

## MODERN TRENDS IN DIAGNOSIS, TREATMENT AND CONTROL OF THE VENEREAL DISEASES\*

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The Republic of Singapore has many of the features recognised as contributing to a rising incidence of venereal disease. Most notable amongst these features are an expanding economy, growing population, a high proportion of young people, urbanisation, the presence of servicemen of several countries, more and more seafarers from many lands, a thriving tourist industry and not least a growing number of prostitutes. It should surprise no one therefore to find that Singapore has a V.D. problem and that it is a matter of concern.

Trying to establish the size of the problem is not easy. Figs. 1 and 2 show the number of cases seen at Middle Road Hospital and the Seamen's clinic in Nelson Road. The expected rises are conspicuous by their absence. In other prosperous countries with modest public V.D. services e.g. the U.S.A. and Japan it is recognised that a large and growing proportion of the venereally infected are dealt with privately. A survey of the private sector was therefore undertaken and Table I shows the response and results. A questionnaire method was used.

The response rate of 62% of 200 private practitioners places restrictions on extrapolating the findings in terms of Singapore's 500 private practitioners. Half the returns were secured following a reminder and they showed fewer cases than the first half. This suggests that amongst the non-respondents the number of cases would have been even less. Further there was great disparity in the numbers reported by individual practitioners. Many gave an estimated number. The respondents therefore reflect a degree of bias which does not permit of any calculation of a maximum number of cases.

At the same time a 62% response of 40% (200) of Singapore's 500 private practitioners allows of confident extension of the findings to the calculation of a theoretical minimum number of cases. Of the several methods available for

this calculation the following formula has been used:—

$$\text{Number reported by 62\% of 200} \times \frac{\text{Total number practitioners (500)}}{\text{Total number on survey (200)}}$$

For example when this is applied to "Female, proven gonorrhoea" in 1969 the minimum total treated would be:—

$$\frac{412}{1} \times \frac{500}{200} = 1030$$

On this basis the theoretical minimum number of cases dealt with by 500 private practitioners in 1969 is shown in Table II. The 10 doctors giving no reply to this section have been taken as giving a nil return. There are of course more than 500 private practitioners in Singapore but a minimum figure has been taken. If the figures available from public clinics and local Commonwealth Forces are added (692 cases in 1969) then the overall morbidity rates for Singapore are as follows:—

Syphilis	72 per 100,000
Proven gonorrhoea	373 per 100,000
Non-gonococcal Urethritis	175 per 100,000
Urethritis in men	877 per 100,000

It will be clear then that if the widespread dissemination of venereal diseases in the community is to be controlled the public and the private sectors would do well to agree on some basic principles, adopt common policies and share information and facilities.

This article offers a basis.

The concept of control requires three thoroughly integrated, harmonising and complementary elements. These are:—

1. Early scientific diagnosis followed by adequate treatment and follow-up.
2. Education of the public about venereal diseases.

\*Based on a lecture given to general practitioners at Pathology Lecture Theatre, General Hospital, Singapore on Tuesday 10th March, 1970.

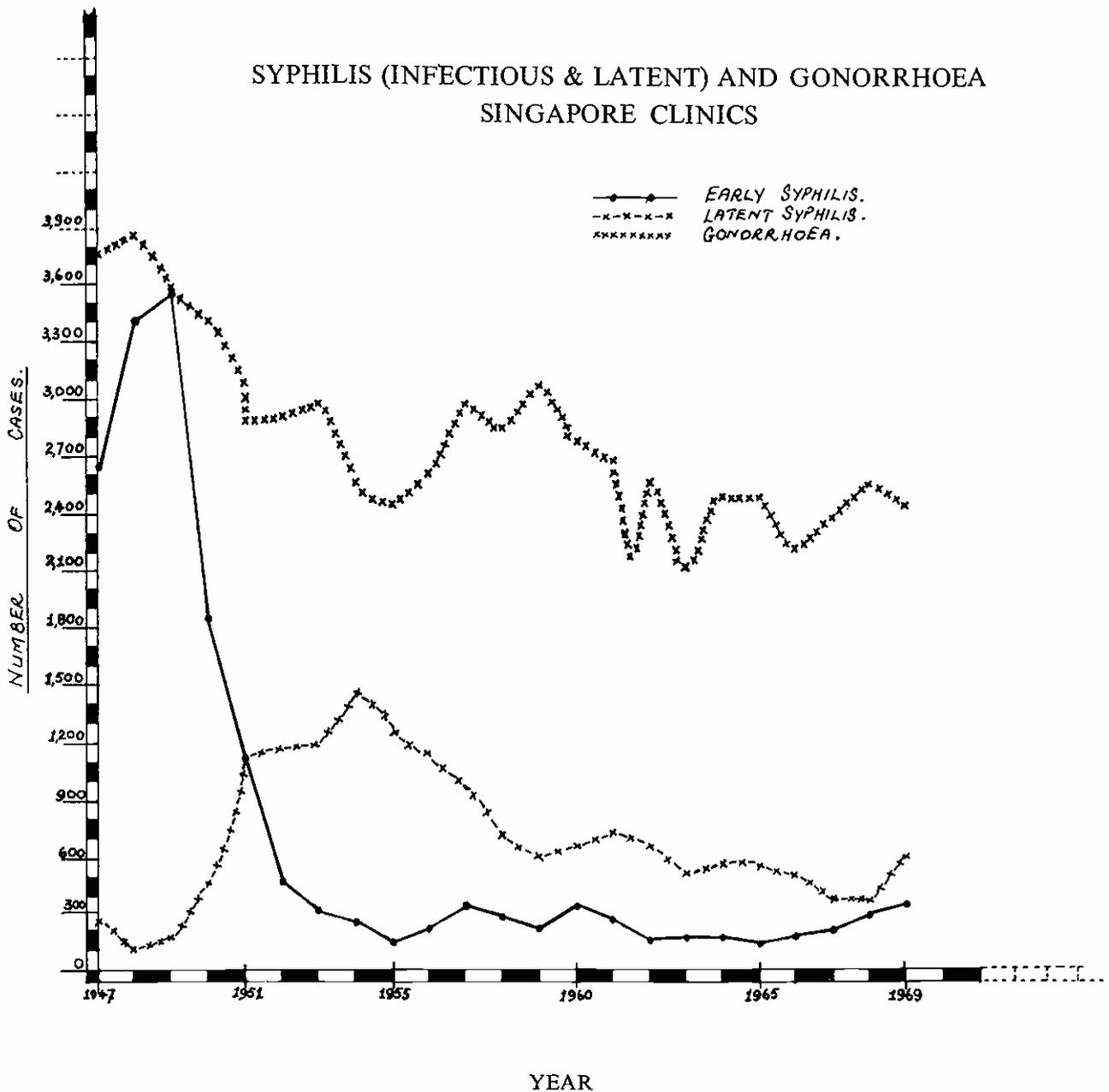


Fig. 1.

3. Adoption and assertive pursuit of case finding techniques.

The practice of any one element only, no matter how thorough, is doomed to failure. Success of a control programme needs all three.

DIAGNOSIS, TREATMENT AND FOLLOW-UP

The prompt and accurate diagnosis of early syphilis is best made by identifying the treponema pallida by dark ground microscopy. In primary syphilis this is essential. The chancre is present 2-3 weeks before blood tests become positive. It is good practice therefore to regard every genital sore as syphilitic until dark ground

examination of serum from the lesion has been undertaken. Likewise unidentified rashes should also be suspected and submitted to the same routine. Blood tests are always positive in the secondary stage of syphilis but these take time whereas microscopy make the diagnosis promptly and minimises chances of spread of infection.

In men with urethral discharge the need for prompt and accurate diagnosis is vital. As a minimum a gram-stained smear of the discharge should always be ordered. The finding of intra- and extra-cellular gram negative diplococci is presumptive diagnosis of gonorrhoea. Confirmation can be obtained by culture methods. The need in men is to distinguish gonorrhoea

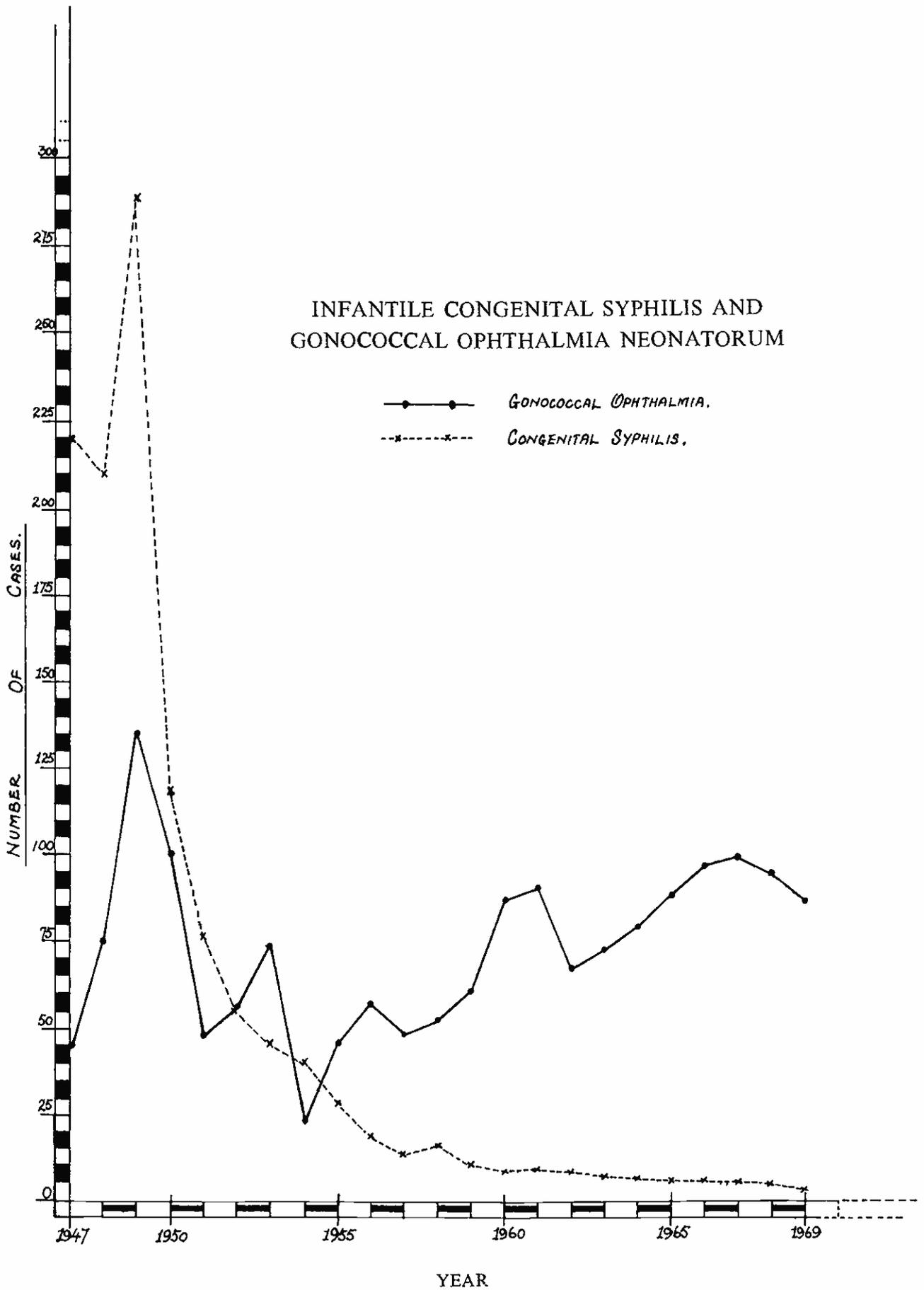


Fig. 2.

TABLE I  
PRIVATE PRACTITIONERS SURVEY

No. sent	-	-	216
Returned 'Gone Away'	-	-	16
Remainder	-	-	200
Returned with data	-	-	124 (62%)
		<b>Jan. 1970</b>	<b>1969</b>
		(120	(114
		replies)	replies)
<b>Females:</b>			
Proven Gonorrhoea	-	55	412
Suspected G.C.	-	147	1,022
Syphilis (Type not specified)	-	5	64
Other Sexually Transmitted Disease	-	154	1,180
<b>Males:</b>			
Proven Gonorrhoea	-	161	1,641
Suspected Gonorrhoea	-	394	3,228
Non-Gonococcal Urethritis	-	182	1,180
Syphilis	-	22	184
Other Sexually Transmitted Disease	-	83	535
<b>Both Sexes:</b>			
Contacts*	-	148	1,911
S.T.S. (Serological rest for syphilis)	-	165	1,363 (13%)

\*This question was badly framed and so widely misunderstood. The figures are believed to be invalid.

TABLE II  
PRIVATE PRACTITIONERS SURVEY—  
THEORETICAL MINIMUM NUMBER OF  
CASES IN 1969

<b>Females:</b>			
Proven Gonorrhoea	-	-	1,030
Suspected Gonorrhoea	-	-	2,555
Syphilis	-	-	160
Other Sexually Transmitted Disease	-	-	2,950
<b>Males:</b>			
Proven Gonorrhoea	-	-	4,102
Suspected Gonorrhoea	-	-	8,070
Non-Gonococcal Urethritis	-	-	2,950
Syphilis	-	-	460
Other Sexually Transmitted Disease	-	-	1,337
<b>Both Sexes:</b>			
Contact*	-	-	-
S.T.S.	-	-	3,405

\*See Table I.

TABLE III  
MASS SURVEYS FOR SYPHILIS—  
SINGAPORE, 1969

	Number Tested	Reactive* Sera	Percentage
Expectant Mothers	25,584	207	0.8
Blood Donors	31,433	440	1.4
Skin Patients	20,379	268	1.3
Seamen	685	46	6.7
Trainee Seamen (15-16 years)	421	Nil	Nil
Prisoners	413	25	6.1
Male Juvenile Delinquents	52	2	3.9
Female Juvenile Delinquents	147	Nil	Nil
New Male Prostitutes	39	10	5.5
New Female Prostitutes	248	44	17.7
	79,401	1,042	1.18

\*The reactive sera figures give the "Crude positivity rate" i.e. not all turned out to have syphilis.

TABLE IV  
MALE : FEMALE RATIOS IN  
GONORRHOEA  
ENGLAND & WALES AND SHEFFIELD

	England & Wales		Sheffield	
	Male	Female	Male	Female
1961	3.89	1	3.31	1
1962	3.98	1	3.70	1
1963	3.44	1	2.34	1
1964	3.38	1	2.14	1
1965	3.16	1	1.69	1
1966	2.92	1	2.22	1
1967	2.74	1	1.66	1
1968	2.65	1	1.72	1
1961	29,519	7,588	348	102
1968	32,476	12,265	325	183
	10%	61%	2%	79%
	Increase	Increase	Decrease	Increase

from the increasingly common forms of non-gonococcal urethritis. Such distinction is a prerequisite of adequate treatment.

The diagnosis of gonorrhoea in the adult female is seldom easy and may require repeated tests. Urethral and endocervical smears can establish a presumptive diagnosis. It is in the adult female however that culture tests are essential. Carbon impregnated swabs can be used and these can be sent through the post in Stuart's Medium for plating out on chocolate-agar. It should not be forgotten that 80% of women with early uncomplicated gonorrhoea have no symptoms and that a growing proportion of women with "cystitis" have in fact gonorrhoea.

Smear and culture specimens from the vagina offer very little hope of finding the gonococcus. They are generally regarded as a waste of time and materials.

In those complaining of the vaginal discharge and/or vulvar irritation a search for the gonococcus, the trichomonas vaginalis and the fungus of thrush should always be made. The Trichomonas can be readily identified in wet preparations by simple trans-illumination microscopy. Gram-stained smears of vaginal material will reveal the fungus of thrush. Both these agents can be preserved in Stuart's Medium and where the history and clinical findings are suggestive, but microscopy fails, culture methods should be employed.

The need for diagnosis before treatment is as sound a principle in the case of the venereally infected as in any other sphere of medicine. In many areas of the world unsound diagnostic methods are the biggest drawback to control of venereal diseases. All too often the exhibition of powerful and expensive antibiotics, frequently in inadequate dosage, has replaced diagnosis. There is little doubt that such practice has contributed to recrudescences of infection in many areas and also promoted antibiotic resistance.

The drug of first choice in infectious syphilis is penicillin. The serum level required to kill *treponema pallida* is not high. The essential is to maintain this level for 10-17 days. This can be achieved by prescribing 600,000 units of aqueous procaine penicillin in one injection daily for 10 days. Some authorities give a second or third course at monthly intervals depending on the duration of the infection.

In patients sensitive to penicillin biological equivalents of other antibiotics can be prescribed e.g. 500 mgm. of a tetracycline six hourly for 10 days.

The principle of gonorrhoea therapy is to find an antibiotic which will give at least a 95% chance of cure. Of the many available antibiotics penicillin is still the supreme choice. It is highly effective, safe and cheap. It has the advantage over all others in that the curative dosage can be given in one injection. Antibiotics dispensed as tablets or capsules have several disadvantages. They are less certain to cure. They may have troublesome and prolonged side effects. They are relatively expensive. Furthermore, forgetfulness and carelessness may lead to failure to follow the prescribed regime. Not least patients may discontinue the course with abatement of symptoms and reserve the remaining tablets for a future occasion or share them with an undeclared consort or wife.

The greatest advantage of penicillin in gonorrhoea lies in the fact that in contrast to other antibiotics it is not associated with complete antibiotic resistance. It is true that there may be partial penicillin resistance or diminished sensitivity in some areas from time to time. To date however no strain of gonococcus has been reported as wholly resistant. This is in marked contrast to the story of other antibiotics.

Over the last 25 years penicillin schedules in gonorrhoea have varied throughout the world. They still do. In general however the one shot dosage has risen and it is now clear that small doses especially of long acting penicillin such as PAM or benethanine penicillin initiate and promote resistance to both penicillin and other antibiotics.

The need in every country and every area is twofold. Firstly, to appraise the effectiveness of present schedules and secondly to make a survey of the penicillin sensitivity range of the local population of gonococci. Both have recently been done in Singapore. A routine schedule of 1.2 mega units of Aqueous Procaine Penicillin gives a failure rate of between 14-25%. The report on the study of 100 strains sent to the World Gonorrhoea Reference Laboratory has just come to hand. It shows that a high percentage of Singapore strains are in the less sensitive range. They are less sensitive to many of the commonly used antibiotics.

One similar study is worth mentioning in detail (Olsen and Lomholt, 1969). For some years in Greenland the routine treatment of gonorrhoea was with a combined penicillin containing 0.6 mega units of crystalline penicillin, 0.6 mega units of aqueous procaine penicillin and 1.2 mega units of benzathine penicillin. Failure rate rose steadily and the proportion of relatively resistance strains rose to 54%. A new regime of therapy was introduced. It consisted of one injection 5 mega units of crystalline benzyl penicillin given in 8 ml. of 0.5% Lidocaine. To maintain a high serum level of the antibiotic 1 gm. of probenecid was given orally half an hour before the injection. Cure rates of nearly 100% were secured and the proportion of relatively resistance strains fell to 19% only.

Such a regime offers safe, prompt and painless cure. It is cheap. Above all it has epidemiological advantages which augment other control measures. It is strongly recommended for consideration and adoption on the widest possible scale.

In infected females two injections, each preceded by probenecid may be more useful. The duration and extent of gonorrhoea in women is often a matter of doubt.

In the penicillin sensitive patient the alternative should be one of the tetracyclines or spiramycin in dosage of 500 mgm. six hourly for 3 days. Where concomitant syphilis is suspected streptomycin or sulphonamides should be used.

The treatment of non-gonococcal urethritis is often difficult. Most authorities are agreed that oxytetracycline 250 mgms., six hourly for 4 or 5 days gives an apparent cure rate of 80-85%. If one tetracycline fails another should be tried. If it in turn fails 1 gm. of streptomycin followed by a 5 day course of sulphonamides should be tried. Other antibiotics may prove useful in the event of failure. It is a truism however that the most effective therapies are associated with the highest relapse rate. The reason is unknown. It is always worthwhile in relapsing cases to examine a wet bead of prostate secretion. It can be obtained by prostate massage. The presence of more than 10 pus cells per high power field or clumping of pus cells is diagnostic of prostatitis and indicates the need for prostatic massage twice per week for three weeks. The antibiotic course found most effective in the individual patient should be repeated during this time.

Other persistently relapsing cases are found to have a urethral stricture.

The consorts of men with persistent and recurrent non-gonococcal urethritis should be examined. The findings of trichomonal vaginitis may well indicate the best line of therapy for the male.

Trichomoniasis in both men and women responds well to Flagyl tablets in 200 mgm. doses t.i.d. for a week. The small percentage of failures all respond to the same dosage for 2 weeks or double the dosage for 1 week. Trichomoniasis is usually a sexually transmitted disease in women. It is always sexually acquired in men. These facts are frequently the clue to recurrences.

In vaginal thrush the best results are obtained by using nystatin pessaries one nightly for a week. Higher dosage is rarely indicated.

Follow-up examinations are no less important than diagnosis and treatment. A minimum of 2 years follow-up after treatment for syphilis is still recommended. It should consist of monthly blood tests for 6 months and three monthly blood tests thereafter. No patient should be discharged until the CSF is checked and found normal.

Men treated for gonorrhoea should be seen on three occasions in the two weeks thereafter. If no urethral discharge is found on examination by the physician and the urine is clear at the end of this period cure can be declared. Where treatment other than penicillin as recommended is given the patient should be examined personally every other day for the first week. In this way the doctor who gives oral antibiotics can go some way to fulfilling the additional obligation he takes upon himself to assure complete cure and make his essential contributions to the epidemiological situation.

In the case of women declaration of cure of gonorrhoea is even more exacting. At least three sets of negative urethral and cervical smears and cultures in the two weeks after therapy are required.

Follow-up tests after treatment of N.G.U. should follow that required for gonorrhoea. In addition the prostatic secretion should always be checked two weeks after "successful" therapy.

Tests after treatment of trichomoniasis and thrush are like-wise advisable.

It is vital to remember that the presence of one sexually transmitted disease is commonly

associated with the existence in the same patient of at least one other infection. The presence of one venereal infection is therefore a clear indication to establish or exclude the presence of others. Of particular importance is syphilis. Irrespective of the form of infection found a serological tests for syphilis should be done initially and again at 6 weeks and 3 months after the last exposure. The same regime should be applied to *all* who have exposed themselves to risk of venereal infection and in whom there is no clinical evidence of disease.

Table I shows the lack of awareness of this aspect. Only 1363 (13%) of the total of 9,446 patients seen privately had a blood test for syphilis. All 9,446 were clearly at risk.

### EDUCATION OF THE PUBLIC ABOUT V.D.

Ignorance about the prevention, the early symptoms and epidemiology of the venereal disease is as widespread in citizens of Singapore as elsewhere.

A start has been made to public education and the possibility of an expanding and well maintained programme in the future is being explored. So also is the whole question of sex and V.D. education in schools. These are matters which call for initiative and application by those in the public sector. Such blanket measures do not however absolve private practitioners from health education. Patients personally involved with a venereal disease very readily learn. Imprinting of facts by the doctor is easiest at this time. Simple explanations with well chosen words ensure patient co-operation in treatment and follow-up. The need to educate patients to a sense of responsibility for their sex partners is an essential facet of the practitioner's role in health education. It is the key to successful tracing and treatment of infected persons.

There is a very special need for practitioners to educate promiscuous males and prostitutes. All prostitutes should be examined weekly by urethral and cervical smear and culture for gonorrhoea and they should have a serological test for syphilis every month. Educating them to the adoption of such simple sanitary measures may be helped by an appeal to their professional pride. Regular prophylaxis with penicillin as above should be considered.

### CASE FINDINGS

Two techniques are available for case finding—mass surveys and the tracing and bringing to treatment the sex contacts of infected persons.

Mass surveys are principally pursued by those in the public sector Table IV. Improvements in the serology service now enable us to deal more scientifically with problem sera.

Private practitioners can obviously help not only by carrying out routine testing of their venereally infected patients and prostitutes but by checking frequently and at every opportunity other "at risk" groups, for example, seafarers in whom venereal disease is known to be 15-20 times commoner than in the general population.

The second area of case finding is contact tracing. Table I shows that the male : female ratio of proven gonorrhoea is the private sector in 1969 was 4 : 1 compared with 3 : 1 in the clinics. It is clear that the sex contacts of men treated privately are not being brought to treatment as ably in the private as in the public sector. As has been found elsewhere, private practitioners less often have the time or the expertise to deal with the epidemiological aspects. The high incidence of gonococcal ophthalmia neonatorum—between 85 and 106 cases annually in the last 6 years—underlines this deficiency.

There are two steps in contact tracing. First is the need to interview the infected patient regarding all his recent sex partners. This concerns all those contacts within the last six weeks in primary cases and the last six months in secondary cases. In gonorrhoea information should be sought regarding partners in the three weeks prior to the onset of symptoms. Contacts should include all possible primary or source contacts and all secondary contacts, particularly wives. It is clear from the incidence of gonococcal ophthalmia that married men need special attention. The older man who declares himself single and has a prompt recurrence of gonorrhoea should raise the practitioner's index of suspicion. It must be remembered and imparted to patients that 25% of women with early syphilis and 80% of women with recently acquired gonorrhoea have no symptoms. Explanations are called for and the need to inculcate a sense of social responsibility in the patient on behalf his sex partners is manifestly an essential to adequate patient care as well as V.D. control. All this is

time-consuming. It also calls for experience and expertise in the techniques of interviewing, persuasion and education. Every such interview which fails to secure the name, address and detailed description of at least one sex contact should be the stepping stone of experience that leads to better understanding and greater proficiency. The private practitioner who is not in a position to undertake this task, who is unwilling or who persistently fails should refer the patient for interview at Middle Road Hospital. There a team of experienced interviewers will undertake this work on his behalf. Where contact information is available it can be passed to Senior Medical Officer, Middle Road Hospital for action. Details of overseas contacts should be notified to Senior Medical Officer who will arrange for their attendance and treatment in their own country.

The second step in contact tracing is visiting the alleged consort or consorts. This work can be undertaken on behalf of private practitioners by the epidemiological section staff at Middle Road Hospital. Speed is essential. Not a few prostitutes change their address frequently. It is for this reason that some members of the epidemiological staff have cars, and use them for prompt visiting and for bringing patients for treatment. These workers have experience, training and the personal qualities of tact, compassion perseverance and assertiveness which is required. Use of their services is recommended.

Contact tracing is not easy. It is however the most potent weapon available for the control of venereal disease. It is vital therefore that private practitioners as well as those working in the public sector should push its potential to the limit.

#### SUMMARY AND CONCLUSION

Not surprisingly Singapore has a V.D. problem.

A high proportion of infected persons is treated privately.

If the dissemination of V.D. in the community is to be reduced, or even controlled at its present level, then public and private sectors will need to work together in an united programme.

For their part, private practitioners require to develop a high index of suspicious and, by improved practice of *all* available measures, become more closely identified with the concept of V.D. control and its day by day practice.

The public sector for its part hopes to offer improved facilities for scientific diagnosis and follow-up. By regular monitoring of the antibiotic sensitivities of the gonococcus it will be able to advise on treatment. It will make available and encourage the use of its epidemiological control service for the interviewing and visiting of the infected and potentially infected.

Whole hearted implementation of these measures by all concerned could reduce the incidence of infectious syphilis in 5-10 years. Together with detection of latent cases Singapore's great financial burden of late syphilis—\$1 million dollars for the syphilitic insane annually—could be cut to a tenth of the sum by the 1980s.

Of the other conditions we cannot be so optimistic. With all the measures mentioned working in concert it has taken 9 years to effect any measure of success in the control of gonorrhoea in Sheffield's half million population. But as Table IV shows it can be done. Indeed it must be if the great burden of distress, misery and sterility which this disease inflicts is to be reduced.

Singapore is distinguishing itself in several areas of medicine. It has potential to give a much needed lead in V.D. control in the East. I sincerely hope it will not miss the opportunity.

Thanks are due to the private practitioner who made time and took the trouble to cooperate in the questionnaire survey.

#### REFERENCE

Olsen, G. A. and Lomholt, G. (1969) *Brit. J. Vener. Dis.* 45, 144.