

Seroepidemiologic Survey of *R. tsutsugamushi*
Infection in a Rural Thai Village

Principal Investigators : David E. Johnson, MAJ, MC
John W. Crum, MAJ, MSC

Associate Investigators : Suvath Hanchalay, B.A.
Chirapa Eamsila, 1st Lt, RTA
Robert S. Kennedy, MSG

OBJECTIVES :

1. To determine the prevalence of antibody to *R. tsutsugamushi* in a well-defined rural Thai population.
2. To determine strain types of *R. tsutsugamushi* present and infective in Thailand.

BACKGROUND : Ban Tablan, Prachinburi Province, Thailand, is a relatively isolated rural village approximately 250 km. northeast of Bangkok. The population is primarily engaged in subsistence agriculture, hunting and logging activities. The living quarters are elevated wood and thatch buildings with partially closed in sleeping areas. Deep evergreen forest penetration is confined to the adolescent and adult males during logging activities, but fruit-gathering by the women and play activities by the children allow some thin forest penetration by all members of society. Open sandals and clothing allowing bare arms and legs are common among all villagers.

METHODS : Sera were collected in October-December 1976 in conjunction with a seroepidemiologic survey of the entire village. A 20% random sample, stratified by age, was selected.

An indirect immunofluorescence technique was used to assess all serum for antibody (1). Antigen, Karp, Kato and Gilliam strains, was obtained from the Dept. of Rickettsiology, USAMRU Institute for Medical Research, Kuala Lumpur, Malaysia, as a 20% yolk sack membrane suspension prepared from specific pathogen-free hen's eggs. Serum was first screened at an initial 1:50 dilution against an antigen pool of the three strains. Positive screen specimens were subsequently titered from 1:50 against the antigen pool and the individual antigens. The fluorescent conjugate used was a horse immunoglobulin anti-human immunoglobulin. Readings of the fluorescence were performed with a Leitz Orthoplan research microscope equipped with the fluorescence technique objectives, either vertical or transmitted light, and at 40X dry power. Filters and light sources were combined to produce an ocular maximum fluorescence intensity close to 510 millimicrons.

RESULTS : The prevalence of antibody to *R. tsutsugamushi* in this Thai village is shown in Table 1. Overall, nearly two-thirds of villagers had evidence of antibody. For females, the prevalence of antibody did not change significantly between age groups. However, the prevalence of antibody in males 15 years of

Table 1. Prevalence of Antibody to *R. tsutsugamushi* in Residents of Ban Tablan, Thailand, by Indirect Immunofluorescence Test 1976

Age	MALE		FEMALE		TOTAL	
	No. of individuals tested	No. (%) of individuals positive	No. of individuals tested	No. (%) of individuals positive	No. of individuals tested	No. (%) of individuals positive
1-4	8	4(50)	8	6(75)	16	10(63)
5-9	17	6(35)	13	9(69)	30	15(50)
10-14	10	3(30)	8	5(63)	18	8(44)
15-19	10	9(90)	11	8(73)	21	17(81)
20-29	10	8(80)	18	13(72)	28	21(75)
30-39	11	10(91)	20	13(65)	31	23(74)
40-49	12	10(83)	15	10(67)	27	20(74)
50-59	12	11(92)	13	9(69)	25	20(80)
60+	8	7(88)	9	6(67)	17	13(76)

age and older was significantly different from the younger males (0.873 vs 0.371; $p < 0.001$). The prevalence of antibody in these younger males was also considerably less than that of their female contemporaries (0.690, $p < 0.02$).

Of the 147 positive specimens, 122 had two or more strain titers that were indistinguishable. Only 25 had either a monospecific positive titer (4) or a single titer level four or more times greater than any other positive titer (2) (21). Table 2 presents the distribution of serologic results over the three prototype strains of *R. tsutsugamushi*. Twelve of the type specific titers were in females, 1 to 53 years. The age range of the 13 males were exactly the same. The geometric mean titer (GMT) of the various age groups showed only negligible differences and demonstrated no consistent pattern or progression by age. There was no difference between the overall level of antibody titers in males and females, but females tended to have a slightly lower GMT than their male contemporaries.

A manuscript of this (completed) project has been submitted for clearance.

REFERENCES :

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2. Bourgeois, A.L., Olson, J.G., Ho, C.M., Fang, R.C.Y., Van Peenen, P.F.D. Epidemiological and serological study of scrub typhus among Chinese military in the Pescadores Islands of Taiwan. *Trans. Roy. Soc. Trop. Med. Hyg.* 71: 338-42, 1977.

Table 2. Results of Indirect Immunofluorescence Serology
Ban Tablan, Thailand, 1976

		Kato	Gilliam
Total positive titer	147	141	141
Total type specific titers	13	2	10
GMT of positive titers	1:263	1:189	1:188