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IMPACT OF GUINEA WORM DISEASE ON CHILDREN IN NIGERIA

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Abstract. School attendance records of all primary schools in a guinea worm-endemic village in southwestern Nigeria were examined to determine the cause of missed school days and school drop-outs. At the time of the survey, 1,495 pupils (768 boys and 727 girls) were registered in the 4 primary schools in the village, of which 21% of the pupils were infected with guinea worm disease (GWD). Female pupils had a higher infection rate than their male counterparts. Guinea worm-infected pupils missed up to 25% of school year days compared to a non-guinea worm-infected absence of 2.5%. At the height of guinea worm season in the study area, guinea worm-related absences contributed virtually all of the absenteeism recorded in the schools. Implications of the findings within the context of educational attainment of the pupils are discussed.

Guinea worm disease (GWD) is endemic in most rural communities in Nigeria. Efforts to control the infection in Ibarapa district of Oyo state have not been successful largely due to the paucity of sanitary water supply in the affected areas. Pipe-borne water supply to western Ibarapa district stops at the village of Idere, as a result, most villages in western Ibarapa depend on stagnant shallow ponds and wells for their domestic and main drinking water supply. These collections of surface water serve as breeding grounds for the *Cyclops* species, the intermediate obligatory host of *Dracunculus medinesis,* the causative organism of guinea worm infection.[1] Disability due to GWD may last for 3–4 months, depending on the location of guinea worm lesions and relative number of ulcers.[2,3] A high prevalence of GWD coincides with mid-school year activities and major agricultural activities when the farm lands are cleared manually in preparation for cultivation, planting and harvesting of the essential staple foods.

Although many workers have studied the impact of GWD in terms of lost work days and decreased agricultural productivity in the adult labor force, little is known of the effects of GWD on children's activities.[4,5] This study reports the findings of a cross-sectional survey of GWD among primary school children (aged 6–14 years) in Idere during the school year 1981–1982 and the impact of the disease on school attendance.

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MATERIALS AND METHODS

Study area

Idere is about 117 km southwest of Ibadan, the seat of Oyo state government, and about 5 km from the Rural Health Center Igbo-Ora. Domestic water supply for Idere residents comes mainly from shallow ponds. Cisterns for rain collection and stand pipes do provide some amount of water for the people. However, while on their farms, Idere farmers and their families collect their drinking water solely from shallow ponds which contain guinea worm-infected *Cyclops.* There are 4 primary schools in Idere. When not in school, most of the boys and some of the girls between the ages of 10–14 years help on the family farms.

Primary school visits

All primary schools were visited during the months of January and February of the 1981–1982 school year, the height of guinea worm season in Ibarapa. On the survey day, each pupil present in school was visually examined for a guinea worm lesion or blister and for a palpable pre-emergent adult guinea worm under the sub-

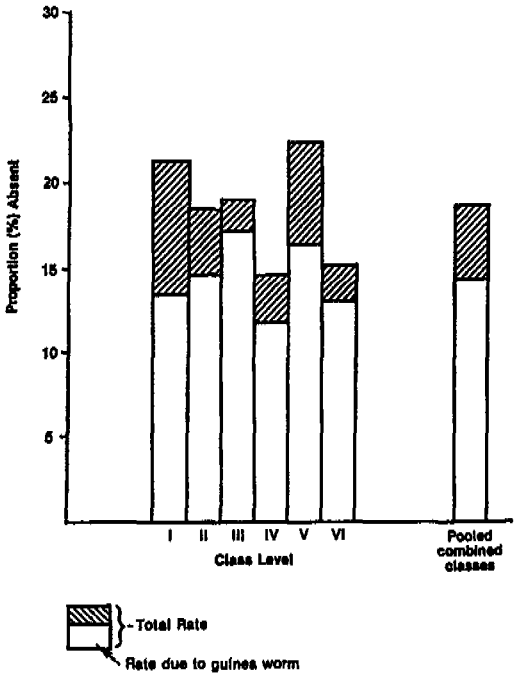

FIGURE 1. Distribution of rate of nonattendance in Idere schools by class level 1981–1982.

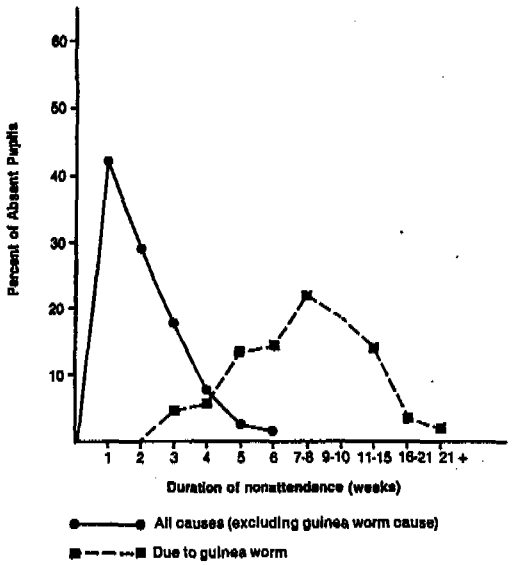

FIGURE 2. Comparison of percent duration of absenteeism (in weeks) in Idere primary schools by cause, 1980–1981.

cutaneous tissue. Attendance records of each class during the 1980–1981 and 1981–1982 school years were inspected for cause and duration of absences. Confirmation of cause for absence normally was obtained from the class teacher, but a relative of the pupil in the same school was consulted in cases of doubtful ascertainment of cause by the class teacher. Furthermore, class teachers and school headmasters were individually interviewed as to what proportion of their pupils dropped out of school each year and for what reason.

RESULTS

Registration in all primary schools in Idere during the period of the study was 1,495 pupils (768 boys and 727 girls), 68% of children (6–14 years) in the village. GWD was present in 21.2% of the pupils, with more females (22.3%) infected than males (20.2%). Figure 1 shows the proportion of pupils absent by class level during the 1981–1982 school year. Periods of high absenteeism correspond with the height of both dry season and guinea worm season in the village. GWD was the major cause for missed school days, and, during January–February, it represented almost the entire reported cause for nonattendance in schools. Absenteeism declined as guinea worm season waned. Figure 2 shows pupils with GWD were absent from school longer than non-guinea worm-infected pupils. The average absence for GWD was 9 weeks vs. 1 week for non-guinea worm absence. This represents 25% and 2.5% of missed days, respectively. School records indicated that approximately 5.7% (85) of the pupils registered in schools permanently dropped out due to guinea worm infection, while the corresponding proportion of pupils who dropped out for non-guinea worm-related reasons was 0.8% (12). GWD was the reason for the initial absence of 88% of the 97 pupils who never returned to school.

DISCUSSION

Importance of clean water supply and proper waste disposal is a difficult concept to teach the pupils in Idere primary schools because sanitary facilities are absent in the entire community. This study found that as a consequence of guinea worm infection, over 21% of Idere pupils in primary schools did not benefit from the educational opportunities provided through the school system. No provision is made for home or individual

tutoring. In Nigeria there is a strong link between literacy and attainment in leadership.

For pupils who are chronically infected with GWD to optimally benefit from the educational system, education in personal and community hygiene should become an essential component of instruction in primary schools in Idere. Collaborative effort by administrators of education and social service agencies is necessary to provide essential sanitary amenities to promote school health in rural villages, including the provision of adequate pipe-borne water and toilet facilities in primary schools and in the community. The transmission cycle of GWD is known to be interrupted in a relatively short period when adequate pipe-borne water is provided to an endemic community.[6-9]

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REFERENCES

1. Ilegbodu, Victor A., 1983. Socio-environmental factors associated with the distribution of *Dracunculus medinesis* (Guinea-worm disease) and suggested methods for control, Ibarapa, Nigeria 1982. Ph.D. dissertation, The University of Texas School of Public Health.
2. Onabamiro, S. D., 1951. The transmission of *Dracunculus medinesis* by *Thermocyclops nigerianus* as observed in a village in south-west Nigeria. *Ann. Trop. Med. Parasitol., 45:* 1–10.
3. Kale, O. O., 1977. Clinico-epidemiological profile of guinea worm in the Ibadan district of Nigeria. *Am. J. Trop. Med. Hyg., 26:* 208–214.
4. Belcher, D. W., Wurapa, F. K., Ward, W. B., and Lourie, I. N., 1975. Guinea worm in southern Ghana: Its epidemiology and impact on agricultural productivity. *Am. J. Trop. Med. Hyg., 24:* 243–249.
5. Abolarin, M. O., 1981. Guinea worm infection in a Nigerian village. *Trop. Geogr. Med., 33:* 83–88.
6. Biswas, A. K., 1981. Water for Third World. *Foreign Aff., 160:* 148–166.
7. Hopkins, D. R., 1983. Dracunculiasis: An eradicable scourge. *Epidemiol. Rev., 5:* 208–219.
8. Rao, C. K., Paul, R. C., Sharma, M. I., and Kumar, S., 1981. Guinea worm disease in India: Current status and strategy of its eradication. *J. Communic. Dis., 13:* 1–7.
9. Hopkins, D. R., and Foege, W., 1981. Guinea worm disease. *Science, 212:* 415.