*A PRELIMINARY ESTIMATE ON THE BURDEN OF VENEREAL DISEASES IN INDIA

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Introduction :

The enormous waste of man power both in industry and agriculture caused by venereal diseases was expressed by the Health Survey and Planning Committee (1961). The ill effects and misery caused by these diseases cannot be measured in terms of money. The burden of the diseases may be expressed in terms of morbidity, disability and mortality among premature infants and among those afflicted by the late complications. The latter particularly involves an age group in the most productive stage of life. The individual's earning potential is curtailed thereby presenting a burden to the family and to society. In a developing country like India this aspect is particularly significant and will cause a vicious circle of poverty and disease. According to Winslow (1951), "Men and women were sick because they were poor : they became poorer because they were sick and sicker because they were poor". Some countries such as the United Kingdom, the United States, the Netherlands and Scandinavia have achieved substantial results by investing some of their surplus capital. In developing countries capital is a scarce commodity, and, therefore, there is little to invest to promote health, and as such venereal diseases often follow their natural course with disastrous results. Sinton (1935-36) calculated that malaria in India involved an economic loss of 80 million rupees per year. Morris reported that in Southern Rhodesia 100,000 man days of production were lost each year through the ravages of venereal diseases. The burden due to venereal diseases can be reduced to a large extent because these diseases are preventable.

In India, at present, all the five venereal diseases, viz., syphilis, gonorrhoea, chancroid, Lympho Granuloma Venereum, and Granuloma Venereum are of public health importance. Of these, syphilis and gonorrhoea are the most widely prevalent. Both venereal and non-venereal types of syphilis have been reported in this country. The former occurs more often in areas with high density of population, such as seaports, urban areas and industrial centers. The non-venereal type is present in some closed-population groups of the sub-Himalayan tracts and border hill states. The infectious potential varies from place to place and time to time, depending upon the shift of population arising from socio-economic changes.

In 1933, Sir John Megaw, then Director-General, Indian Medical Service, investigated the village health conditions and estimated that over 13 million people were suffering from VD.

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From that study, the probability that an individual suffers in his life-time from syphilis was estimated as ranging from 1/10 to 1/7. Taking both syphilis and gonorrhoea, Megaw estimated a proportion of 37 per thousand of the population as showing signs of infection, a figure which was sufficiently high to justify a serious view of the situation. Probably this was the first occasion that serious attention was focussed on the problem of VD in India. The Health Survey and Development Committee (1946) was of the opinion that "their (VD) prevalence could not be considered to be low at least in certain parts", and noted the tendency for their incidence to rise. They re-emphasized the importance of control of these diseases in 1957-61, noting that the positive reactors to syphilis in surveys conducted at Madras and Calcutta among apparently healthy people and expectant mothers varied from 5 to 8 percent. With expected increase in the tempo of industrialization, VD, particularly syphilis, would pose even a more serious problem.

Venereal diseases are not notifiable in India. From 1940 onwards, incomplete and patchy information about early infectious syphilis and gonorrhoea cases was available till 1948. Attempts to collect information about cases diagnosed as syphilis, gonorrhoea, chancroid and other VD diagnosed in special clinics and hospitals were made only after the independence of India. The Director-General of Health Services publishes figures every year. Admittedly, these data are incomplete, and hence cannot serve as a basis for comparison of the prevalence from year to year. Also, the data on the cases treated by qualified and un-qualified medical practitioners, are unobtainable. Furthermore, the diagnosis of VD in many cases was not based on laboratory tests, thereby leading to some misclassification and consequent inaccuracies in the statistics.

In spite of these difficulties, some attempts were made to estimate the incidence and prevalence of syphilis by various authors. Rajam (1948) estimated a 5 percent prevalence rate for syphilis alone, which might have been a conservative estimate. The reactivity rate among the antenatal cases is a useful indicator for gauging the incidence of syphilis in the population in general. In a sample of 2,000 antenatal cases, Ghosh (1945) reported a sero-positivity rate of 5 percent. The Institute of Venereology Madras, estimated an average of 3 percent incidence of syphilis for the years 1948–58. An incidence rate of 7 percent was reported by Leiby (1949) for women of the maternity clinics in Delhi during 1949. In 1957, a sero-reactivity rate of 12 percent was observed from specimens of the antenatal clinics of the Municipal Corporation of Delhi. Tampi (1962) estimated an incidence of 3–4 percent in urban and semi-urban areas of India by considering the hospital and clinic rates for early infectious syphilis.

The correct rates of incidence and prevalence for a disease are necessary to estimate the burden of the disease. The morbidity data of venereal diseases with respect to sex, occupation and income will not only increase the precision of the estimate but also will be useful to calculate the cost of these diseases in specific groups.

In India, a national control program for combating these diseases is not yet available, and one can only guess what benefits would be reaped from such a program. A national control program would require an annual appropriation of considerable size. The justification for the appropriation would be the relief of the population from the ravages of these diseases, and this would probably result in substantial economic benefits. Winslow 1951) stated "Prevention is not only better than cure; it is cheaper than cure". He further stated "Nations like Sweden and the United States which have been able to make the relatively small investment involved in

a sound public health program have reaped a rich harvest in life capital as a result".

Material and Methods:

In view of the difficulties for estimating the burden due to venereal diseases, a new method of approach has been followed in this paper. It has been mentioned before that the incidence of syphilis was estimated by various authors to be around 3 percent. Based upon this figure and the 1961 census population of 438 million, approximately 13 million people may be considered suffering from syphilis. Nearly 3 lakhs* are reported to seek treatment per annum in VD Clinics and other hospitals. Even considering that all the 3 lakhs syphilitics complete the necessary treatment, which is rather a skeptical inference, it may be assumed another 7 lakhs might have had treatment from private physicians. The remaining 12 million syphilitics do not seek treatment in that specific year. The outcome of the 12 million untreated syphilitics was estimated by applying the results of the studies on prognosis of untreated syphilis conducted by Bruusgaard (1929) and Gjestland (1955). Although the socio-economic conditions in Norway may differ significantly to those of India, it is assumed that the prognosis of untreated syphilis observed in Oslo study, if applied to India, would give us some hints about the problem which has not been studied before in India The burden of the diseases will be primarily on the individual who forms part of the nation. The cost of providing medical facilities is termed as direct cost. The indirect cost would be the loss resulting from the individual's inability to contribute to the national income by incapacitation or loss of skill. The direct and indirect burden are calculated for the various stages of syphilis, gonorrhoea, chancroid and other venereal diseases and the total has been estimated. Sufficient care was taken to ensure that the estimates are minimal in all cases and in fact the burden might have been much more. These estimates are shown in Table 2. In any case, the high cost of these diseases warrants the urgency in taking adequate measures to control these diseases to avoid the wastage of scarce capital and human resources. The cost-benefit analysis has not been attempted in this paper due to the non-availability of necessary data for the entire country because these diseases are not reportable.

* 1 Lakh — 100,000

RESULTS AND DISCUSSION

Untreated Syphilis in India

Syphilis is a highly complex disease capable of involving practically every structure of the body during its course. In the later part of the 19th and early part of the 20th centuries, Boeck of Oslo admitted a large number of syphilitic patients and did not treat them as the treatment available at that time was worse than the disease. Bruusgaard (1929) and Gjestland (1955) conducted special studies on Boeck's material about the prognosis of untreated syphilis. The summaries of Bruusgaard's and Gjestland's data as to the ultimate outcome of untreated syphilis are as follows :

TABLE I

Outcome	Bruusgaard's Study (1929) percent	Gjestland's Study (1955) percent
Neuro-syphilis	9.5	6.5
Cardio-vascular syphilis	12.8	10.4
Benign late syphilis	12.2	15.8
Latent Syphilis	14.1	—
Spontaneous Cure	27.9	—
Died of syphilis other than CVS, CNS	0.8	10.8
Died of some other cause (Tuberculosis, Cancer, etc.)	22.6	10.0

Applying this analogy to the 1961 census population of India, the outcome of 12 million untreated syphilitics per year works out as follows:

TABLE 2

Outcome	Estimated number of patients according to: Bruusgaard's study of prognosis	Gjestland's study of prognosis
Neuro-syphilis	11.4 Lakhs	7.8 Lakhs
Cardio-vascular syphilis	15.4 ,,	12.5 ,,
Benign late syphilis	14.6 ,,	19.0 ,,
Latent syphilis	16.9 ,,	—
Spontaneous Cure	33.5 ,,	—
Mortality due to other syphilis (Other than CVS, CNS)	1.0 ,,	13.0 ,,
Mortality of other causes e.g., Cancer, Tuberculosis	27.1 ,,	12.0 ,,

Sometimes syphilis may be acquired without showing any demonstrable signs and symptoms. According to Thomas (1953) early stages of syphilis would pass unnoticed in 15–30 percent of infected individuals, which means that 70 percent or 7 million syphilitics might have the signs and symptoms of early syphilis. Even if they do not seek any treatment, temporary absence from employment for a few days and the associated mental agony as a result of the early lesions must be considerable. If 7 million people are absent for one day each, the loss due to absenteeism and the consequent loss in production comes approximately to 7 million rupees per year taking into consideration only per capita income at 1 rupee per day. To the above, if we include the one million syphilitics who report to clinics and private physicians per year, the loss amounts to 8 million per year for a single day of absence. The direct costs of treating 3 lakhs reported cases to government hospitals during one year are as follows:

1. Drugs, @ Rs. 4/- per person Rs. 12 lakhs
2. Expenditure for laboratory tests @ Rs. 4/- per person Rs. 12 lakhs
3. Expenditure for providing consultative services @ Rs. 0–50 per patient Rs. 1.5 lakhs

Total Rs. 25.5 lakhs

The cost of routine equipment necessary for the clinic and laboratory is not included. The estimates for the expenditure for laboratory tests and consultative services are minimal and based upon the maximum efficient output possible and the existing scales of pay for scientific personnel employed in the VD Training Center.

Every syphilitic patient usually attends the clinic for 9 days, during which period these people generally will not be able to concentrate on their occupations. Further, the absenteeism results in reduced national income. Taking per capita income as Rs. 1/- per day, the loss of income for the 3 lakhs syphilitics would have been equal to number of days x number of syphilitics x daily income, and this would be 9 x 3 x 1 = Rs. 27 lakhs. The direct and indirect loss due to 3 lakhs syphilitics treated thus amounts to Rs. 25.5 lakhs plus Rs. 27 lakhs totalling to

Rs. 52.5 lakhs. While calculating the indirect burden, only per capita income was considered; actually the product of their labour is approximately double of what they are paid for.

The number of syphilitics resorting to private treatment, to treatment from unqualified people, to self-treatment, etc., would probably be at least double the number of patients reporting to the VD clinics becausc of the social stigma attached to syphilis. The above loss may therefore have to be multiplied by three to include the total loss due to the treated cases. This works out to be Rs. 150/- lakhs or Rs. 15 million per year.

Neuro-Syphilis

Out of the 12 million syphilitics who do not seek any treatment at all, it is estimated that 11.4 lakhs or 7.8 lakhs may develop Neurosyphilis based on the prognosis of untreated syphilis by Bruusgaard (1929) and Gjestland (1955) respectively. The latter study was more recent (1955) and, therefore, more acceptable than that of Bruusgaard (1929). If we take the minimum figure of Gjestland, it can be seen that 6.5% of the patients may develop symptoms of Neurosyphilis. The British Co-operative Clinical Group (1956) estimated that 13.5% of all Neurosyphilitics will be asymptomatic, i.e , the only evidence of the infection is a positive cerebrospinal fluid. Thus, in one lakh patients Neurosyphilis may be asymptomatic, and they would be subjected to diagnostic tests such as Lumbar Puncture which are likely to render the patient absent from work for about three days on the average. In terms of cost, the above may be reckoned as a loss of Rs. 3 lakhs for asymptomatic Neurosyphilis patients.

The remaining 6.8 lakhs who are symptomatic may develop one or more of the several manifestations of Neurosyphilis with disastrous results and poor prognosis: (1) meningitis, (2) predominantly vascular involvement, (3) meningo vascular, (4) genereal paresis, (5) tabes dorsalis, (6) taboparesis, (7) erbs spinal spastic paraplegia, (8) Syphilitic epilepsy, (9) gumma of brain and spinal cord, (10) eighth nerve deafness, (11) primary optic atrophy, (12) others, such as meningo myelitis, hyper-tropic patchymeningitis, and syphilitic neuritis, etc. In the analysis of 92 Neurosyphilis cases from VD Training Center, Safdarjang Hospital, New Delhi, it was found that meningitis, vascular and meningovascular syphilis constituted 46.8%. Tabes, optic atrophy, and genereal paresis of insane were found in 15.0%, 18.0% and 4.4%, respectively.

The analysis of probable cause of insanity in the patients admitted in the mental hospitals in India during 1948-58 revealed that nearly 2% had syphilis. (Statistical abstract, 1950, Ministry of Health). The mental institutions at that time were few, and the facilities were meagre; hospitalization was unlikely. Considering the low figure of 2% and not 4.4% as syphilitic genereal paresis of insane, 13,600 people may be expected to be incapacitated annually in India. In the United States, it was estimated that such patients are cared for by mental institutions for an average of 11 years. The expectation of life at birth for USA and India are 62 and 42 years, respectively (Census 1961). By taking only 5 years as the period of incapacitation, the total man-years lost due to paresis alone is 13,600 x 5 or 68,000 man-years. The cost of maintaining a paretic patient in the U.S.A. is $ 1,610 or Rs. 12,000 a year, which is nearly three times the per capita income.

Using per capita income for estimating the minimum loss due to syphilitic paresis alone, the minimum loss in India is Rs. 22.4 million. Actually, the average income of the working class population should be taken to compute the loss due to syphilitic paresis. But

to be more conservative in approach for pointing out the tremendous loss due to these diseases only per capita income, though it is roughly half of the average income of working class population, has been taken. To be more precise Rs. 44.8 million rupees would represent the loss in India due to syphilitic paresis alone.

Using very low parameters to estimate the loss due to neurosyphilis, the loss is at least 6.8 lakhs man-years annually. The money value of these persons would be Rs. 22.4 million per annum.

The total loss for 5 years during which the patients would be a burden to the family before succumbing, would be 5 x 22.4 or Rs. 112 million. Similar are the disastrous effects of neuro-syphilis in tabes and optic atrophy.

Cardio-vascular Syphilis

Another important late manifestation of syphilis is involvement of the cardio vascular system with its "ubiquitous", "insidious" and "disastrous" course (Stokes. 1944). Bruusgaard (1929) and Gjestland (1955) found that 12.8% and 10.4%, respectively, of the untreated syphilitics had cardio-vascular syphilis. But taking Gjestland's estimate of 10.4% which is lower than that of Bruusgaard, nearly 12.5 lakhs of untreated syphilitics probably develop some of the following forms of cardio-vascular syphilis: Simple aortitis, aortic aneurysm, and aortic incompetence.

Like neurosyphilis, cardio-vascular syphilis lesions are also destructive and responsible for not only incapacitation but also a heavy burden to the family members and hospitals. In the absence of tests such as STS, ECG., etc. many cases escape the correct diagnosis of CVS. By taking 5 years as the minimum period of incapacitation, as in the case of neurosyphilis, the total man-years lost due to cardio-vascular syphilis works out to 12.5 x 5 = 62.5 lakhs man-years. The burden of the same will be equal to 12.5 lakhs x 330 = Rs. 41 million per year or 5 x 41 = Rs. 205 million for 5 years of disability.

Late Benign Syphilis

Late benign syphilis is less disastrous than neuro and cardio-vascular syphilis. According to the prognosis of the untreated syphilis found by Bruusgaard and Gjestland, late benign syphilis occurs in 12.1% and 15.8% of untreated syphilitics. If we accept the lower figure of Bruusgaard (1929), nearly 14.6 lakhs of untreated syphilitics may have late benign syphilis. The man-years lost due to incapacitations for one year works out to 14.6 lakhs, which points out the enormous loss of man power due to late benign syphilis which is preventable. If adequate attempts to control are made, rich dividends which would contribute significantly at the developing stage of the country could be expected.

Congenital Syphilis

Syphilis if not treated adequately may be passed on to the offspring producing congenital syphilis. This condition accounts for a considerable loss of life in the neonatal period, premature birth, crippling and several handicaps to the affected child. Deafness, blindness, physical deformities in the babies and retardation of both physical and mental development result in expensive and prolonged treatment and rehabilitation procedures.

During the period 1949–56, the reported cases of congenital syphilis varied from 20,467 to 76,724. As in the case of other types of syphilis, the reported figures might be very low. Many cases might escape the correct diagnosis due to inadequate facilities and low index of suspicion. In some years there were 70 thousand cases reported to government hospitals. Even considering that 40,489 children (reported

during 1956) suffers annually from congenital syphilis, the loss of human resources is considerable. Congenital syphilitic children usually may develop early lesions within two years of birth and late (Tardive) manifestations similar to acquired syphilis, two years after birth. The early signs and symptoms of congenital syphilis constitute a variety of manifestations such as rhinitis, skin and mucus membrane lesions, under development, nutrition disturbances, "little old man" appearance, paraplegia or other neural involvement. The signs and symptoms of late congenital syphilis include disc-shaped face, saddle-shaped nose, bossing of skull, corneal opacities, nerve deafness, gummatous destructive lesions, enlargement of liver and spleen, mental backwardness, retarded growth, etc.

It can be seen from the above that the life of nearly 40,000 congenital syphilitics would be seriously handicapped even if they are alive. They are of constant worry to parents taking their valuable time and hard earned money for taking the afflicted children to different places and people for medical aid with the fond hope that the destructive lesions might be reversed or improved. The children by themselves find it difficult to lead a normal childhood, and in their later life will be unable to engage in the normal activities of life to contribute for the good of themselves and to the country's wealth.

The direct cost of the 40,000 congenital syphilis cases is as follows:

	Lakhs
1. Expenditure for treatment of 40,000 congenital syphilis (drugs at Rs. 4/- per patient)	Rs. 1.6
2. Expenditure for laboratory tests (at the rate of Rs. 4/- per patient)	Rs. 1.6
3. Expenditure for providing construction service (at the rate of Rs. 0.50/- per patient)	Rs. 0.2
Total	Rs. 3.4

Every congenital syphilitic child is to be taken for medical advice by his or her parent or guardian who will be absent from his work for at least 9 days, consequently affecting national income. The direct and indirect loss due to cases reported to hospitals may be Rs. 3.4 lakhs + Rs. 3.6 lakhs = Rs. 7 lakhs.

Considering that nearly double the number of cases might be resorting to treatment by private practitioners, etc., as in the cases of acquired syphilis, the total loss due to congenital syphilis in India would be Rs. 21 lakhs per year. We have not included the social stigma of the diseases suffered by all the congenital syphilitic children, which is a factor too valuable to be reckoned in terms of money.

Untreated Syphilitics having a Higher and Premature Mortality

It is an accepted fact that syphilitics either untreated or inadequately treated will have a higher mortality than the normal population. Moore and Schamberg (1947) found that syphilis imposes an extra mortality hazard ranging from 138 to 188 % of expected mortality reckoned at 100%. The "Alabama" (U.S.A.) study indicated that not only did the syphilitics show an excess mortality of about 70% over the controls, but also that the former showed evidence of an increased morbidity from diseases other than syphilis. The mortality due to syphilis excluding cardiovascular and neuro-syphilis were found by Bruusgaard (1929) and Gjestland (1955) to be 0.8 % and 10.8 % of the untreated syphilitics. The findings of the former is lower, and even at that low estimate, one lakh persons per annum may meet with premature death in India. The preamble to the constitution of the World Health Organization states that the enjoyment of the highest attainable standards of health is one of the fundamental rights of every human being. The premature death in these

one lakh persons results in enormous wastage of man-power and nation's wealth. The annual loss due to the premature death would be Rs. 330 × 1 lakh or Rs. 165 million.

Syphilis is more prevalent in the lower socio-economic strata and this group is subjected to increased mortality risk from various factors such as acute infections, tuberculosis, cancer, industrial hazards, etc. Bruusgaard and Gjestland, respectively, found that 22.6 % and 10 % of the untreated syphilitics died of some other cause, viz., tuberculosis, cancer, etc. By taking the minimum figure of Gjestland nearly 12 lakhs of untreated syphilitics may have a premature death due to diseases other than syphilis. The loss due to the premature death of these 12 lakhs persons would be Rs. 330 × 12 lakhs or Rs. 39.6 million per annum. This estimate is made by considering that untreated or inadequately treated syphilitics might have a higher mortality occurring earlier at least by one year.

Gonorrhoea

Among the communicable diseases, gonorrhoea takes the second place in importance and its prevalence next to syphilis. The characteristic symptom of the disease in males is the purulent discharge from the uretha in about 2 to 7 days from the day of sexual exposure. If treatment is not taken, the discharge continues for some time and then diminishes gradually. Then the causative organism gonococci invade, firstly, the genito-urinary system and later, may affect other parts of the body.

In females, the disease is diagnosed with considerable difficulty due to the anatomical structure of the female genitalia, and the symptoms might not even be felt or noticed by the persons inspite of harboring the organism. The disease, if neglected, may cause crippling arthritis, sterility and chronic ill-health. Infants born of mothers having gonococcal infection may be infected in their eyes producing G.C. Opthalmia neonatarum, which is a very important cause of preventable blindness in children. The signs and symptoms may include conjunctivitis, corneal ulceration, corneal opacity ending in blindness.

In 1940 and 1956, there were nearly 350,000 gonorrhoea cases. During the intervening period, the number of cases fluctuated without any pattern and were seen to vary between 30,530 and 300,000.

It may also be mentioned here that the above figures are not only incomplete but also grossly underreported. It can be seen that every year nearly 2 to 3 lakhs persons were reported, but in some years low figures of 30 thousand and eighty thousand have been reported. Compared to 1940, the medical facilities now have been improved and the number of cases of gonorrhoea have also increased.

The direct cost of 3.5 lakhs patients of gonorrhoea is as follows :

	Lakhs Rs.
1. Expenditure for treatment of 3.5 lakhs of gonorrhoea patients, (Drugs) @ Rs. 1/- per patient.	3.5
2. Expenditure for lab. tests at Rs. 1/- per patient.	3.5
3. Expenditure for providing consultative services @ Rs. 0.50 per patient.	1.8
Total	8.8

It was found by a sample study in the V. D. Training Center, Safdarjang Hospital, New Delhi, that every patient of gonorrhoea attends the clinic for 5 days during which period the patients may be absent from their work, either partially or completely, thereby affecting the production in various occupations. The indirect loss in production

due to absenteeism of 3.5 lakhs gonorrhoea patients by considering the average daily income as Rs. 2/- will be 350,000 x 2 x 5 or Rs. 35 lakhs.

Leiby (1950) stated that the experience in the general population is that normally 3 to 6 cases of Gonorrhoea are seen for each case of syphilis. In India nearly 3 lakhs syphilis cases are reported every year, and assuming that there might be 2 cases of Gonorrhoea for every case of syphilis, there should be nearly 9 lakhs of gonorrhoea cases occurring every year. The indirect loss due to 6 lakhs gonorrhoea patients will be 3.0 million man-days or Rs. 6 million per year.

The incidence of syphilis has been estimated as 3 per cent and based upon this, the incidence of gonorrhoea might well be 6 per cent which includes the cases reported and not reported but possibly occurring every year. If we consider that the daily average loss in production per person is Rs. 2/- and the period of absence is 2 days, the loss would be 260,000 $\times$ 2, or 52 million man-days, or Rs. 104 million per year.

Chancroid

Chancroid (also known as soft sore, soft chancre) is an acute localized disease. It is caused by the organism known as "Hemophilus Ducreyi" and is characterized by single or multiple ulcerations which are painful and followed by inflamatory swelling of the lymph nodes. It is transmitted by sexual exposure and occurs most frequently among those who do not observe proper sexual hygiene. The lesions occur on the prepuce or shaft of the penis in males, and in females on the labia or clitoris.

In 1949, nearly 87 thousand cases of Chancroid were seen in India, whereas in the next year, less than half or 37 thousand cases only have been reported. During 1955 there were 7,620 cases reported, but in the next year the number of cases reported was 29,600. It can be observed that the annual reported cases do not conform to any trend, and only show that the figures reported are unreliable. The direct cost of 29,000 chancroid cases will be as follows :

	Rs.
1. Cost of treating the 29,000 Chancroid cases (Drugs) Rs. 1/- per patient	29,000
2. Cost of providing consultative services Rs. 0·50 per patient	14,500
3. Cost of providing lab. tests (STS) to exclude syphilis Rs. 4 per patient	116,000
Total	259,500

It was found by a sample study that a chancroid patient usually attends the V.D.T.C., S.J.H. New Delhi for 6 times, and the man-days lost would be 29,000 $\times$ 6 or 174,000 per year. The loss in production as a result of this disease would be nearly Rs. 348,000 per annum.

Socrates de Noronha (1962) quoted Leiby that the relative incidence of syphilis, gonorrhoea and chancroid to be 1 : 5 : 4 in the cities visited by him. Based on the above findings, for every case of syphilis, there should be normally 4 to 5 cases of chancroid occurring in the population. Assuming that there might be 3 cases of chancroid occurring for every case of syphilis, and if 3 lakhs syphilis cases are reported in India per annum, there should be nearly 9 lakhs of people suffering from chancroid in India annually. As stated before, the disease is an acute one with less complications, and as such will not incapacitate the affected individuals except for 2 or 3 days of absenteeism. The man-days lost due to chancroid would be nearly 18 lakhs

due to absenteeism for 2 days with consequent loss in production by about Rs. 36 lakhs per year.

The incidence of chancroid might be 9% of population based upon the incidence of syphilis which is 3%. This estimate involves roughly 39 million patients of chancroid, and it might be that 78 million man days are lost every year due to this disease in India. The above patients might suffer at least for 2 days, but the real quantum of the disease is not known This was due to incomplete reporting, as well as the acute nature and easy treatment of the disease with sulpha drugs which most of the people often resort to for a host of other ailments.

Other venereal diseases

The remaining minor venereal diseases that are prevalent in the country are lympho granuloma venereum, granuloma inguinale, non-gonococcal urethritis and trichomoniasis. Diseases like Balano-posthitis and Herpes progenitalis are also commonly seen in VD clinics In 1949, about 28,000 cases were seen in clinics compared to nearly 200,000 cases during subsequent years. The number for 1956 was seen to be 125,142.

Considering that 1.3 lakhs of patients attend the hospitals and clinics annually for other venereal diseases, all the patients would have also been given a routine blood S.T.S. for exclusion of syphilis. The direct cost of providing service to such patients would be as follows :

	Lakhs
1. Expenditure for providing consultative service @ Rs. 0.50 per person	Rs. 3.5
2. Expenditure for lab. test @ Rs. 4/- per person	Rs. 5.2
3. Expenditure for treatment @ Rs. 1/- per person	Rs. 1.3
Total :	Rs. 10.0

From a sample study conducted at the V.D.T.C., S.J.H. New Delhi, it was found that a patient suffering from other VD attends the clinic 5 times, and the man days lost due to the diseases would be 5 x 1.3, or 6.5 lakhs per year, and the annual loss in production would be Rs. 13 lakhs.

Leiby (1950) estimated that there are 16 million syphilitics in India, but based upon 3 per cent incidence of syphilis, there may be 13 million syphilitics in India which is also in conformity with the reported figures multiplied by 20. Rajam (1948) reported that for every case reported, 20 cases go unreported. Leiby (1950) also estimated that in India 100 million people actually suffer from venereal diseases. The estimate in the present paper comes to 78 million as follows :

	million
Syphilis	13
Gonorrhoea (Twice of syphilis)	26
Chancroid (Thrice of syphilis)	39
Other V.D.	8
Total	78

From the above estimates the liability of venereal diseases in India appear to be nearly Rs. 50 crores per annum and comprise the distribution for disease categories is as follows :

Syphilis = Rs. 17 crores
Gonorrhoea = Rs. 15 crores
Chancroid = Rs. 15 crores
Other VD = Rs. 3 crores

Venereal diseases control programs started earnestly will enrich the human life and bring to the country enormous economic benefits. As Winslow (1951) pointed out "Prevention is not only better than cure; it is also cheaper than cure". Long term venereal diseases control programs in Denmark, Norway

and Sweden during present century, demonstrated clearly the achievements possible by the modern methods of control. The rate of new cases of syphilis per 100,000 was brought down from 147 cases in 1919 to 20 cases in 1949. Winslow (1951) stated further "the possibilities offered by an organized program based on penicillin treatment with adequate continued Health supervision are enormous". In a demonstration carried out against endemic syphilis in a village in Yugoslavia, every single case of infection was discovered and treated, and after a 10-month period 65% of the patients were sero-negative, and not a single new case had occurred.

The economic benefits achieved by carrying a disease control program are demonstrated in Haiti by the W.H.O. in collaboration with UNICEF, in a project of yaws control programs in widely prevalent rural populations and treated monthly 35,000 to 55,000 persons. Winslow (1951) also stated that by the simple program 100,000 incapacitated persons have been returned to work, increasing the national production of Haiti by $5,000,000 a year.

Summary

In this paper an attempt is made to estimate the burden of venereal diseases in India. Since these diseases are not notifiable in India, and also the data currently available are inadequate for cost-benefit analysis, the estimates computed are preliminary and, therefore, to be considered minimal.

The estimation procedures involved the application of results from studies on the prognosis of untreated syphilis in Norway and the United States of America, review of literature on the incidence of syphilis in India and the computation of direct and indirect burden due to neurosyphilis, congenital syphilis, gonorrhoea, chancroid and other VD. The liability due to syphilis and gonorrhoea, is estimated to be Rs. 17 crores and Rs. 15 crores, respectively. The persons involved for these diseases were 13 million and 26 million, respectively. The burden due to neurosyphilis was Rs. 22.4 million as against Rs 41 million for cardio-vascular syphilis.

This paper points out the need and urgency to develop intensive national programs for the control of these diseases which are preventable. The economic benefits that may be achieved in a developing country like India as a result of such programs are enormous besides reducing the human misery.

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REFERENCES

1. Annual Reports of the VD Training Center; Safdarjang Hospital, New Delhi, 1955-63.
2. Annual Reports of the Director-General of Health Services, Ministry of Health, Government of India, New Delhi (1950-56)
3. British Co-operative Clinical Group of Gonorrhoea Study: Report Brit Jr. of VD, 32:21 1956.
4. Bruusgaard (1929): Quoted by 6.
5. Ghosh (1945): Quoted by 9.
6. Gjestland, Trygve (1955): Oslo Study of Untreated Syphilis. Acta Dermato-Venereologica: 35, Supplementum: 34, (1955)
7. Health Survey and Development Committee Ministry of Health, Government of India (1946)
8. Health Survey and Planning Committee: Ministry of Health, Government of India (1961)
9. Leiby, M. (1950): Proposal for the Control of VD in India. W.H.O. No.: Int/VD/28 dated 13th June 1950 (Unpublished)

10. Morris: Quoted by 17.

11. Noronha, Socrates (1956): Quoted by C.R. Dacosta, The 5th All India Conference on Moral and Social Hygiene.

12. Rajam, R.V. Medical and Public Health Aspects of VD in India. Jr. Ind. Med. Assn., 17, 10, 1948.

13. Roshan, P.D.: Autopsy Studies in Syphilis. Venereal Diseases Information Supp. 21, Govt. Pring Office, Washington 1947.

14 Stokes, J.H., et al: Modern Syphilogy. W.B. Saunders, Philadelphia, 1944.

15. Tampi, R.B.: Venereal Diseases in India. Central Health Education Bureau; Series No. 5, Govt. of India 1962.

16. Thomas, EW.: Syphilis; Its Course and Management. The MacMillan Company, New York, 1953.

17. Winslow, C.E.A.: The Cost of Sickness and Price of Health, W.H.O. Monograph No. 7, 1951.

TRUE or FALSE?

The delayed blanching reaction to intracutaneous injection of Mecholyl in atopic individual is due to vasoconsriction.

(Answer page No. 175)