

TREPONEMATOSIS IN SINGAPORE*

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The control of treponemal diseases still remains a major public health problem in many tropical areas of the world, and although penicillin has made complete eradication a practical possibility, it would take many years in poorer countries to bring about even partial control. Yaws and venereal syphilis are the only treponemal infections found in Malaya.

YAWS

The earliest reference to the occurrence of yaws in the Malay Archipelago was made by Bontius (1718), who seems to have recognized it in the Molucca Islands as the "Amboina Pocks". Marsden (1811), in his history of Sumatra, mentioned a disease called *Nambie* by the natives, which many years later was described as the *polypapilloma tropicum* of Java by Charlouis (1897). Barker (1898) of the Sarawak Civil Service first identified the *Puru* of Kuching as yaws, and in the same year Connolly (1898) of the Federated Malay States Civil Service published a memorandum in the *British Medical Journal* on the occurrence of yaws in the district of Kinta. Daniels (1904), Director of the Institute of Medical Research at Kuala Lumpur, included yaws among the common diseases of the Malays. Although yaws has perhaps been endemic in Malaya from the early times of unrecorded history, there are few if any other direct references to the prevalence of the disease in the Malay peninsula in the early part of the 20th century.

The true incidence of the disease in the Federation of Malaya is difficult to assess, as there seem to be foci of endemicity in the rural areas of practically every state, especially among the Malays of the riverine villages. It is much more prevalent in the Eastern States of Kelantan and Trengganu, where a

National Health Unit examined 511,603 people between 1954 and the end of 1958, and found 63,209 cases of yaws, a prevalence rate of just over 12 per cent. (Personal communication from Dr. M. Din, A.D.M.S., Federation of Malaya).

Yaws is not endemic in Singapore, and the few patients seen after the last war, had all been imported cases either from Indonesia or from the Federation of Malaya. For the years 1954 to 1958, the number of cases of yaws diagnosed in the Singapore Social Hygiene Clinic was 65, 53, 9, and 15 respectively.

SYPHILIS

In Singapore syphilis appears to have been entirely imported. When the port was founded in 1819 by Sir Stamford Raffles, there were only 150 Malay inhabitants and the whole island of 220 square miles was covered with forest. Since then hundreds of thousands of people have come in from neighbouring countries, and the present population of 1,500,000 comprises 75.4 per cent. Chinese, 13.6 per cent. Malayasians, 8.6 per cent. Indians and Pakistanis, and 2.4 per cent. of 25 other different nationalities (1957 Census).

The first legislative measure against venereal disease was promulgated in 1872 as the Women's Contagious Diseases Act, under which all women suspected to be suffering from V.D. could be segregated and treated in special wards in the hospitals. Free V.D. clinics were established by the government in 1926. A great step forward in social legislation was taken in 1930, when the Women and Girls Protection Act was passed abolishing brothels. As in Great Britain, there was no legislation with regard to notification, compulsory ante-natal or pre-marital blood tests, or treatment of infected or suspected individuals. In the post-war era, facilities for diagnosis and treatment have been enlarged and mobile units have been organized to examine and

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treat women and children in Maternity and Child Welfare Centres in the rural areas and men in rural clubs. An epidemiological unit with twelve field workers to trace defaulters, prostitutes, and infected family contacts has been established. Progress in the control of early syphilis is shown in Table I which was compiled from the admission records of the Social Hygiene Clinics as reported in the Annual Medical Reports (1954-58).

TABLE I
INCIDENCE OF EARLY SYPHILIS, 1927-58

Year	Early Syphilis			Total No. of V.D. Cases	Estimated Population
	Primary	Secondary	Total		
1927	2,570	2,596	5,166	14,106	532,296
1949	648	2,941	3,589	10,460	980,818
1950	819	1,046	1,865	8,983	1,015,453
1955	88	28	116	5,088	1,210,534
1958	125	49	174	5,233	1,514,900

It shows a remarkable improvement for an island port like Singapore which is subject to incessant re-infection from travellers and migrants, but there are no grounds for complacency as syphilis is still

endemic in the area, and the primary and secondary cases have actually increased since 1955. For the first half of 1959, fifty cases of primary and fifteen of secondary syphilis have been reported.

Marital Syphilis.—Since 1950, the screening of the families of infected married persons has been carried out with some diligence, and at the end of 1958 there were 3,377 syphilitic families on the register of the epidemiological unit. Both husband and wife were found to be infected in 675 families (20 per cent.). The infection rate in wives was higher (72 per cent.) than that in husbands (54 per cent.). According to the 1957 Census there were about 300,000 families in Singapore, and it seems that over one in a hundred has at one time or another been infected with syphilis.

Infantile Syphilis.—The reported number of infected babies below the age of one year in 1950 was 137, about 13·7 per 100,000 of the population (Figure). In 1958, there were only eight such cases (an incidence of just over 0·5 per 100,000), but there seems to have been a recrudescence as fourteen cases were treated during the first 6 months of 1959, which means a rise of 1·8 per 100,000 per annum.

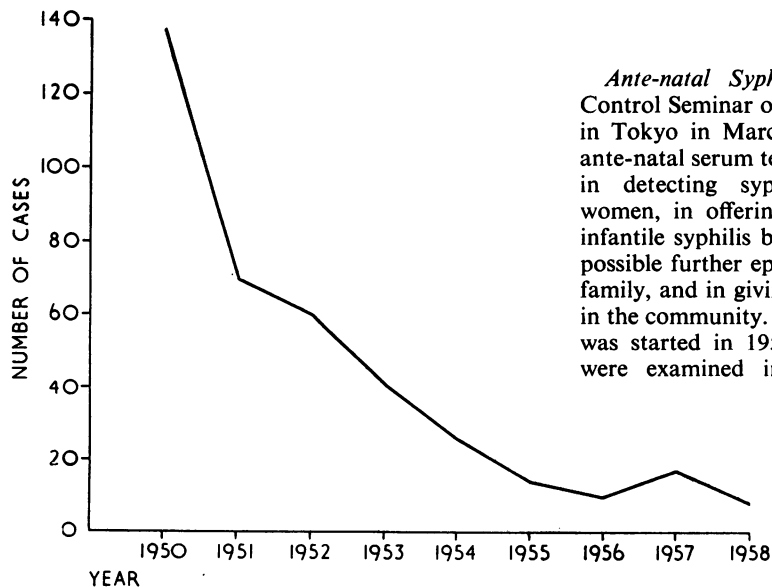


FIGURE.—Cases of infantile syphilis, 1950-58.

Ante-natal Syphilis.—At the Venereal Disease Control Seminar of the Western Pacific Region held in Tokyo in March, 1958, it was emphasized that ante-natal serum testing served a quadruple function in detecting syphilis in young sexually-active women, in offering the opportunity of preventing infantile syphilis by treating the mother, in making possible further epidemiological investigation in the family, and in giving an index of syphilitic infection in the community. This practice of ante-natal testing was started in 1951, and 11,448 pregnant women were examined in 1958. Although the rate of positive STS in this group has declined steadily from 5·4 per cent. in 1951 to 0·7 per cent. in 1958, there is evidence of continued active transmission of syphilis in the young, as the positivity rate in primiparae even in 1958 was about 1·4 per cent. (Table II, opposite).

Other Types of Syphilis.—There has been a steady decline in early latent, late latent, and late symptomatic syphilis during the last 5 years (Table III). Only 132 cases of the last were reported to the clinics in 1958, and these may be classified as follows:

Skin, Bones, and Joints ..	39
C.V.S.	19
G.P.I.	16
Tabes	3
Other Neurosyphilis	55

TABLE III
SINGAPORE SOCIAL HYGIENE CLINICS SYPHILITIC INFECTIONS, 1954-58

Year	Type of Syphilis							Total
	Primary	Secondary	Early Latent	Late Latent	Late Symptomatic	Con-genital (over 1 year)	Infan-tile	
1954	104	39	418	943	301	66	25	1,896
1955	88	28	289	977	209	42	14	1,647
1956	128	41	182	650	155	60	10	1,226
1957	172	33	249	577	163	65	17	1,276
1958	125	49	168	528	132	25	8	1,035

TABLE II
RESULTS OF STS IN ANTENATAL CASES EXAMINED IN SUBURBAN AND RURAL MATERNITY AND CHILD WELFARE CENTRES IN SINGAPORE, 1951-58

Year	Nationality	Total Antenatal Examinations	Primiparae				Multiparae				Total Per cent. Positive
			No. of Cases	Positive		No. of Cases	Positive				
				No.	Per cent.		No.	Per cent.			
1951	Chinese	936	522	12		414	32			5.4	
	Malayasian	313	174	7		139	15				
	Indian	110	46	3		64	4				
	Others	4	1	—		3	—				
	Total	1,363	743	22	3	620	51	8.2			
1952	Chinese	1,186	727	16		459	20			3.8	
	Malayasian	469	270	10		199	16				
	Indian	121	63	1		58	3				
	Others	8	5	1		3	1				
	Total	1,784	1,065	28	2.6	719	40	5.5			
1953	Chinese	2,983	781	19		2,202	85			4.4	
	Malayasian	1,356	354	19		1,002	66				
	Indian	347	97	2		250	19				
	Others	22	5	—		17	—				
	Total	4,708	1,237	40	3.2	3,471	170	4.9			
1954	Chinese	3,521	642	10		2,879	116			4.3	
	Malayasian	1,520	284	6		1,236	81				
	Indian	635	124	3		511	28				
	Others	51	9	—		42	3				
	Total	5,727	1,059	19	1.8	4,668	228	4.8			
1955	Chinese	3,479	561	15		2,918	79			2.8	
	Malayasian	1,435	238	5		1,197	41				
	Indian	684	128	4		556	16				
	Others	18	3	—		15	—				
	Total	5,616	930	24	2.5	4,676	136	1.2			
1956	Chinese	3,660	531	12		3,129	30			1.4	
	Malayasian	1,882	281	11		1,601	21				
	Indian	592	143	2		449	15				
	Others	14	—	—		14	—				
	Total	6,148	957	25	2.6	5,193	66	1.2			
1957	Chinese	4,913	606	3		4,307	37			1.4	
	Malayasian	1,933	265	9		1,668	29				
	Indian	692	128	4		564	12				
	Others	58	5	—		53	—				
	Total	7,590	1,004	16	1.6	6,592	78	1.2			
1958	Chinese	7,614	1,023	12		6,591	32			0.7	
	Malayasian	2,810	407	8		2,403	30				
	Indian	948	161	2		787	1				
	Others	76	15	—		61	—				
	Total	11,448	1,606	22	1.4	9,842	63	0.06			

The percentage incidence of these late conditions during the last 5 years, set out in Table IV, shows a relatively higher prevalence of neurosyphilis in 1958.

TABLE IV
PERCENTAGE INCIDENCE OF LATE SYMPTOMATIC SYPHILIS, 1954-58

Year		1954	1955	1956	1957	1958
Type of Late Symptomatic Syphilis	Neurosyphilis . .	35.9	40.2	40.0	43.6	56.0
	Cardiovascular	13.3	22.0	14.2	11.0	14.4
	Skin, Bones, and Joints	50.8	37.8	45.8	45.4	29.6

RESULTS OF TREATMENT

Treponema pallidum seems to be as sensitive to penicillin in Singapore as in any other part of the world. In 1950 a total of 55 syphilitic pregnant women in various stages of pregnancy and disease gave birth to healthy infants, although some were born prematurely, and 96 per cent. of the cases of infantile syphilis became sero-negative within 1 to 8 months of treatment (Ram, 1951).

The results of an analysis of cases of early and late syphilis followed for several years is shown in Table V.

TABLE V
RESULTS IN CASES OF EARLY AND LATE SYPHILIS TREATED WITH PENICILLIN AND FOLLOWED UP FOR FROM 2 to 7 YEARS

Type of Syphilis	Total No. of Cases	Negative Serology		Percentage Cure
		Time	No. of Cases	
Primary (STS+) . .	350	Within 2 yrs	320	90
Secondary	252		192	76
Early Latent . . .	859		576	67
Late Latent	2,100	Within 5-7 yrs	824	40
Late Symptomatic . .	879		477	54

REACTIONS TO PENICILLIN

An average of 180,000 injections of various types of penicillin has been given annually during the last 5 years to patients with venereal and non-venereal disease in the Social Hygiene Clinics of Singapore. One death from anaphylactic shock occurred in 1955 in a middle-aged patient with cardiovascular syphilis about 20 minutes after receiving the 30th injection of 2 ml. PAM. The diagnosis was confirmed *post mortem*. In 1958, there were seventeen untoward reactions to penicillin, none of which was of anaphylactoid nature; five were in V.D. cases and the other twelve occurred in patients being treated for skin disease. In three cases, the patient

complained almost immediately of giddiness, palpitation, and a feeling of suffocation; other reactions consisted of skin rashes and urticaria and were of the delayed type. In 1959, there were two cases of anaphylactic shock after the first injection, one after P.A.M. and the other after crystalline penicillin. The former occurred in a patient with gonorrhoea and the latter in a skin case. There was no history of previous injections of penicillin in either patient, but they might have been sensitized by other injections delivered from a syringe previously used for penicillin in some other government or private clinic (hidden sensitization).

INFECTION IN PROSTITUTES

Since 1950, promiscuous women have been offered weekly, fortnightly, or monthly injections of penicillin (PAM or Bicillin) as a form of continuous treatment to diminish the number of infections in their consorts. By the end of 1958, 1,248 women had had such treatment. Most of the women who were found to be infected accepted the full course of treatment appropriate to the particular disease. Many of these women have left the country; in 1958, only 594 attended the clinic, and the following infections were found amongst them:

Early Syphilis	39
Late Syphilis	75
Mixed Infections and Syphilis	169
Gonorrhoea	170
No Disease	141
Total	594

It is evident that 76 per cent. were infected with one disease or another, but only 6 per cent. showed lesions of early syphilis. In thousands of penicillin injections given to this highly infected group, the only outward reaction was an occasional local abscess at the site of the injection, which generally contained oil and proved sterile on culture.

CONCLUSION

The population of Singapore, originally largely immigrant, is now more stable, 65 per cent. at present being born locally. The ratio of females to males has increased from 406 per thousand in 1911 to 895 per thousand in 1957. The group chiefly at risk (15 to 44 years) consists of 284,637 females and 320,848 males and constitutes over 42 per cent. of the population with an excess of 36,000 males over females. Transients afloat each day in the port of

Singapore number 3,466, and there are also 25,860 members of the Armed Forces in Service Establishments. The excess of males in the most virile age group necessarily creates a demand for more females, which is provided, as in other countries, by promiscuous women. About 200,000 seamen (of whom 24,000 are locally born) and 75,000 other tourists visit Singapore every year and therefore both foreign and local strains of treponemata are continually being imported and exported.

Syphilis, together with many other infectious diseases, has been brought to Singapore by immigrants, and although the incidence of early syphilis has diminished from 970 in 1927 and 366 in 1949, to a mere 11 per 100,000 in 1958 (a decrease of 99 per cent. from the 1927 level and equivalent to about 3 per cent. of the incidence in 1949), the disease has now become endemic in Singapore and about 150 fresh cases of primary and secondary syphilis can be expected each year. Complete eradication would involve not only further intensification of the case-finding activities, but also a much higher degree of international control, which in turn means a well-organized system of diagnosis, treatment, and case-finding at the national level in all countries. The blessings bestowed on mankind by Fleming, Florey, and Mahoney should be brought to fruition by continuous and relentless effort towards the eradication of all kinds of treponematoses.

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Tréponématoses à Singapour

Conclusion

La population de Singapour, à l'origine immigrante en grande partie, est maintenant plus stable: 65 pour cent sont maintenant natifs de l'endroit. La proportion des femmes s'est accrue de 406 pour mille en 1911 à 895 pour mille en 1957. Le groupe le plus en danger (de 15 à 44 ans) comprend 284.637 femmes et 320,848 hommes et constitue plus de 42% de la population, avec une majorité des hommes sur les femmes de 36.000. La population quotidienne mobile dans le port de Singapour est de 3.466 et il y a aussi 25.860 membres des Forces Armées dans des établissements militaires. La majorité des hommes du groupe d'âge le plus viril crée nécessairement une demande de plus de femmes, qui est pourvue, comme dans les autres pays, par des femmes promiscues. Environ 200.000 marins (dont 24.000 natifs de l'endroit) et 75.000 autres personnes de passage visitent Singapour chaque année, en conséquence, des types à la fois étrangers et locaux de tréponème sont sans cesse importés et exportés.

La syphilis, avec tant d'autres maladies infectieuses, a été introduite à Singapour par des immigrants, et quoique la fréquence de la syphilis précoce ait diminué de 970 en 1927 et 366 en 1949, à simplement 11 pour 100.000 en 1959 (diminution de 99% depuis le niveau de 1927 et équivalent à environ 3% de la fréquence de 1949), la maladie est maintenant devenue endémique à Singapour et on peut s'attendre chaque année à environ 150 nouveaux cas de syphilis primaire et secondaire. Une élimination complète demanderait non seulement une intensification des efforts de détection, mais aussi un bien plus haut degré de contrôle international, ce qui, à son tour, impliquerait un système bien organisé de détection, diagnostic et traitement au niveau national de tous les pays. Un effort continu et infatigable pour la destruction de toutes les sortes de tréponématoses devrait faire fructifier les bienfaits apportés à l'humanité par Fleming, Florey et Mahoney.