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# PREVALENCE AND DISABILITIES CAUSED BY GUINEA-WORM DISEASE (*DRACUNCULIASIS*) INFECTION AMONG RURAL DWELLERS IN EBONYI STATE, NIGERIA

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## ABSTRACT
*A survey was carried out in 2001 to ascertain the status of Guinea worm disease infection among farm households in Ebonyi Local Government Area (LGA) of Ebonyi State. A total of 3,777 respondents were randomly sampled from 15 communities that comprised the LGA. The sample respondents were clinically examined and then interviewed with structured questionnaires. Data collected were analyzed using percentages, frequency and ratios. Results of the study revealed that a total of 192 respondents were infected by the disease which gave prevalence rate of 5.08%. Majority (54.15%) of the infected persons were farmers who were in the prime of their productive lives. It is therefore recommended that portable clean and safe drinking water should be provided to the rural communities in the study area. This requires the assistance of both governments and non-government organizations. Again, awareness campaign should be mounted in the study area to sensitize the rural communities on the prevalence of the disease in their area as well as the necessary precautionary measures to avoid infection of the disease. On the other hand health and agricultural extension workers should educate the rural households on the various safety measures to prevent infection of the disease and/or manage the disease if one becomes infected.*

**Key words:** prevalence, disabilities, guinea-worm disease infection rural dwellers

## INTRODUCTION
The prevalence of Guinea worm disease (*Dracunculiasis*) is an indication of the percentage of people who do not have access to clean and safe drinking water in any country , which is one of man's basic needs. Ironically, guinea worm disease is the only communicable disease that can be totally eliminated by the provision of clean and safe drinking water. Dracunculiasis is one of the oldest known human parasitic diseases that is still responsible for some 20 million cases of avoidable and preventable ill-health in 17 African communities and worldwide. (Guineaworm Wrap-up, 1999). Its present distribution, limited as it is, is a reflection of the existing gross inequalities between the developed and developing countries as well as within countries. This filarial worm differs from the other filariae in that its port of entry into the body is by the mouth.

About 250 million people in the globe are currently at risk of this infection which is exclusively a disease of the rural poor, who lack safe drinking water. It degrades and reduces sufferers to a state of dependence for as long as three months or more as well as inflict psychological anguish on them (Azoro, 2001). Its effects are crippling and cause mental anguish as the worms emerge from the legs, chest and even the genitalia. While the disease itself does not kill, its complications like tetanus and repeated infections are common causes of permanent disabilities. When the disease affects mothers, it has an

impact on child survival in terms of failure of childcare, self-care, domestic tasks and income generation. (Nwosu *et al*., 1982).

The greatest morbidity of guinea worm is in adults in the productive age groups. The attack rate depends on the endemicity which could be between 10 – 90% of the community and tend to be seasonal. Thus, its impact on farm work output in the affected areas relates very closely to the economic performance of that community. These ramifications have become obvious, as various models have indicated that especially in the rice growing countries, where the paddies are the source of infection, massive revenues can be lost as a result of the reduction in labour, and decrease in acreage. Income and agricultural earnings as well as food supplies and stores for domestic consumption are also adversely affected. It thus follows that during the seasons of major Guinea worm outbreaks, malnutrition could be a direct or indirect consequence (Azoro, 2001). Cost of treatment for those affected becomes an additional burden, which can aggravate mental and other social problems in an already impoverished family or community. A study in a rice-growing region in Southern Nigeria estimated that Guinea worm disease caused losses totaling about 20 million US Dollars per year. Ondo State, which produces 60% of Nigeria's cocoa is one of the states most heavily infested with Guinea worm.( Guinea worm. Wrap-up 1999). The disease is usually painful and can make walking and working nearly impossible, leading to reduced productivity among farmers, absenteeism and low academic performance among children (Nwosu *et al.,* 1982; Onwuliri *et al.,* 1990).

Ebonyi state, in Southeastern Nigeria was named as one of the endemic areas of guinea-worm infestation (Nwosu *et al.,* 1982). The State is also one of the major food producing areas in Nigeria especially for crops like yam, rice, cassava and groundnut. Many communities in the State have large expanse of stagnant ponds, swamps and low land areas which retain water all year round many of which are heavily infested with guinea-worms. Over the years these ponds and swamps serve the farming communities as sources of water for household use (Azoro,2001) .

Again, many farmers grow their crops especially rice in such swamps and low land areas thereby coming in contact frequently with the guinea-worm infested water environment through drinking of such waters which predisposed them to infection and re-infection. Furthermore, many post harvest and processing activities requiring water are performed with guinea-worm infested water from those ponds which also provide and increases the chance of introducing guinea-worm eggs into the body. These infestations do so much affect the farming activities of infected farmers. It is therefore necessary to investigate the status of guinea-worm disease infestation as well as its physical effects on farmers in Ebonyi Local Government Area of Ebonyi State.

## METHODOLOGY

The study was carried out in Ebonyi Local Government Area of Ebonyi State to confirm an earlier report by Nwosu *et al,* (1982) that there was high prevalence rate of Guienea worm infestation in many rural communities of Ebonyi State. In view of this, a total of 15 communities were purposively sampled for the study based on the observation of the existence of isolated ponds and swamps in the area. By random sampling, a sample size of 3,777 persons were clinically examined against guinea-worm disease (*Dracunculiasis*) and interviewed for the study (see Table 1). With use of structured questionnaire, relevant data concerning sex, age, occupation, effects of the disease etc. were collected from the

selected respondents. The study adopted a full population study where comprehensive list of inhabitants in each community was compiled and their guinea worm status during the period of the study examined and recorded: It should be noted that a case of guinea worm incidence is simply the emergence of a white thread like worm from an ulcer in the skin during the period under study. The data were then analyzed with descriptive statistics such frequency table, percentages as well as chi-square statistics.

## RESULTS AND DISCUSSION

Generally a total of 3,777 respondents wee examined and interviewed for guinea-worm disease infections. Results in Table 1 revealed that 192 respondents were infected giving a prevalence rate of 5.08%. It was also observed that infection varied among villages with Ephenyim recording the highest prevalence of 9.66%, followed Egwudinagu (8.72%) while there were no infections observed in Aghalegu and Ochakwu villages.

**Table 1: Prevalence of Guinea worm infections in Various Communities in the Study Area.**

| Community | Number Examined | Number Infected | % Prevalence |
|---|---|---|---|
| Abarigwe | 259 | 12 | 4.63 |
| Aghalegu | 158 | 0 | 0.00 |
| Egwudinagu | 321 | 28 | 8.72 |
| Ekebeligwe | 286 | 16 | 5.59 |
| Ephenyim | 445 | 43 | 9.66 |
| Ezza – ofu | 204 | 9 | 4.41 |
| Ndiechi | 276 | 21 | 7.60 |
| Nduioke | 266 | 12 | 4.51 |
| Ochakwu | 138 | 0 | 0.00 |
| Omega | 246 | 10 | 4.06 |
| Onyirigo | 198 | 4 | 2.02 |
| Amega | 244 | 11 | 4.50 |
| Elerigwe | 255 | 2 | 0.78 |
| Diofia | 198 | 3 | 2.57 |
| **Total** | **3777** | **192** | **Mean 5.08** |

Source: Field Survey, 2001

From results in Table 2, both sexes were found to be infected by the disease during the study. Of the 3,777 persons examined for Guinea worm disease infection, 1974 and 1,803 persons were males and females respectively. Of the 1974 males, examined during the study, 109 (5.52%) were infected by the disease while 83 (4.60%) out of 1803 female respondents examined were also infected by guinea-worm disease. This gave approximate infection ratio of 1:1 between male and female respondents.

**Table 2: Distribution of Respondents According to Prevalence of Guinea-worm Women Infection by Sex:**

| Sex | Number examined | No infected | Percentage% Among the Infected ** |
|---|---|---|---|
| Male | 1,974 | 109 | 5.53 |
| Female | 1,803 | 83 | 4.60 |
| Total | 3,777 | 192 | |

Source: Field Survey, 2001. ** Percentage derived from number of males and females examined.

From result in Table 3 it was observed that all age groups were infected. Infection rate was highest in persons between 11-20 (6.93%) of age followed closely by those in 21 – 30 years (6.73%) of age as well as those in 31 – 40 years of age (6.64%). On the whole observation showed that 85.44% of all the infected persons were within the first five decades of life and at the prime of their productive lives while a lower percentage of persons above this age limit were also infected. This indicates that tendency to impair the agricultural productivity of the infected farm households was only high.

**Table 3:Prevalence of Guinea Worm Disease Infection among age groups in the Study Area**

| Age | No Examined | No. Infection | %Infection* |
|---|---|---|---|
| 0 – 10 | 480 | 20 | 10.41 |
| 11 – 20 | 505 | 35 | 18.22 |
| 21 – 30 | 624 | 42 | 21.87 |
| 31 – 40 | 572 | 38 | 19.79 |
| 41 – 50 | 436 | 30 | 15.62 |
| Above 50 | 1160 | 27 | 14.06 |
| **Total** | **3777** | **192** | **100** |

Source: Field Survey, 2001. * Expressed as % of 192 infected persons.

Also, results in Table 4 revealed that of the 109 males respondents infected by the disease 25.69% and 32.11% had crippling effects and lowered sexual activity respectively while 42.2% had not observed these effects. Similarly 28.92% and 39.76% had crippling effects and lowered sexual activity among the 83 female respondents infected. Also only 10 females (2.05%) had poor maternal care for their children due to guinea worm infections. These disabilities have serous negative health effects on both farming activities as well as household responsibilities of infected persons.

**Table 4: Distribution of Respondents According to Disabilities caused by Guinea Worm Disease**

| | | | Types of Disabilities | | | | |
|---|---|---|---|---|---|---|---|
| **Sex** | **Number examined** | **Number infected** | **Crippling effect (%)** | **Poor maternal Care(%)** | **Lowered sexual activity(%)** | **No Disability yet(%)** | **Total** |
| Male | 2974 | 109 | 28(25.69) | 0(0.00) | 35(32.11) | 46(42.20) | 100 |
| Female | 1803 | 83 | 24(28.92) | 10(12.05) | 33(39.76) | 16(19.28) | 100 |
| Total | 3,777 | 192 | 52(27.08) | 10(5.21) | 68(35.42) | 62(32.29) | |

Source: Field Survey, 2001.

Results in Table 5 revealed that rural farmers formed the majority (54.15%) of respondents examined. Among the 2081 farmers examined, 104 were infected by the disease giving a value of 1:20 ratio of infection among farmers in the study area. This implies that among every 20 farmers, one was infected with guinea-worm disease in the study area. Thus result showed that among the respondents, majority (54.15%) were farmer, followed by artisans (20.83%), and students (18.75%). This trend could not be out of place since the study area is a rural environment predominantly occupied by rural farm households. The consequences of this trend were that several farm activities in the affected households were hampered due to resultant disabilities and indispositions caused by the disease. Under the ill health conditions rice, yam and cassava production for which the study area was known was usually seriously hampered especially among the effected households. During this condition, performance of farm operations become minimal, family income are divert to health care instead of farm care; farm productivity reduces, while farm income diminishes drastically leaving a trail of poverty and hunger in the farm households. Okoye *et al,* 1995 remarked that the social and economic impact of the guinea worm disease include general despondency, misery, loss of productive ability, fall in food production, and poverty.

**Table 5: Guinea-worm disease infestation among different Occupational groups in Ebonyi Local Government Area**

| **Occupation** | **No. examined** | **Number infected** | ***Percentage of Infected persons** |
|---|---|---|---|
| Farmers | 2081 | 104 | 54.15 |
| Students | 590 | 36 | 18.75 |
| Artisans | 805 | 40 | 20.85 |
| Civil servants | 301 | 12 | 6.25 |
| **Total** | 3,777 | 192 | 100 |

Source: Field Survey, 2001. * Figure was calculated from among 192 infected respondents.

Although higher prevalence rates in males than in females have been reported (Nwoke, 1992), the present study showed no significant difference (P>0.05) in prevalence between males and females. The result is in agreement with reports by Edungbola (1983) about Babana district of Kwara State where both sexes were engaged in farming, drank from the same source of water and thus were similarly exposed to infection. In Ebonyi LGA, both males and females work collectively in the farms and share the same source of dinking water hence the similarity in guinea worm disease prevalence among the sexes.

Also, there was no significant difference (P>0.05) in prevalence of the disease in relation with occupation of the respondents although farmers were in the majority. This implies that the prevalence of disease was not perculiar to respondents of a particular occupation. This could be explained by the fact that since water was medium for infection respondents of diverse occupations still utilize the same water in a particular location thereby having no significance difference in the incidence of disease infection.

However, there was significance difference (P>0.05) in the prevalence of the disease among various communities in the study area. This indicates that incidence of the

disease infections was significantly higher in some communities (e.g. Ephenyim (9.6%) than in some others such as Ochakwu (0.00%) and Ekirigwe (0.78%).

**Table 6: Chi-sequare tests of relationships between prevalence of guineaworm disease and sex, occupation and location of Respondents**

| Variables | Degree of freedom | $X^2$ calculated | $X^2$ tabulated | Significant status at 5% |
|---|---|---|---|---|
| Sex | 1 | 0.62 | 3.84 | Not Significant |
| Occupation | 3 | 2.11 | 3.84 | Not Significant |
| Location | 14 | 8.80 | 3.84 | Significant |

Calculated from survey data

## CONCLUSION AND RECOMMENDATIONS

The incidence of guinea-worm disease in Ebonyi Local Government Area and its prevalence rate were highlighted in this paper. The disease in the study area has prevalence rate of 5.08%. Majority of the infected respondents were still in their active productive stage of life an indication that the disease undoubtedly compromised the efficiency of their productivity. Majority of those infected were rural farmers whose farming activities were seriously hampered by the disease bring about reduced productivity, poverty and hunger on their households. There is significant difference in the disease prevalence among communities in the study area.

It is therefore recommended that portable clean and safe drinking water should be provided to the rural communities in the study area. This requires the assistance of both governments and non-government organizations. Again, awareness campaign should be mounted in the study area to sensitize the rural communities on the prevalence of the disease in their area as well as the necessary precautionary measures against guinea worm infestation. Similarly, health and agricultural extension workers should educate the rural households on water purification processes as well as the various safety measures to prevent infection of the disease and/or manage the disease if one becomes infected.

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