicated from the world in the near future. Although widely distributed at the beginning of the 20th century, the disease is now found only in sub-Saharan Africa, the Arabian peninsula and India. . . . Horribly painful and incapacitating, [dracunculiasis] can affect 50% or more of the population in areas where the disease is endemic. Incapacity results from pain and secondary infections associated with the emergence of guinea worms (which are 60–100 cm long and 0.2 cm in diameter) through the skin of the hands, feet or other parts of the body. Those affected do not develop immunity, so people may suffer repeatedly from the disease. . . . WHO, together with national programmes, is taking measures to break the transmission cycle and put an end to the scourge.*

- *The world health report 1996 – Fighting disease, fostering development.* Geneva, World Health Organization, 1996: 39–40.