

# Venereal diseases in the islands of the South Pacific\*

R R WILLCOX

*From the Department of Venereology, St Mary's Hospital, London*

**SUMMARY** The island territories of the South Pacific vary considerably in area and in size of population; Pitcairn has a population of 100 in two square miles whereas Papua New Guinea has a population of 2 990 000 in approximately 175 000 square miles. Today the whole ocean is traversed by air routes. Recently, the prevalence of gonorrhoea has decreased in the northern region but increased in the eastern and western; in all these regions the reported prevalence exceeds 200 cases per 100 000 population. In an area where yaws was once widespread, syphilis is being increasingly recognised. Although the figures for syphilis are clearly higher because of the greater use of serological screening, many of the reported cases are of early infection. Yaws has been eliminated from most of the South Pacific Islands but is still present in the western region—more than 99% of the reported cases occurring in Papua New Guinea, particularly in the offshore islands.

## Introduction

The reported cases of venereal diseases in the Pacific islands north of the equator have already been considered.<sup>1</sup> International health statistics for the islands of the South Pacific are published by the World Health Organisation and by the South Pacific Commission, a consultative and advisory body set up in 1947 by the six governments then responsible for the administration of the various island territories—namely, Australia, France, the Netherlands, New Zealand, the United Kingdom, and the USA. Since that time the Netherlands have ceased to participate, but as an increasing number of countries achieve independence new participating members are being added—Western Samoa (1964), Nauru (1969), Fiji (1971), Papua New Guinea (1975), and the Gilbert Islands (Kiribati) (1979).

## POLITICAL ATTACHMENTS

Of the 20 islands, or groups of islands, providing data to the South Pacific Commission (figure), five lie in the northern region (of which Guam, the Trust Territory of the Pacific Islands, and half of the Gilbert Islands are north of the equator), six in the eastern region, and nine in the western region, corresponding broadly to Micronesia, Polynesia, and

Melanesia respectively. Their political attachments are shown in table I.

## COMMUNICATIONS

Tourism is vital to the economy in many Pacific islands and is fostered by the airlines which serve them (table II). International air routes in the South Pacific run in a north-east to south-west direction from the USA—by way of Honolulu, or Nadi (Fiji), or both, but less often by way of Rarotonga in the Cook Islands or Pago Pago in American Samoa—to New Zealand and Australia. A transverse route links Papeete (Tahiti) in French Polynesia, Nadi (Fiji), and Noumea in New Caledonia (also French), with extensions on both sides and northwards also through Nauru. These key centres are linked by international flights connecting the islands with the Americas and with Australasia, but these and other airports also provide local flights between adjacent island groups and different points on the island groups themselves. For example, in Papua New Guinea alone (table II), 72 places are served by scheduled air routes (DZ, GV, JX and PX); in French Polynesia (from Papeete, Tahiti), 22 (VT and QE); in the Solomon Islands (from Honiara on Guadalcanal), 22 (IE); in Fiji (from Suva), 12 (FJ and PC); in New Caledonia (from Noumea), 12 (TY); in the New Hebrides (from Espiritu Santo and Port Vila), 11 (IE); in Tonga (from Tongatapu), four (HK); in Western Samoa (from Apia), four (PH); in Guam and the Mariana Islands, three (IL); and in the Cook Islands (from Rarotonga), two (KH).

\*Paper presented at the meeting of the Medical Society for the Study of Venereal Diseases, Lübeck, West Germany, May 1979

Address for reprints: Dr R R Willcox, Tideway, Lonsdale Road, London SW13

Received for publication 4 October 1979

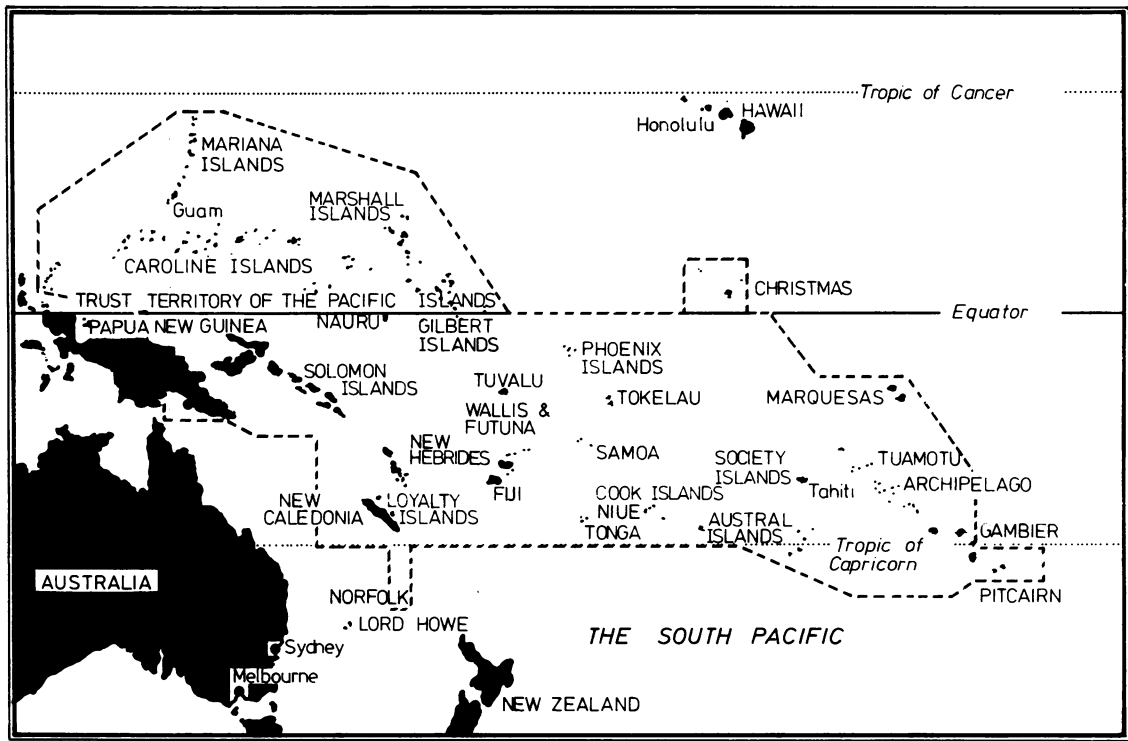


FIGURE Islands of the South Pacific

TABLE I Political attachments of Pacific Islands south of the equator

Political attachment	Pacific Islands*
Independent	Fiji (UK) Kiribati (Gilbert Islands, UK) Nauru (Australia) Niue (New Zealand) Papua New Guinea (Australia) Solomon Islands (UK) Tonga (UK) Tuvalu (Ellice Islands, UK) Western Samoa (New Zealand)
Australia	Lord Howe Islands Norfolk Island
Great Britain	New Hebrides (with France) Pitcairn Islands (including Ducie and Venio atolls and Henderson Island)
Chile	Easter Island San Felix Juan Fernandez
Ecuador	Galapagos Islands
France	French Polynesia New Caledonia New Hebrides (with Britain) Wallis and Futuna Islands
New Zealand	Cook Islands Tokelau

\*Previous administration given in brackets

TABLE II Airlines serving the Pacific Islands south of the equator

Airlines*
External:
Air New Zealand (TE)
Canadian Pacific Air (CP)
Cathay Pacific Airlines (CX)
Lan Chile (LA)
Pan American World Airways (PA)
Qantas Airways (QF)
Union de Transports Aeriens (UT)
Internal:
Advance Airlines (DR)
Air Caledonie (TY)
Air Melanesiae (HB)
Air Nauru (ON)
Air Niugini (PK)
Air Pacific (FJ)
Air Polynesie (DZ)
Air Tahiti (QE)
Bougair (JX)
Cook Island Airways (KH)
Douglas Airways (DZ)
East-West Airlines (EW)
Fiji Air (PC)
Norfolk Island Airways (UG)
Polynesian Airlines (PH)
Solomon Island Airways (IE)
South Pacific Island Airways (HK)
Talair (GV)

\*Codes as per Official Airline Guide<sup>15</sup>

## DEMOGRAPHY

The three regions (northern, eastern, and western) have a total population of 4·8 millions, of which 62·3% (or nearly three millions) live in the single large territory of Papua New Guinea, which covers approximately 175 000 (85·4%) of the 205 000 square miles of the consolidated land mass.

*Northern region*

In the northern region the Trust Territory of the Pacific Islands has both the largest land area and the greatest population (133 000) distributed among those of its 1350 or so coral islets which are inhabited and which extend 4000 miles from east to west and lie just north of the equator; the equally scattered Gilbert Islands have the second largest land area. Both Nauru and Tuvalu cover 10 square miles or less with populations between 7000 and 7400 (table III).

Ocean Island (in the Gilbert Islands) and Nauru, both of which lie just south of the equator, have been heavily mined for phosphates. The rich inhabitants of the latter have a very high prevalence of diabetes.

*Eastern region*

The eastern region covers more than 2·5 times the land area of the northern region and has approximately 1·5 times its population (table III).

The most scattered group of islands, covering some 2·75 million square miles of ocean, is that of French Polynesia, comprising the Marquesa Islands, the Society Islands, the Tuamotu Archipelago, and the Austral and Gambier Island complexes. Their total population is exceeded by that of Western Samoa, a more compact group of two large and seven small islands. The smallest islands in this region are the three coral atolls of Tokelau (population 1600) and Pitcairn Island (and its adjoining atolls) with a population of only 100.

The Galapagos Islands (not a member of the South Pacific Commission) lie almost on the equator to the eastern edge of the region on the same latitude as the coast of Ecuador, to which they belong.

*Western region*

The western region is the largest region in terms of population and land area (both population and size being disproportionately exaggerated by the presence of Papua New Guinea). Even excluding Papua New Guinea, the population and size of the remaining territories are several times greater than those of the other two regions (table III).

The western region contains rich mineral deposits of copper in Bougainville, lately separated from Papua New Guinea, and of nickel in New Caledonia.

TABLE III *Land area and population size of South Pacific Islands*

Region	Estimated population (1978)	Land area	
		km <sup>2</sup>	Square miles
Northern			
TTPi	133 000	1832	707
Guam	90 000	541	209
Gilbert Islands	56 000	690	266
Tuvalu	7400	26	10
Nauru	7000	21	8
Total	293 400	3110	1200
Eastern			
French Polynesia	141 000	3265	1260
Western Samoa	153 000	2935	1133
Tonga	93 000	699	270
American Samoa	31 500	197	76
Cook Islands	18 500	240	93
Wallis and Futuna	10 000	255	98
Niue	3700	259	100
Tokelau	1600	10	4
Pitcairn	100	5	2
Total	452 400	7865	3036
Western			
Papua New Guinea	2 990 000	452 943	174 880
Fiji	607 000	18 272	7055
Solomons	214 000	28 530	11 015
New Caledonia	138 000	19 103	7374
New Hebrides	101 500	11 880	4586
Norfolk Island	1900	34	13
Total	4 052 400	530 762	204 923
Total (excluding Papua New Guinea)	1 062 400	77 819	30 043

**Venereal diseases statistics**

Statistics for syphilis and gonorrhoea in the Pacific Islands are collected and published by the World Health Organisation (together with those in Australia and New Zealand, under the heading of Oceania); the rates are provided by the South Pacific Commission.

The prevalence of both diseases are subject to the usual variables, such as the availability of diagnostic facilities and the accuracy of reporting. Quite often there is a difference (sometimes considerable) in the figures reported by the two international organisations, the reasons for which are not clear.

## PREVALENCE OF GONORRHOEA

The prevalence of gonorrhoea in the entire Southern Pacific area (191 per 100 000 in 1975) was exceeded—among reportable communicable diseases—only by measles and influenza (table IV). In many parts of the region however the diagnosis of gonorrhoea may only be a clinical one and is seldom based on the results of cultures.

*Northern region*

In a previous paper,<sup>1</sup> data from the WHO indicated a rising prevalence of gonorrhoea in Guam and the

TABLE IV Communicable disease in the Pacific Islands<sup>6</sup>

Disease	Rate*	Disease	Rate*
Influenza	3006	Tuberculosis	24
Measles	419	Other meningitis	16
Gonorrhoea	191	Yaws	12
Dengue	170	Meningococcal meningitis	9
Bacillary dysentery	100	Rheumatic fever	8
Amoebic dysentery	73	Tetanus	5
Fish poisoning	39	Leprosy	3
Pertussis	38	Encephalitis	2
Infective hepatitis	35	Typhoid fever	2
Syphilis	34	Poliomyelitis	1
		Diphtheria	1

\*Per 100 000 population

Trust Territory of the Pacific Islands with peaks in 1972 and 1973<sup>3</sup> (G Causse, personal communication, 1978). Data from the South Pacific Commission<sup>5-8</sup> indicate that in the five-year period from 1973 to 1978 the reported number of cases of gonorrhoea decreased but the overall prevalence is still substantial at 266 per 100 000 (having decreased from 438 per 100 000), being particularly high in Guam and in the widespread Trust Territory of the Pacific Islands, where the reported prevalence in 1978 was 374 per 100 000 (table V).

TABLE V Prevalence of gonorrhoea in the South Pacific Islands

Region	No of cases				Rate* (1978)
	1973	1974	1977	1978	
Northern					
TTPI	756	592	479	498	374
Guam	411	270	218	258	287
Nauru	6	4	9	9	129
Gilberts	25	0	30	13	23
Tuvalu	†	†	0	1	14
Total No of cases	1198	866	736	779	
Rate per 100 000	438	303	259	266	
Eastern <sup>5-8</sup>					
Cook Islands	202	156	174	120	649
French Polynesia	226	264	367	408	289
American Samoa	49	48	79	69	219
Western Samoa	240	267	184	290	190
Tokelau				1	188
Niue	7			1	81
Wallis and Futuna	1	1		4	40
Tonga	22	18	3	19	20
Total No of cases	747	754	807	912	
Rates per 100 000	175	172	182	202	
Western <sup>5-8</sup>					
Papua New Guinea	5156	5759	8954	10 386	347
Fiji	811	490	930	1073	177
New Caledonia	165	228	331	244	177
Norfolk Island			29	3	158
Solomon Islands	12	9	377	194	91
New Hebrides	122	99	96	66	65
Total No of cases	6266	6585	10 717	11 966	
Rate per 100 000	202	184	272	295	

\*Per 100 000 population

†Included in figures for Gilbert Islands

*Eastern region*

In the eastern region of the South Pacific Commission the prevalence of gonorrhoea in 1978 also exceeded 200 per 100 000, the highest rate of 649 per 100 000 being returned (as before when it was even higher) by the Cook Islands (table V). Unlike in the northern region, however, the rate had increased from 175 per 100 000 (or by 15.6%) since 1973 (table V).

*Western region*

The World Health Organisation's figures<sup>3,4</sup> for gonorrhoea show an increasing prevalence in Fiji between 1955 and 1971 (with a peak of 1506 cases) and a subsequent decrease to 930 cases in 1977; similarly, the number of cases in New Caledonia increased from 127 in 1968 to 398 in 1976 whereas in the New Hebrides the number rose from 59 cases in 1970 to 276 in 1976.

In data from the South Pacific Commission<sup>5-8</sup> the highest regional rate of 295 per 100 000 was reported from the western region, which showed an increase of 63.9% over five years (table V).

Papua New Guinea, with the highest rate in 1978 of 347 per 100 000, accounted for 86.8% of the reported cases of gonorrhoea in this region (82.3% in 1973).

It is noteworthy that the three cases among the small population of 1900 in Norfolk Island in 1978 gave a prevalence of 158 per 100 000. In the previous year, when there were 29 cases, the prevalence was 1526 per 100 000.

## PREVALENCE OF SYPHILIS

*Regional figures*

Venereal syphilis is emerging as a public health problem in the South Pacific, where yaws was once endemic.<sup>9</sup>

The prevalence in the three regions is shown in table VI. Few cases are notified in the returns each year from the northern region. (No case of syphilis was reported in the Trust Territory of the Pacific Islands up to 1972.) In the eastern region, a high prevalence has been reported from French Polynesia (319 per 100 000 in 1978) whereas the three cases reported in Tonga in 1978 were the first ever recorded in that territory.

In the western region the highest rate in 1978 was 299 per 100 000 in New Caledonia but in 1977 there were 462 cases per 100 000.<sup>7</sup> This rate, like that of French Polynesia, showed almost a 10-fold increase in the rate since 1973. The number of cases in Papua New Guinea (which accounted for 74.9% of the grand total of 4652 cases) had also increased more than threefold since 1973, during which time a 100-fold increase was noted in Fiji.

TABLE VI *Syphilis in the South Pacific*<sup>5-8</sup>

Region	No of cases				Rate* (1978)
	1973	1974	1977	1978	
Northern					
Guam	3	0	4	2	2
TPI	4	1	5	0	0
Other islands†	0	0	0	0	0
Eastern					
French Polynesia	31	76	316	450	319
Tonga	0	0	0	3	3
Other islands‡	0	0	0	0	0
Western					
New Caledonia	31	219	628	412	299
Papua New Guinea	1021	1153	1937	3485	117
Fiji	3	30	143	300	49
New Hebrides	1	0	2	0	0
Solomon Islands	0	0	1	0	0
Norfolk Island	0	1	0	0	0
Total No of cases	1094	1480	3036	4652	
Rates per 100 000	26	34	65	97	

\*Per 100 000 population

†Gilbert Islands

‡American Samoa, Cook Islands, Niue, Pitcairn Island, Tokelau, Wallis and Futuna, and Western Samoa

*Type of case*

Although the number of cases of syphilis has increased more than fourfold, many are latent, discovered as a result of the increasing facilities for serological testing—as in French Polynesia, New Caledonia,<sup>7</sup> and Fiji.

Moreover, 78 cases of syphilis were reported in New Caledonia in 1955 but the annual number fell to five in 1970 before rising again (table VII). Similarly, in Fiji, 48 cases were recorded in 1955—but only three or four in 1966 and 1973—the number then increased rapidly to 143 in 1977.<sup>4</sup> Nevertheless, numerous cases of clinical syphilis have been found in Papua New Guinea, and in fact the first findings in a new epidemic were the clinical cases.<sup>10</sup>

Similarly, in New Caledonia, there has been a large increase in the number of reported cases of both syphilis in all stages (since serological testing became more widely available in 1975) and early syphilis (table VII).

TABLE VII *Syphilis in New Caledonia (cases of early syphilis given as percentage of total)*

Year	Total No of cases	Cases of early syphilis		Other cases
		No	% of total	
1955	78	36	46.2	42
1966	85	1	1.2	84
1970	5	5	100.0	0
1971	12	3	25.0	9
1975	655	310	47.3	345
1976	783	280	35.8	503

Of the 761 cases of syphilis seen at the Dermatovenereological Dispensary in Noumea between 1976 and 1977, 168 (22.1%) were clinical cases. The ratio of clinical cases to the total number may be expected to fall as screening techniques improve and control is established.

The three patients with syphilis (table VI) in Tonga (one male Tongan soldier and two female Tongan prostitutes) had primary syphilis, which was confirmed by both laboratory and serological investigations.<sup>7</sup> By 1977 cases of early congenital syphilis were being observed with increasing frequency in both New Caledonia and Fiji.<sup>11</sup>

There is no doubt that the phenomenon of emergent syphilis is one of increasing importance, particularly as 12 of the 20 island territories have yet to report a single case.

## PREVALENCE OF YAWS

Yaws was highly prevalent throughout the Pacific Islands in earlier years. In 1933, for example, there were only 15 cases of venereal disease in Fiji and 2249 cases of yaws; in 1937, 4500 cases were reported.<sup>12 13</sup> The horrifying effects of yaws in Guam have been recorded by Butler.<sup>14</sup>

Today yaws has apparently been eradicated in many islands but it has not yet completely disappeared; in recent years some cases have been found in the western region—particularly in Papua New Guinea, which accounted for all but three of the 883 reported cases in 1978 (table VIII).

TABLE VIII *Yaws in the South Pacific*<sup>5-8</sup>

Region	No of cases†				Rate* (1978)
	1973	1974	1977	1978	
Papua New Guinea	954	504	930	880	29
New Hebrides	0	3	23	3	3
Fiji	0	1	0	0	0
Solomons	1	0	0	0	0
Tonga	14	3	0	0	0
Trust Territory					
Pacific Islands	1	0	0	0	0
Total No of cases	970	511	953	883	
Rates per 100 000	23	12	20	18	

\*Per 100 000 population

†Nil returns from American Samoa, Fiji, French Polynesia, Gilbert Islands, Guam, Nauru, Niue, Norfolk Island, Pitcairn Island, Tokelau, Tuvalu, Wallis and Futuna, and Western Samoa

In the smaller islands, the improvement in communications, the expanding tourist industry, and the increased number of schools for the local children seem to have led to the disappearance of yaws; if these conditions are maintained the disease is unlikely to return.

An epidemic of tropical ulcer in the Cook Islands in 1976 caused great concern and resulted in the reporting of 276 cases of so-called yaws in 1976 and 463 more in 1978.<sup>7,8</sup> These cases were originally returned as yaws but on investigation the diagnosis was not supported by pathological findings and they have been excluded from table VIII.

### Conclusion

All data relating to the sexually transmitted diseases in the South Pacific as a whole are dominated by those from Papua New Guinea. These will therefore be considered in more detail in the third and last paper in this series.<sup>16</sup>

Particular thanks are expressed to the Secretary General E Macu Salato of the South Pacific Commission for permission to use the maps (which have been modified) and to this organisation, through Dr T Kuberski, and also to Dr G Causse of the World Health Organisation, Geneva, for kindly providing statistical material, and to Dr G Bernard of the Dermatovenereological Dispensary, Noumea, New Caledonia, for his demonstration of clinical material.

### References

1. Willcox RR. Venereal diseases in the islands of the North Pacific. *Br J Vener Dis* 1980;56:173-7.
2. Zimmet P. Diabetes in Pacific populations—a price for westernisation. In: *Proceedings of the Sixth Asia and Oceania Congress of Endocrinology* (Singapore, January 1978), 1978:256-65.
3. World Health Organisation. Gonococcal infections. *Wld Hlth Stat Rep* 1975;28:118, 125.
4. South Pacific Commission. *Annual Summary of the 1973 Infectious Disease Reports*, Noumea, New Caledonia: South Pacific Commission, 1974.
5. South Pacific Commission. *Annual Summary of the Reported Diseases for 1974*, Noumea, New Caledonia: South Pacific Commission, 1975.
6. South Pacific Commission. Reported cases of notifiable diseases for the South Pacific region countries. *Annual Report for the Year 1977*, 1978.
7. South Pacific Commission. Reported cases of notifiable diseases for the South Pacific countries. *Annual Report for the year 1978*, Noumea, New Caledonia: South Pacific Commission, 1979.
8. Willcox RR. The current status of the sexually transmitted diseases with special reference to the South Pacific Region. *Report on Regional Workshop on Cholera and other Epidemic Diseases in the Pacific, 24-28 April 1978*. Noumea, New Caledonia: South Pacific Commission, 1978;63-6.
9. Rhodes FA, Anderson SLJ. An outbreak of treponematosi in the Eastern Highlands of New Guinea. *Papua New Guinea Med J* 1970;13:49-52.
10. Kubenski T. Sexually transmitted diseases in the South Pacific region. *Report on Regional Workshop on Cholera and other Epidemic Diseases in the Pacific, 24-28 April 1978*. Noumea, New Caledonia: South Pacific Commission, 1978;67-8.
11. *Fiji Annual Med Hlth Rep Suva*, 1933.
12. *Fiji Annual Med Hlth Rep Suva*, 1937.
13. Butler CS. *Syphilis Sive Morbus Humanus*. Lancaster, Pennsylvania: Science Press, 1936.
14. *Official Airline Guide*, Hinsdale, Ill, USA: Reuben H Donnelley Corp, 1978.
15. Willcox RR. Venereal disease in the Pacific Islands. III Papua New Guinea. *Br J Vener Dis* 1980 (in press).