PREVALENCE OF SOIL TRANSMITTED HELMINTHS IN SCHOOL CHILDREN IN THE FEDERAL TERRITORY OF MALAYSIA

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SUMMARY

*A study conducted in all the government schools in **Wilayah** to find the prevalence rate of worm infection in urban schools revealed that 50 percent of the 7,682 school children examined suffered from helminthiasis. More than 50 percent had mixed infections, worm infection was more prevalent among Malays and Indians. Both males and females had an equal prevalence of worm infection. Schools near the squatter areas had high infection rates. This was attributed to poverty, cultural factors, and environmental sanitation in the squatter areas.*

INTRODUCTION

Kuala Lumpur the Federal Capital of Malaysia evolved from a small mining village in 1857 to its present status as the Federal capital of Malaysia. On 1st February 1972, Kuala Lumpur was conferred the status of a city with an area of 36 sq. miles. With the amendment of the Federal Constitution 1973, the limits of the Federal Territory *(Wilayah)* were laid out and the area was increased to 94 square miles. [1]

The population of Kuala Lumpur is approximately 1,000,000, consisting of 28.4 percent Malays, 56 percent Chinese, 14.4 percent Indians and others 1.3 percent.

Housing standards have also improved. In 1958 Dewan Bandaraya started building low cost houses. During the period of the Second Malaysia Plan 1971 - 1975, 9,099 units of low cost houses were built. During the 3rd Malaysia Plan 1976 - 1980, a further 13,747 units were built. [2]

Water supply to the urban poor has improved. Presently, there are 831 standpipes with about 40 households sharing a standpipe. Under the 4th Malaysia Plan it is hoped that 20 households will have one standpipe. (City Hall, unpublished data).

In the city of Kuala Lumpur, health consciousness and health awareness have increased in the general public. Since the Ministry of Education started Health Education as a subject in primary schools in 1970, health awareness among school children has also increased. School children have also benefitted from the various forms of health education delivered in the form of health talks, film shows and exhibitions given by the various Government and Private Agencies. Curative services in *Wilayah* in the form of private hospitals and private medical practitioners have also increased. Preventive services have also improved and this is evidenced in the decrease of the

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incidence of some of the communicable diseases especially childhood diseases e.g. Polio - 36 cases in 1965, 2 cases in 1970 and 0 case in 1980; Diphtheria - 169 cases in 1965, 17 cases in 1970 and 1 case in 1980. [3,4]

Among other reasons for the influx of migrants from the rural to the urban area, there is the impression in the rural areas that there are increased and more sophisticated job opportunities in the city. One of the most pressing problems in the squatter areas is that regarding health, such as environmental sanitation, proper water supply, and the control of infectious diseases especially among mothers and children. In the squatter areas worm infestation is very common. [5]

The objective of this survey was to determine the prevalence of worm infection among the school children in the city of Kuala Lumpur and to discuss the possible causes of this problem in the city.

MATERIALS AND METHODS

Letters of permission from the Ministry of Education to conduct the survey was obtained. The sisters from the school health section of the City Hall went to the schools and explained to the headmasters and the teachers how and when to collect the stools. A few days before the collection of stools, a revisit was made to supply the schools with cups, spatula and bags for the collection. The stool collection bags were distributed to the students by the teachers the day before the collection day. The following day the samples were collected from the schools for laboratory investigation. Those children who could not produce stools, were excluded from the study.

From 143 primary schools and 49 secondary schools, a systematic stratified sample of stools was taken. Of these, 2,576 were from Std. I children between the ages six and seven years, 2,450 were from Std. VI children between the ages 11 and 12 years, 1,706 were from Form III children between the ages 14 and 15 years and 950 were from Form V children between the ages 16 and 17 years. The study covered a total of 7,682 school children. Of these, 36 percent were Malays, 48 percent Chinese and 14 percent Indians and 1 percent others. The stool samples were examined by the Kato thick smear technique.

RESULTS

Among the Std. I children, 23.8 percent (613) were infected with *Ascaris lumbricoides,* 42.9 percent (1106) with *Trichuris trichiura* and 1.6 percent (40) with hookworms. Among the 2450 Std. VI children 27.1 percent were infected with *Ascaris,* 51.9 percent with *Trichuris* and 4.6 percent with hookworms. Among the 1706 Form III children 16.8 percent were infected with *Ascaris,* 41 percent with *Trichuris* and 6.7 percent with hookworms. Among the 950 Form V children, 12.3 percent were infected with *Ascaris,* 35.7 percent with *Trichuris* and 9.3 percent with hookworms.

Of the total 7,682 children the overall infection rate was 50.1 percent. 44.5 percent were infected with *Trichuris,* 21.9 percent were infected with *Ascaris,* and only 4.6 percent with hookworms. Many children were infected with more than one type of worm. The overall infection rates in Std. I, Std. VI, Form III and Form V were 48.2 percent, 57.3 percent, 47 percent and 42.6 percent respectively. In the various racial groups it was found that 67 percent of the Malays, 64 percent of the Indians and 33 percent of the Chinese were infected. The overall infection rate among the males was 50.7 percent, and that among the females was 50.1 percent.

DISCUSSION

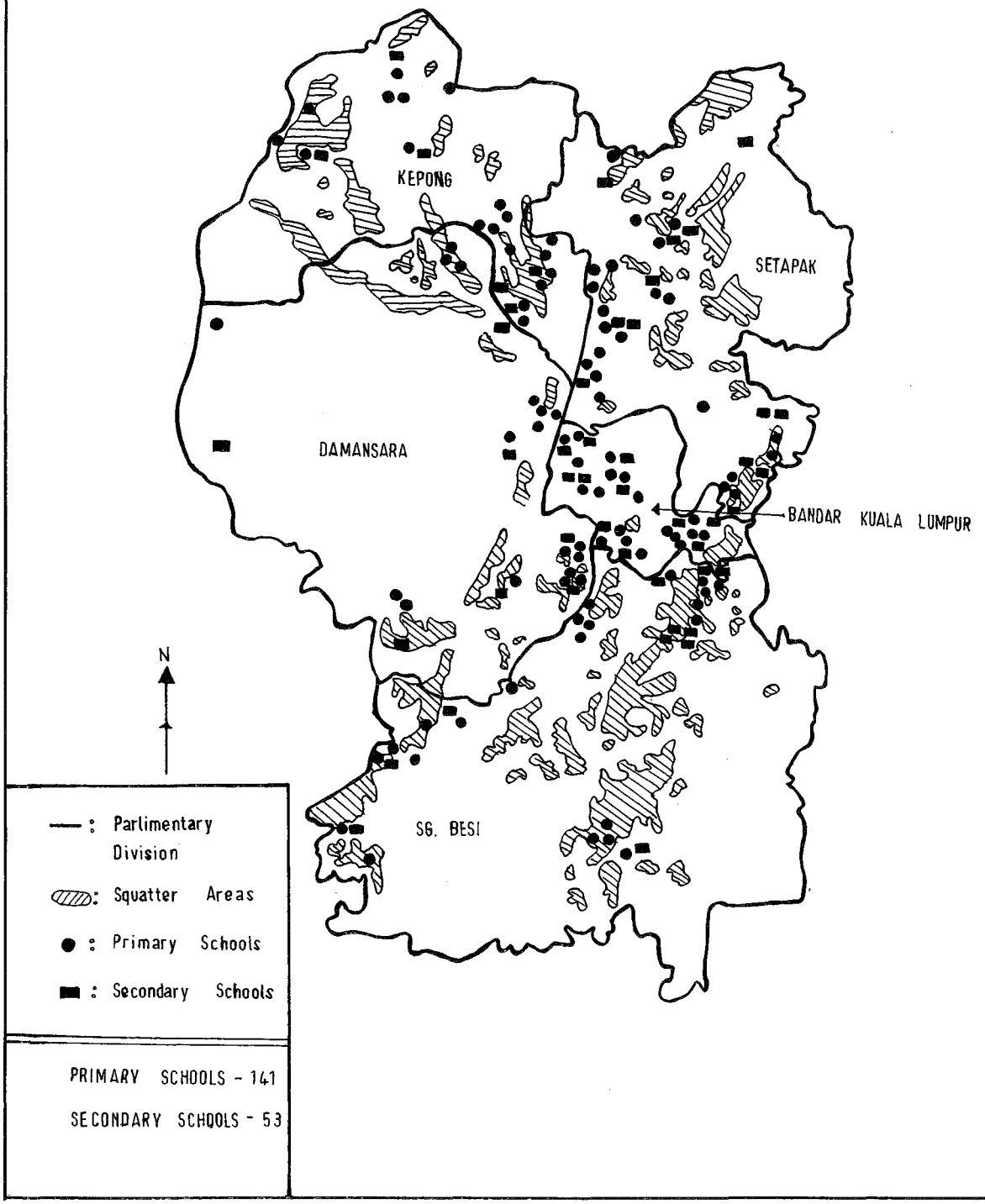
The results showed that the most prevalent infection among school children was *Trichuris* with 44.5 percent infection rate. The next commonest infection was *Ascaris* with 21.9 percent, and a small percentage, 4.6 percent, was infected with hookworms. In this study, the overall infection rate among the school children in *Wilayah* was 50.1 percent.

A study done on rural school children, in Telok Dato showed that the rates of infection was higher than that in Kuala Lumpur. [6] The types of infection in those rural school children though similar, differed in prevalence - 43.2 percent, 86.7 percent and 84.5 percent were infected with hookworms, *Ascaris* and *Trichuris* respectively. The lower rates of infection in urban school children could be attributed to the following factors :

Housing Condition

An appreciable number of school children lived in flats, therefore many of them did not do gardening or work in fields, therefore they were less in contact with moist earth where the eggs of the

DISTRIBUTION OF SCHOOLS IN WILAYAH PERSEKUTUAN, KUALA LUMPUR



worms matured.

Sanitation

Compared to the rural area, in the urban area many of the school children had better and more hygienic toilet facilities. Only about 20 percent of the population used the bucket system and 22 percent pit and over water latrines. [7]

Water Supply

In the city of Kuala Lumpur about 75 percent of the people have piped water supply. Others get potable water from the standpipes which are 831 in number. [2] This easy source of water supply made it easier for school children to wash their hands with clean water before eating or handling food. A few get their water supply from wells.

Health Awareness and Facilities

The urban population in Kuala Lumpur are probably more aware of health problems and more health conscious. This could be due to the more frequent exposure to health problems and education in the form of film shows, exhibitions and public forums organised by the government and other private organisations. There are many more preventive and curative services available to the public through Government and also private agencies.

It was noted in the study that the schools with the highest infection rates were those situated near squatter areas. (Fig. 1) About 80 percent of the schools with a worm infection rate of more than 50 percent were situated near the squatter areas. In squatter areas the standard of hygiene, environmental sanitation and housing condition were poor. A large population of children in the schools near the squatter areas came from the squatter areas. The results showed that worm infection was more prevalent in Malays and Indians. This could be due to various factors.

Cultural Factors.

Most of the Malays and Indians eat with their fingers. Fingers contaminated with soil and other materials harbouring matured eggs, and improper washing of fingers before meals could contribute to the increased incidence of worms in the two races.

Squatters

Majority of the squatters in *Wilayah* are Malays and Indians. In the squatter areas, environmental sanitation is poor and potable water is not easily accessible to every household. Even if potable water is available through the government's concerted efforts, conditions of storage of this water is poor. This could contribute to the high infection rates. Poor toilet facilities in the squatter areas also contributed to the high infection rate. At the time of the study, health awareness of the squatters was not as satisfactory as that of their counterparts in the main city.

Another finding from the study was that contrary to the expectation that the most affected group would be the school entrants, it was found that Std. VI school children were the ones who had the highest rate of infection - 57.3 percent compared to 48.2 percent of Std. I school children. Possible reasons could be:

(a) The school environment itself. It was possible that children who came from clean homes got the infection in schools when they started playing games and had physical exercises sometimes barefooted, and therefore in contact with soil and contaminated material. After games, improper washing of hands and eating food with contaminated fingers could cause the intake of embryonated eggs.

(b) School Canteens and Hawkers

Improper handling of food in canteens and by hawkers outside the school premises could also be a possible source of infection. Washing of plates and food receptacles at ground level and contamination with soil, of food subsequently stored could cause the spread of worm infestation. Swallowing of embryonated eggs of roundworms and whipworms cause the infection in humans. [8] The possible sources of infection as revealed in a study done in Japan, [9] showed that vegetables, soil, dust, hands and fingers were the principle sources of roundworm infection among the school children examined.

The effects of helminthiasis on nutrition have been studied by various scholars. Sirisinha *et al* [10] at Mahidol University in Bangkok have associated helminthiasis and decreased host defense mechanism, thus increasing the incidence and severity of infection. Kurian [11] states that all cases of intestinal ascariasis should be treated, as the complication of untreated ascariasis is severe. However in Trichuris infection there is no

treatment needed for mild or asymptomatic cases. [9] In a study done in Kenya, L S Stephenson *et al* [12] also emphasises that as Ascaris infection might contribute to protein - energy malnutrition in growing children in developing countries, control of ascaris is important.

CONCLUSION

This study showed that worm infection among school children was one of the health problems in Kuala Lumpur. This study also emphasised the fact that the health of squatters and environmental sanitation in squatter areas, had to be improved in order to improve the overall health standard of school children in *Wilayah*.

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