SEATO MEDICAL RESEARCH STUDY ON ARBOVIRUSES

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1. Title: Epidemiology of Thai Hemorrhagic Fever

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Objective:

To determine the factors which influence the occurrence and spread of mosquito borne hemorrhagic fever in Thailand.

Description:

Data on hospitalized hemorrhagic fever cases in Bangkok-Thonburi hospitals was collected by monthly visits to each hospital by public health nurses in the same manner as had been used since 1962. Reports on hemorrhagic fever cases occurring outside of Bangkok were requested from hospitals. Additional data was available from Department of Public Health records of reports from provincial health officers.

Reports of large or unusual outbreaks were investigated by a team consisting of at least one physician and 2 public health nurses. Attempts were made to collect clinical and epidemiologic information and obtain specimens for virologic studies.

Progress:

Hemorrhagic fever (HF) continues to be a major cause of illness in Thai children. Figure I shows the cases admitted to Bangkok-Thonburi Hospitals by month for 1962-1965. The pattern of severe epidemics alternating yearly with milder epidemics has continued since 1958. However, a significant new trend is appearing. The numbers of cases in the interepidemic years i.e. 1961, 1963, 1965 has steadily increased since 1958.

The peak incidence in 1965 occurred in September, two months later than in years 1962 to 1964. Numbers of cases of HF in November and December were higher in 1965 than in the same months of any previous year. This continued occurrence of cases during the dry months extended into early 1966 with 210 and 234 cases in January and February 1966 respectively. The reason for this is not apparent; however, since the figures for 1962 to present have been obtained by the same method and personnel, the changes occurring are probably real.

Analysis of the distribution of hospitalized HF cases by age groups, as shown in table 1, reveals a consistent pattern from year to year with the peak occurring at 3-6 years of age and 48 to 54% of the cases occurring in children under 5. The case fatality rate in 1965 was 3.9%, compared to 4.7%, 8.7% and 5.2% for 1962, 1963 and 1964 respectively.

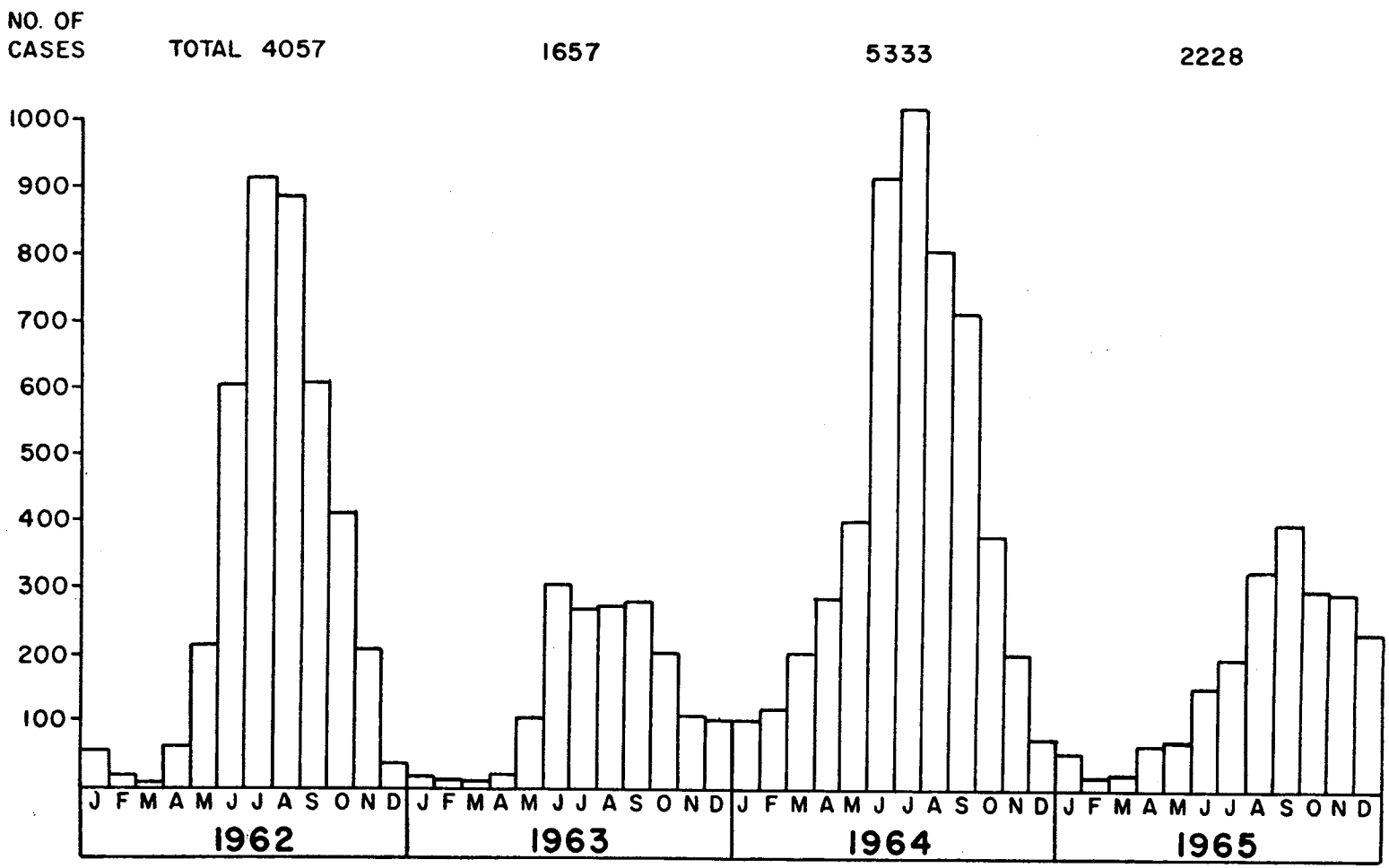

FIG. I CASES OF THAI HEMORRHAGIC FEVER ADMITTED TO BANGKOK AND THONBURI HOSPITALS, 1962—1965.

Table 1. Number and percentage distribution of hospitalized Thai Hemorrhagic Fever cases by age groups, Bangkok-Thonburi, 1962-1965.

Year

1962				1963			1964			1965		
Age-Group	No.	%	cum %	No.	%	cum %	No.	%	cum %	No.	%	cum %
1 year	467	11.5	11.6	203	12.3	12.3	490	9.2	9.2	233	10.5	10.5
1 - 2 ,,	262	6.5	18.1	121	7.3	19.6	314	5.9	15.1	156	7.0	17.5
2 - 3 ,,	375	9.2	27.3	178	10.7	30.3	479	9.0	24.1	213	9.6	27.1
3 - 4 ,,	490	12.1	39.4	199	12.0	42.3	645	12.1	36.2	269	12.1	39.2
4 - 5 ,,	472	11.6	51.0	194	11.7	54.0	631	11.8	48.0	284	12.7	51.9
5 - 10 ,,	1,565	38.5	89.5	613	37.0	91.0	2,110	39.6	87.6	837	37.6	89.5
10 - 15 ,,	388	9.6	99.1	140	8.4	99.4	607	11.4	99.0	231	10.4	99.9

* cum% - Cumulative percentage

Over 2000 cases of hemorrhagic fever were reported by provincial health officers outside of Bangkok in 1965 with the majority of the cases occurring in central (874 cases) and southeast (614 cases) Thailand. Virologic confirmation of dengue infection in HF cases was obtained from cases in Chiengmai, Saraburi, Roi-ed, Korat, Praplinklao, Mahasarakam and Nakornsrithamarat.

Further spread of hemorrhagic fever southward was observed in 1965. The provincial hospital at Nakornsrithamarat reported HF cases for the first time. Clinical and virologic observation on 21 cases from the city of Nakornsrithamarat confirmed the diagnosis. Five strains of dengue viruses were isolated from patients during this outbreak. Three strains were type 3 dengue and two strains were type 2,5 dengue. The HI and CF titers on the dengue HF cases indicated previous exposure to dengue virus in most cases. This is the furthest south that HF has been documented in Thailand.

Another indication of the spread of HF was an outbreak of 10 cases on the island of Koh Samui in the Gulf of Thailand off Surat Thani. The population of the island, approximately 30,3000, is well known to the two physicians on the island and the 10 cases of HF observed in December 1965 were the first seen in the experience of these physicians who have been on the island for over 10 years. Serologic studies on 9 cases indicated that the disease was due to dengue virus and the clinical descriptions of the cases were compatable with HF. One case died of shock. The cases occurred in children between 1 and 5 years of age.

Type 1,6 dengue virus was isolated from the serum of one patient. The HI and CF antibody levels of the patients indicated previous exposure to dengue viruses.

A preliminary serologic survey of 53 children, age 1 to 10, from the village showed a prevalence of HI antibody to dengue and chikungunya virus of 67% and 74% respectively. The high prevalence in this inadequate sample suggests that dengue was widespread on the island before the HF cases appeared.

A survey done by the department of Entomology indicated that Aedes aegypti and Aedes albopictus were common throughout the populated sections of the island.

The relatively stable population of the island and the anticipation of more HF cases during the summer monsoon season offered an opportunity for a prospective study of HF. Serum specimens were collected from 664 children, age 1 to 12, in the village of Ang Tong on Koh Samui. This sample represents an estimated 85% of the village children in that age group. Through the assistance of the local physicians, close surveilance for HF will be maintained and individual cases studied in detail. At the end of one year, serum specimens will be collected again from this group. It is hoped that the preinfection serologic status of HF cases can be studied and that the occurrence of clinical HF cases can be compared with infection rates in this group.

Summary:

Dengue Hemorrhagic fever continues to occur in yearly epidemics in Bangkok and other areas of Thailand. Further spread southward toward the Malaysian bordor was observed in 1965. Three types of dengue viruses were found to cause HF in southern Thailand. Preliminary studies of a HF outbreak on the island of Koh Samui indicated that dengue virus infection was widespread among children prior to the occurrence of dengue hemorrhagic fever cases.