Population mobility and malaria contraction on either side of Bago Yoma in Bago Division

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During August 1983 to February 1984, household surveys were carried out in four rural areas on either side of Bago Yoma in the Bago Division to describe the extent and patterns of population mobility by enquiring about their travelling history with night visits to the forested foothill areas for the past one year. Those people residing close or very close to foothill travelled most (12 to 28%) during the wet season while those residing some distance away spent their nights most (14 to 17%) during the dry season. The closer the village to the foothill, the longer a forest traveller stayed in the forest, the range being 45-170days per year in the foothill and 12-14 days per year in the plain villages. Of those forest travellers, there were a few percentage (5 to 20%) of constant habitual traveller to the nearby forest. In addition, at least one member of 40 to 70% of the households spent one night visit in the forest. The implications of the various migratory groups between the villages and the Bago Yoma were discussed in the context of malaria contraction, and control.

INTRODUCTION

Malaria has been identified as the first or second national priority health problems for control in the three sucessive 4-year terms of the People's Health Plan since its launching in 1978 (1,2,3). Malaria incidence varies according to topographic conditions of Myan-Mar. It constitutes about 20% or more of the total hospital admission in regions with forested mountain ranges such as in the Chin and Kachin States in Northern Myanmar, while the incidence is low in the deltaic region as in the Ayeyarwady Division where malaria admission to hospitals are less than 10% of the total in-patients (4).

The purpose of this paper is to describe the extent and patterns of population mobility of villagers in villages along the eastern and western sides of Bago Yoma in the Bago Division of Myanmar. The present findings were based on the exploratory surveys and geographical reconnaisance for selecting a suitable site to study the dynamics of malaria transmission in a representative foothill and plain areas in the Bago Division.

MATERIALS AND METHODS

Study areas and populations : These study areas were chosen among the villages near or having communication with the forest fringes of the Bago Yoma (mountain range) both on its eastern and western sides (Fig). The Bago Yoma originates just outside the Greater Yangon city and runs northwards for about 450 km. It has about 30 km in its widest width. It is covered with thick forest along its whole length and breath, especially in its southern half.

All together, four sites were visited. The information on each study village with regard to distance from the Yoma, number of households and population, children's spleen and infant parasite rate is shown in the Table.

Household interview: All the households in the villages except random samples (about 40%) in site 4 were visited using a standardized questionnaire. The head or senior adult member of each household was interviewed about the habitual behaviour of all the household members concerning travelling history with night

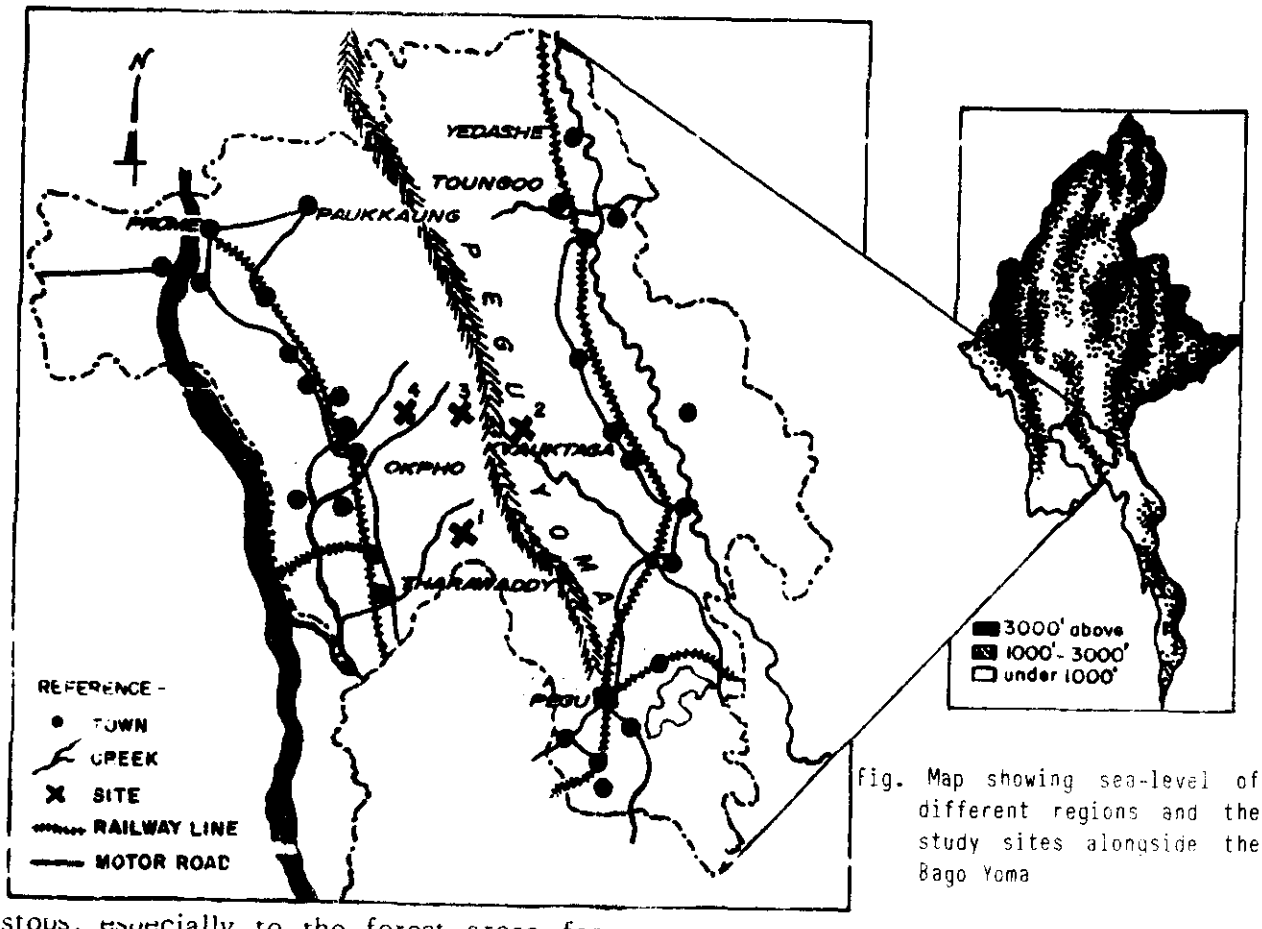

fig. Map showing sea-level of different regions and the study sites alongside the Bago Yoma

stops, especially to the forest areas for the past one year.

RESULTS

Site 1 : On the day of survey, a proportion(about 11%) of the population had moved out temporarily in whole families to work in government agricultural farms near the foothill and another 12% of population had gone out on night-stop visit to the forest in the foothill. As regards travelling to the forest by season, 7.7% of the population travelled in summer, 18.0% in monsoon and 5.8% in winter. Again, about 5% of them were habitual forest travellers in all seasons. In site 1, the numbers of travelling households (which had at least one household member spending one night in the forest) were 71.2%(Table). On the other hand, the average duration of days spent per traveller per year in the forest was 45 days (Table).

Site 2 : On the day of interview, 4.6% of the population from Myochaung and 2.4% from Da-nyin-gone villages had temporarily moved out in whole families to work in the forest area. Also, 9.3% from the former and 21.0% from the latter were travelling out of the villages to the forest. Regarding the travelling status by season, in both the villages, most people travelled out during monsoon, 28% in Myo-chaung and 13% in Da-yin-gone. Moreover, only 18.5% and 4.8% of the people were respectively involved forest travelling in all the seasons. In term of travelling household, 71.4% in the former and 53.3% in the latter villages were involved in work connected with the forest (Table). The average duration of travel per traveller per year was 172 days in Myo-chaung and 83 days in Da-nyin-gone (Table).

Site 3 : By season, most of the forest travelling in Waing occurred in winter

(14.9%) and in Kaing-taw-su in Monsoon (13.4%). By all seasons, only 7.7% of the individuals in Waing and 3.4% in Kaing-taw-su went to the forest for work. On average, the numbers of days travelled in the two villages per traveller per year were 47.8 days and 51.2 days respectively (Table). Similarly, 65.7% and 67.6% of the households were communicated respectively with the forest at least once a year (Table).

Site 4 :Most people in Kyun-net-kone and Sein-gyi-yo travelled more in the dry seasons than wet season, and the average duration of travel per traveller per year was shorter (Table). However, at least a household member of the 40% of the househlds have gone once to the forest in a year (Table).

DISCUSSION

Malaria infections were detected in all villages. The two villages that were very close to the forest fringe (Myo-chaung and Da-nyin-gone) and the other two villages near the foothill (Waing and Kaing-taw-su) were malaria endemic areas because of presence of moderately high children's spleen and infant parasite rates (Table) and the finding of An. dirus from the nearby woodcutting camps situated in the deep forest or An minimus in the villages at the time of survey.(Myo Paing, personal communication). The remaining villages (Hle-lun-gu, Kyun-net-kone and Sein-gyi-yo) may not be malarious as no efficient mosquito vectors were caught at the time of study. The relatively high spleen and infant parasite rates in Hle-lun-gu may be due to moving back to the village of the families who had worked temporarily in farms near the forest fringe.

The majority of the people residing very close or close to the foothill travelled most during the monsoon while those some distance away spent their nights in the forest during the dry seasons. Similarly, the closer the village to the foothill, the longer a forest traveller stayed in the forest. Thus, population movement to forested foothill from the plain villages might play an important role in contracting malaria, as seen in Hle-lun-gu, kyun-net-kone and Sein-gyi-yo villages.

There are three secondary roads connecting the towns and the respective study foothill villages. From some focus group interviews, it was known that during the summer, many bullock carts and some people on foot from far and near villages converged to the Yoma in a very long procession during day and night for collecting bamboo, thatch leaves and firewood. During the monsoon, the creeks arising from the Bago Yoma are flooded with water, and are used for drifting bamboo in the form of rafts down the stream with a few persons riding on each raft. Thus, there are different types of travel between the forest in the foothill and the far-and-near villages. These different patterns of migration will definitely favour acquisition of malaria infections, transmission and spread of malaria in the region.

In general, the population mobility in the Bago Division is a circulatory type(i.e. population move from place of residence and eventually return to it) like those in Thailand (5) and Bangladesh (6). This pattern is quite different from those movements in many African countries where the mobility usually has spatial characteristics i.e. population move from place to place (7,8).

For effective reduction of morbidity and mortality due to malaria in the region, it is strongly suggested that operations research on the management and control of malaria at the community level through primary health care approach should be studied in consideration of these various types of high risk group of forest travellers.

Table. Information on study villages by survey period, distance from Bago Yoma, population, malaria endemicity indicators and forest -travelling in Bago Division

Survey site	Survey period	Township	Village	Distance from Bago Yoma(km)	No. of house-holds	No. of popula-tion	Spleen rate* 2-9Yrs	Infant parasite rate*	Annual percentage of forest-travelling household	Annual duration of stay per forest traveller(days)
1	25-28 Aug , 1983	Tharyar-waddy	Hle-lun-gu	16	257	1109	62.0	49.9	71.2	45.2
2	9-14 Nov , 1983	Kyauk-taga	Myo-chaung	0.5	119	570	63.0	37.5	71.4	172.1
			Da-nyin-gone	1.6	107	491	43.0	17.4	53.3	83.1
3	25-29 Jan, 1984	Okpo	Waing	5	105	509	36.4	22.5	65.7	47.8
			Kaing taw-su	5	99	524			67.6	51.2
4	28-29 Feb, 1984	Gyo-pin-kauk	Kyun-net-kone	20	27**	137	0	26.1	40.07	12.5
			Sein-gyiyo	20	33**	187			45.5	13.6

* Data form Parasitology Research Division, Department of Medical Research
** Based on samples

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REFERENCES

1. Department of Health. Primary Health Care and Basic Health Service, programme proposal. People's Health Plan I(1978-1982) Rangoon, 1977.
2. Department of Health. Disease Control Programme, programme proposal. People's Health Plan II(1982-1986), Rangoon, 1981.
3. Department of Health. Disease Control Programme, programme proposal. People's Health PLan III (1986-1990), Rangoon, 1985.
4. Vector Borne Disease Control. Malaria situation in Burma, 1977-1982. Department of Health, Rangoon, 1983.
5. Ismail, I.A.H., Notananda, V. and Schepens, J. Studies on malaria and responses of Anopheles balabacensis balabacensis and Anopheles minimus to DDT residual spraying in Thailand. Part I. Pre-spraying observations. Acta tropica, 1974; 31:129-164.
6. Rosenberg, R. and Maheswary, N.P. Forest malaria in Bangladesh . Parasitology. American Journal of Tropical Medicine and Hygiene, 1982; 31: 175-182.
7. Molineaux, L. and Gramiccia, G. The Garki Project: research on the epidemiology and control of malaria in the Sudan Savana of West Africa. World Health Organization, Geneva, 1980; 241-245.
8. Prothero, R.M. Malaria: socio-demographic and geographical problems. In: Proceedings of the Indo-UK workshop on malaria, New Delhi, November 14-19, 1983; 1-52.