---Preliminary Notes---

Influenza in South-East Asia

Masakazu Takahashi*, Yasue Takeuchi**, Izumi Yoshikawa***, Yasuhiro Shimizu****, Kiyoaki Satsuta***, Hideo Noriki***, and Yukio Yamazi****

* Research The Institute of Gerontology, 
*** Department of Hygiene and Public Health, 
**** Department of Microbiology and Immunology, Nippon Medical School 
** The Division of Virology and Rickettsiology, National Institute of Health, Japan

Influenza is ubiquitous on the earth. It occurs in sporadic intermediate form, in periodic epidemics, and in pandemic form. In the temperate zone, the epidemic tends to occur in winter. It is considered that the virus may survive during the interepidemic period through subclinical or mild infection occurring sporadically. In order to understand how the virus infection recurs in the temperate epidemic zone, a hypothesis has been presented by Fukumi3 that the virus may survive through infections occurring sporadically in the tropical virus-reservoir zone. Several virological and epidemiological studies have been published on influenza in Thailand7~9,11,13~17 which is located in the tropical zone. In South-East Asian countries, a year is divided into three seasons, i.e., hot (March to June), rainy (July to October), and cool (November to February) seasons. In this paper, the outbreak of influenza in Thailand is analyzed in relation to the climatological data and a brief discussion is conducted as regards that of influenza in Manila.

Fig. 1 shows the monthly distribution of the reported case number of influenza in Thailand from 1975 to 1980. The case number increased every year during the period of June to November, i.e., the rainy season, except the year 1978, in which the increase occurred in February. In each year, the smallest monthly case number is 10 to 29% of

![Fig. 1 Monthly distribution of reported case numbers of influenza in Thailand, 1975~1979, modified from (18).](image-url)
the largest monthly case number, (but the percentage is 0 to 0.04% in Japan during the period of 1975 to 1979). This would mean that influenza tends to occur with less preference as to the season in Thailand than in the temperate zone where the epidemic occurs predominantly in winter months. This tendency was suggested to exist also in the case of parainfluenza by Sugiyama et al., who studied seroepidemiology of the virus in Thailand.

According to our unpublished data, influenza virus was successfully isolated from 5.4 to 9.7% of suspected patients in various parts of Thailand in May, 1980, whereas from 18.5 to 25.8% in August 1979 and 1980. The reported case number in May was 1/3 and 1/7 of those in August, 1979 and 1980, respectively (Fig. 1). The correspondence of the figures between the case number and the frequency of the isolation from the suspected patients supports the idea that the disease occurs predominantly during the rainy season in this country, though the predominance is not so definite as in Japanese winter. In contrast, the frequency of the virus isolation in Manila was 38.9% in May and 0% in August, 1980 (unpublished data). These data would suggest the presence of different causative agents of the acute respiratory illnesses in different areas and periods. However, the specimens for the virus isolation were obtained only during a few days in each month. Accordingly, a further study is necessary in order to draw a final conclusion.

Fig. 2 illustrates in graphs the climatological data of Chiang Mai (Northern Thailand), Bangkok (Central Thailand), Songkhla (Southern Thailand), and Manila (Philippines). These data show that seasonal changes of temperature are conspicuous in Chiang Mai, but not in other areas, and that seasonal variations of relative humidity are observed in Chiang Mai and in Manila, but not in Bangkok or Songkhla. Rainfalls generally increase from May to October in Chiang Mai, Bangkok and Manila. But in Songkhla there are plentiful rainfalls from October to December. Consequently, it is not clear whether the occurrence of influenza is related to the climatical conditions in these areas.

Fig. 2 Climatological data (mean) at Chiang Mai, Bangkok, Songkhla, 1951~1975, and Manila, 1951~1970, modified from (1), (2) and (10).
But rainfall and the number of the rainy days increase sharply in May, and therefore could be related to the reported seasonal increase of the case number in Junes of most years in Thailand.

In Thailand, houses, schools, offices and public transportation facilities are as a rule well ventilated because of the warm weather. In this country, the population per unit area is generally small. These living conditions may not favor the air-born viral infection with droplet nuclei. Furthermore, the high humidity of 60% or more may be harmful for the virus to survive in the air. On the other hand, a lower level of the antibody to influenza in Thai people, as compared with that in Japanese, has been reported. This suggests that the low antibody barrier in tropical countries facilitates the survival of the virus through sporadic infections occurring during the major portion of each year.

REFERENCES


(Received for publication, May 11, 1981)