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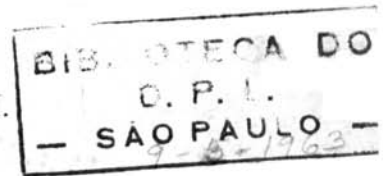
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EVALUATION OF THE LEPROSY CONTROL PROGRAM OF THE PHILIPPINES

I. METHODS

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- II. Results of estimates of the prevalence of leprosy during the presulfone period in the Philippines.
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Since the introduction of sulfone therapy, particularly the use of DDS, valuable contributions have appeared in the literature describing leprosy control programs of different countries, most of them essentially based on the use of these drugs in "mass treatment." These articles are inclined to be on the optimistic side, although no evidence is presented to confirm the hoped-for favorable effects of such control measures on the prevalence of the disease. Perhaps the period of time that has elapsed since the control programs were started is still too short to permit determination of the course of the disease. Be that as it may, success should not be taken for granted until there has been obtained evidence concerning the decline of the disease sufficient for statistical analysis and verification.

I. METHODS OF DETERMINING THE TREND OF LEPROSY

One of the best means of securing an appraisal as to whether or not a control program is progressing favorably is to determine the trend of the disease. However, it is difficult to gather the necessary base-line data for such an appraisal, particularly in the case of leprosy which has such a chronic and variable course, as well as a prolonged

¹Retired as of December 1, 1961.

and ill-defined incubation period. It is useful, therefore, to study methods already employed by other workers in determining this trend.

In 1947, Doull *et al.* (³) published an article on historical inquiry as a method of estimating the trend of leprosy, which merits study by those interested in this problem. The data for this report as well as for other intensive field studies were collected in the municipalities of Cordova and Talisay, in Cebu, Philippines. A detailed history was obtained for every household, some of which were established in the last few years of the preceding century, from the date of their establishment onward. At the same time, intensive inquiries were made as to the occurrence of leprosy in every individual in these two towns. Records of 3,024 families were available, including 21,791 individuals, varying in age from more than 80 years to newly-born infants.

During the period covered, 402 cases of leprosy had occurred in these families. The data thus obtained permitted the use of a modified life-table method of analysis. The reader is referred to the original article and others previously published on this valuable survey, in order to obtain the details of setting up a modified life-table method which permits the derivation of accurate incidence rates for the entire population, and of specific attack rates for special groups exposed in the household to the disease.

At the same time, all of the living persons with leprosy were questioned, their records in the leprosaria or skin clinics were analyzed, and details about the history of the disease were checked with information obtained directly from members of the household and other observing persons in the neighborhood. Biopsy specimens from early, bacteriologically negative cases were secured and sent to Dr. H. W. Wade, at Culion, for examination to confirm the diagnosis.

In making the analysis, the authors arbitrarily divided the period of observation into years before and years after January 1, 1915. Care was taken to select two groups of individuals in such a manner that the life experience of the groups were mutually exclusive and limited to the same number of years. It was found that, when the two periods were compared, there was evidence of a downward trend so far as concerned the incidence of the lepromatous type. The ratio of the incidence rate for the earlier period to that for the latter was for males 2.0 to 1, and for females 2.4 to 1.

The authors noted that compulsory segregation was introduced in the Philippines in 1907, and that any influence on incidence which this administrative procedure might have had would be expected to be evident, at least by 1915. The downward trend observed was thus in accord with the view that segregation may have been a factor. They concluded, however, that the experience was relatively small and should be confirmed by more extensive studies. In addition, there were other environmental changes which took place during the periods studied,

among which was a general improvement in the economic status of the population together with other changes following that advance.

The downward trend of the lepromatous type thus revealed by the historical or retrospective method was subsequently confirmed by a more accurate study based on actual observations and reported in 1954 by practically the same group, Guinto *et al.* (⁴). The study compared the prevalence and incidence rates in the population of both towns, and the attack rates in household associates actually observed during the period between initial and final surveys of each town.

For Cordova, three complete surveys had been made. The first was in 1933 and the second in 1941, separated by a period of a little less than 8 years; the third was made in 1948, so that the total time interval between the first and last examinations was 15 years. In Talisay, only two surveys were made; the preliminary one was done in 1936-1937, and the resurvey was made in 1950-51, with a period interval of 14 years elapsing between the two surveys. The combined population of the two towns was 16,735 at the initial survey and totaled 20,920 at the final surveys, representing a net increase of 4,185.

The combined prevalence for the lepromatous type in the two towns at the preliminary survey averaged 11.6 per thousand of the enumerated population, while the average prevalence rate found in the final surveys was 5.4 per thousand. On the other hand, the corresponding prevalence rate for the nonlepromatous types was 7.7 in the initial surveys and 13.1 in the final surveys. There was therefore a marked downward trend of the lepromatous type, accompanied, however, by almost as marked increase in the prevalence rates for the nonlepromatous forms of the disease. This latter rise will be viewed with concern by some leprologists who believe that a rise in the prevalence of the tuberculoid type is the precursor to a serious increase of the lepromatous cases later, but this does not appear to have occurred in Cebu so far. At any rate, more definite information regarding this point may be expected when the two towns are resurveyed by the same workers, possibly in 1962, 14 years after the last Cordova reexamination and 11 years after the latest Talisay survey.

In order to compare the annual attack rates for lepromatous leprosy in the combined population of the two towns in the presurvey and the observation periods, the same modified life table method employed by Doull *et al.* was again used by Guinto *et al.* (⁴) Results were expressed in attack rates per 1,000 person-years. In one of the tables, the attack rates for the lepromatous type are given by age groups. That table shows that the annual attack rate for the lepromatous type declined from 0.78 per 1,000 person-years in the presurvey period to 0.25 during the observation period.

Based on their data, the authors made the rough estimate that, during the two decades between 1920 and 1940, the attack rate among patients suffering from the lepromatous type declined at an average rate of 3 per cent annually, representing a decrease of the lepromatous type of 60 per cent during the 20-year period. Partial surveys made by

the stationary and traveling skin clinics in Cebu since 1951 have also shown a continuing downward trend of the lepromatous cases for the whole province.

In an important article which appeared in 1957, Davey ⁽²⁾ described the decline of leprosy observed between 1941 and 1956 in a group of Nigerian villages with a total average population of 3,057. The supporting data were obtained in an intensive-type survey in which more than 99 per cent of the resident population was examined at the outset (1941), and at 2 other reexaminations made in 1947 and 1955, the total observation period being 16 years. The prevalence per thousand was found to have been extremely high originally, 121 in 1941 and 170 in 1943, thereafter declining to 76 in 1947 and finally to 17 in 1955. This decline in prevalence was confirmed by the number of the new cases discovered each year. After a preliminary rise from 35 cases in 1941 to 45 in 1942 and a further increase to 71 in 1943, there followed a rapid yearly decline until the new cases were reduced to a mere 3 in 1955 and another 3 in 1956. There are other important data presented in this article, which has to be read in its entirety in order to be properly appreciated.

The new cases found each year during the intervening periods between the intensive resurveys were discovered by means of a case-finding procedure carried out by a leprosy inspector who made periodic surveys examining contacts and "observation" cases and inspecting newcomers. There was obviously a close parallelism between the initial rise and subsequent fall in prevalence and the corresponding rise and fall of new cases discovered each year. Thus, the incidence rate itself was not used as in Cebu surveys; instead, the number of new cases discovered was considered as the measure of the incidence of leprosy.

Davey went on to analyze the factors favoring the decline of leprosy in the particular group of Nigerian villages concerned. These included (a) mortality of leprosy patients, (b) removal of such patients from the area, (c) immunologic facts including the influence of tuberculosis, (d) public and personal hygiene, and (e) influence of the control measures. He concluded that the decisive factor was the control measures employed, made effective by the great cooperation of the people, including the hindering of the development of lepromatous leprosy by the treatment and the removal of open cases from overcrowded communities to an isolation village located at Ndi Oje.

It will be noted in the three articles that have been summarized, that surveys of the intensive type were employed in each case, involving a limited population with a high incidence of leprosy confined to a localized territory with a fairly stable population, which may not be representative of the whole country. Such intensive surveys would be practically impossible to perform in industrial areas with unstable populations. Moreover, due to the tremendous expense that would be

required to perform complete, repeated reexaminations of the entire population occupying a large territory carried on over a period of many years, it would obviously not be possible to undertake a similar type of epidemiologic survey covering an entire country. The problem may be partly solved by undertaking intensive surveys in carefully selected index areas in different parts of the country, and it is possible that this will be done in the Philippines after a certain stage of the program has been reached.

The main obstacle, however, is the lack of a simple diagnostic test in leprosy, comparable to the tuberculin test combined with photofluorography in tuberculosis and the serology tests in yaws, which would make mass examination for leprosy much less expensive and time-consuming.

Since, as already stated, the accurate method of securing prevalence and incidence rates to serve as base-line information and later to confirm the true trend of the disease in subsequent years is practically unattainable for a whole country, it is necessary to devise some other less accurate but more practical method of indicating at least the general direction of the trend by employing less accurate figures which could serve as substitutes for the incidence and prevalence rates.

On the other hand, the true rates obtained in limited intensive surveys can serve as a useful point of reference in confirming the prevalence of leprosy in a large province or country as obtained by less accurate methods. This was done by Rodriguez (⁸), who utilized the basic data obtained in the Cordova and Talisay intensive survey to reinforce his much simpler data obtained from all the 52 municipalities comprising the province of Cebu. The yearly admissions (excluding readmissions) of lepromatous-type cases to all leprosaria from Cebu province were compiled from 1904 to 1955 inclusive, or a period of 52 years.

For the first 26-year period from 1904 to 1929 inclusive, there were 5,290 admissions compared to the total of 2,882 during the following 26 years from 1930 to 1955 (this latter group including open cases discovered by the skin clinics), representing a reduction of about 54 per cent during the later 26 years, or about 2 per cent per year. While there may be some objections regarding the validity of these simple data for many reasons, among them being the fact that rates were not used, this finding gains some significance if the results of the intensive surveys of Guinto *et al.* in two of these municipalities (Talisay and Cordova) within this province are taken into consideration. As already stated, these writers estimate that between 1920 and 1940, the attack rates from patients with the lepromatous type of leprosy decreased by about 3 per cent at Cordova and Talisay each year.

II. RESULTS OF ESTIMATES OF THE PREVALENCE OF LEPROSY IN THE PHILIPPINES DURING THE PRESULFONE ERA

After reviewing the literature on the supposed effects in various countries of their respective policies of compulsory segregation, of home isolation, or of a combination of both methods during the later half of the last century and the first decade of the present one, Rodriguez (⁶) in 1936 attempted to determine the possible effect on the prevalence of the disease of the policy of compulsory segregation in force in the Philippines from 1907 to 1933. He was able to secure data on the total number of cases under segregation in all leprosaria of the country at the end of each year from 1907 to 1933 inclusive, but not the number of new admissions as the latter could not be distinguished from readmissions.

A table was presented showing an ascending curve in the number of segregated cases. This was characterized by a more rapid rise following the introduction of treatment with chaulmoogra ethyl esters at Culion, which was accompanied by improvement in the living conditions there which apparently made segregation there more attractive to patients, followed by an even more marked spurt after the establishment of the eight regional leprosaria beginning 1930. The whole period represented an increase in the number of segregated cases from 994 in 1907 to 8,195 in 1933, with no end to this ascent in sight. It is to be emphasized that these incomplete data for the entire country were based on the number *under segregation in the leprosaria*. During the same period it was possible to establish a downward trend among new admissions for lepromatous cases in Cebu province, where more accurate figures were available and where a pilot control program had been in operation since 1927. Doubtless a more fruitful use of the reports covering the whole country could have been made if the yearly number of new admissions to all the leprosaria were available, in addition to the number of patients in these institutions.

Moreover, the writer in his capacity as general supervisor of treatment stations, as the regional leprosaria were then called, was aware that the swelling total of segregated cases included an equally increasing number of patients who had become bacteriologically negative after admission but who refuse to be discharged, as well as a good number of "negative" cases waiting to be "paroled." Neither was it possible to exclude healthy children born in the leprosaria, who are all included in the monthly reports of inmates to be subsisted.

After publication of the article cited, further studies led to the conclusion that, in order to arrive at a better picture of the approximate prevalence of segregated "open" cases, it would be necessary as a first approach to reclassify all such cases in the sanitarium, so that a list might be compiled which would include only those with active leprosy,

from which would be excluded those that had become "disease arrested" but had remained in the sanitarium.

If, at the end of each year, all new admissions (but excluding readmissions) were to be added to such lists of active cases, and at the same time the deaths and disease arrested cases were deducted (taking care not to include transfers to other leprosaria, absconders, etc.), the results would give the balance remaining in the "active list" at the end of any given year. Thus a more realistic picture of the situation involving all open segregated cases would be available.

This was already being done since 1930 in the Cebu Sanitarium. The result being satisfactory, the same procedure of balancing the active list was also followed among patients under the stationary and the traveling skin clinics. By combining the reports of the Cebu leprosarium (i.e., the Eversley Childs Sanitarium) and the skin clinics, a list of active cases for the entire province of Cebu could be prepared. It was possible to compile this vital information in Cebu because there was already existing since 1930 a coordination of the activities of a regional leprosarium, a stationary skin dispensary, and a mobile skin clinic, all engaged in case-finding, case-holding, follow-up and reporting. This pilot set-up served as the model for the expanded control program which is now in operation over the entire country.

An article appearing in 1938 (7) represented another effort to obtain information about the prevalence of the lepromatous type for the whole country, based on the total cases under segregation as of July 1, 1938. The data were classified as to sex, age, and province of origin of the cases. After this information became available, it was possible to make yearly comparisons of segregated cases in this respect. Since the establishment of the skin clinics, all bacteriologically-positive cases discovered were included, whether segregated or not. In an unpublished report comparison made as of January 1, 1959, the prevalence rate for open cases per 1,000 population was found to be 0.53, compared to 0.69 in 1938. The decrease seems slight, but it should be remembered that case-finding became much more active after the establishment of the mobile as well as the static skin clinics. Data of this kind cannot, of course, be depended upon to indicate in the future the true trend of the lepromatous type of the disease, and no information is given with regard to the nonlepromatous types.

III. FACTORS AFFECTING THE DEVELOPMENT AND COURSE OF THE PHILIPPINE LEPROSY CONTROL PROGRAM

In view of the failure to obtain useful base-line data in the past, it was planned that in the further development of the leprosy control program the necessary information would be obtained in the monthly and annual reports of the field units from which, it was hoped, an evaluation of the whole program might be arrived at. In order better to under-

stand the nature and extent of the data collected and analyzed, it is necessary to review briefly the development of the leprosy control program in the country.

Beginning in 1930, the first major modification of the original policy of compulsory segregation of all open cases in the Culion Leper Colony and at San Lazaro Hospital (Manila), was the decentralization of places of segregation through the establishment of eight regional leprosaria (now known as *sanitaria*), strategically located in the centers of important foci of the disease situated in different parts of the country. The last of these institutions, the Central Luzon Sanitarium, was not established until 1938.

Another step forward was the acceptance in principle of the policy of outpatient treatment of closed cases by the stationary and ambulatory skin clinics, after it was established that such cases existed in large numbers. This policy was first tried out in a pilot leprosy control program conducted by the writer in the province of Cebu during the decade 1928-1937. These clinics were proved to be effective in promoting early voluntary presentation and the detection of both closed and open cases, leading to early treatment. They were also found useful as centers of health education and propaganda about the disease.

The operation of the pilot program was guided from the very outset by the findings of field surveys undertaken by the government staff^(5,9) followed later by the intensive studies conducted by the Leonard Wood Memorial in their epidemiologic investigations, the results of which have been reported in a series of articles. Among the initial findings of the government surveys cited above was the observation that, on the whole, the distribution of leprosy in Cebu was distinctly focal in character, the foci ranging in size from a group of a few houses to large territories covering several towns. The largest such focus was found to have the capital city of Cebu itself as its center and to cover the surrounding municipalities of Opon, Cordova, Mandawe and Talisay, the territory extending over a roughly circular area having a diameter of about 18 miles. Within this large focus were smaller foci, many of which were bounded by certain streets or limited to certain barrios and surrounded by areas of low prevalence.

Another rather surprising discovery was the failure to find evidence that any large new focus had developed in this province since 1907, when records began to be kept. Nor had any of the known foci appreciably increased in size. In other words, the disease in Cebu during this period had not spread horizontally or peripherally but rather vertically (or downward), the persistence of the disease being due chiefly to transmission to close contacts within the individual foci.

The reports of the existing 10 traveling skin clinics, which are in effect also conducting surveys of the "rapid type" in connection with their routine activities of case-finding, case-holding and follow-up,

together with those of the local health officers, have indicated that a focal pattern of distribution of the disease is also discernible throughout the Philippines with two notable exceptions. These exceptional areas are in the Bicol Peninsula, where the foci appear to be diffused or not well circumscribed, and in certain parts of Palawan Province and the Mountain Province, where there had been occurring—particularly during the last two decades—an apparent rapid spread of leprosy reminiscent of the Nauru type of “epidemic” (^{1,11}), without any distinguishable focalization. This last development is taking place among tribes which originally had been pushed to the interior by the Malay settlers arriving later, and had lived in inaccessible places ever since, supporting themselves by hunting and agriculture in the Mountain Province and by fishing in Palawan, and avoiding contact with the Christian Filipinos. In recent decades, however, gradual intermingling has been taking place, and after some years of this many more cases of leprosy have been admitted to the sanatoria from these two provinces than in the past. Preparations are being made for conducting local field studies of these provinces in the future.

The epidemiologic finding that the disease does not spread from the existing foci toward the relatively clear areas separating the foci, leads to the important assumption that if it were possible to control the disease within these foci, it would not be likely to flow back into it from another focus, again to reinfect the population of the cleared area, except perhaps for the unlikely development of degeneration in health and economic standards in the meantime or the immigration into the area of a more susceptible population. This probability suggests that in case of limited funds for starting a leprosy control program in a country with more or less the same epidemiologic features as those obtaining (as a whole) in this country, control work could be initiated in one or more important foci with a reasonable expectation of producing a significant impact on the leprosy situation of the entire country as a whole. An example may be drawn from Philippine experience: In the two large foci located in the Provinces of Cebu and Ilocos Sur, with a combined population of 414,267 or barely 1/50 of the total population of the country, there were as of January 1, 1961, 2,254 cases of leprosy representing about 1/6 of the total number of active cases in the country. Control of the disease in these two large foci alone will produce a sizeable reduction of the leprosy problem of the Philippines.

The uneven or spotty distribution of leprosy in the Philippines is further indicated by the fact that, whereas the prevalence rate based on registered cases for the entire country was 0.49 per thousand as of January 1, 1961, the geographic distribution ranged from 0.07 per 1,000 for Romblon Province to 2.6 per 1,000 for Ilocos Sur.

Another epidemiologic feature of practical importance is the relatively high proportion of the lepromatous type, in contrast for instance

with the extremely low proportions of this type reported in many regions of Africa. In all the surveys made in the Philippines, including the Leonard Wood Memorial field studies, this proportion has been from 40 to 46 per cent of the total cases discovered. In planning the campaign, this fact had to be taken into consideration, particularly in view of the tendency of the sulfone treatment (particularly DDS) to increase the frequency and severity of acute lepra reaction in this type, which in the more severe attacks necessitates a reduction, if not a prolonged cessation of the treatment, thereby impairing its effectivity.

The results of the Leonard Wood Memorial surveys are fundamental and are applicable in the formulation of any control program. We in the Philippines have taken full advantage of their discoveries, including the classical one that when the primary cases were of the lepromatous type, the risk of developing any type of leprosy, for household associates, was about eight times higher than that for persons not exposed to leprosy in the household, and was four or more times as great as when the primary case was neural, all of this occurring in localities with a relatively high prevalence of the disease.

Local conditions that have a direct influence on the leprosy control program include local customs, the social attitude of the people toward the disease, and the reaction of the patients themselves upon being discovered to have the disease. The emphasis on the treatment of ordinary skin diseases and the establishment of the skin clinics themselves are concessions to the local idiosyncrasies of the people in order to attract them to the clinics with the ultimate aim of early finding and treatment of cases.

The latest important development in connection with the control program took effect after approval by Congress of Republic Act No. 753, otherwise known as the Liberalized Leprosy Segregation Law, which authorizes the Director of Hospitals (now the Director of Disease Control) to permit:

"...any legally and technically qualified physician to engage in the treatment of persons with leprosy or any person supposed to have leprosy in any place under conditions and regulations prescribed by the Director of Hospitals with concurrence of the Director of Health and approval of the Secretary of Health."

Thus, domiciliary treatment was permitted under certain conditions. At the same time, however, the law provides that the Director of Health or his authorized representative may turn over any suspected person found positive for *M. leprae* to the Director of Hospitals or his authorized representative for isolation and segregation.

There are at the present time three types of institutions employed to implement a coordinated control program in the country, namely:

1. *The Sanitaria*, of which there are eight, one of which is the old Culion Leper Colony (now the Culion Sanitarium). Of the original 8, one of the smaller ones was closed due to administrative difficulties;

the Central Luzon Sanitarium was added later. The sanitarium are intended for the hospitalization of the following types of cases:

- (a) Open cases which constitute a financial burden to the family.
- (b) Cases considered potential sources of contagion due to their gregarious habits, including those who refuse to limit their social and occupational activities during the infectious stage of the disease.
- (c) Those who expose many children and other susceptibles in their households.
- (d) Lepromatous cases that fail to improve under home treatment after several years, or who need special treatment.
- (e) Patients requiring physical and occupational rehabilitation.

The sanitarium have a combined capacity of 8,050 beds. The unit cost of maintenance comes to an average of 650 pesos per patient per year.

2. *Stationary Skin Clinics.*—This type of institution is designed to deal particularly with such foci as the ones in Cebu and in Ilocos Sur already discussed. In order to assure the successful operation of a stationary clinic, the prevalence rate must be at least 5 per thousand, the population should not be less than 150,000, and there must be adequate and cheap means of transportation permitting easy access to the clinic. The open cases treated in such clinics, consisting of reactive tuberculoid cases and borderline cases, as well as early lepromatous cases, are carefully selected and dealt with individually, taking into consideration the occupation, facilities for home segregation, and other factors. The best results are obtained if the stationary clinic operates in close cooperation with a neighboring regional sanitarium to which are referred all cases falling under the categories listed in the preceding paragraph as suitable for hospitalization in sanitarium.

Under local conditions, the per capita cost of new cases discovered and treated in the stationary skin clinics entail an average per cost of 46 pesos per year. These clinics serve as very useful centers for health education and information of the public with regard to leprosy.

The Cebu and Ilocos Sur Skin Clinics were established in 1928 and 1930, respectively. The Manila Skin Clinic, established in 1948, is attached to the Leprosy Research and Training Center in Manila. Besides being located in a large focus, it enjoys a carefully built-up reputation of being the best center in the country for the diagnosis and treatment, not only of leprosy but of difficult cases of skin diseases as well. It is attended by specialists, and proper laboratory facilities are available. Cases are referred to it by private physicians, health officers, nurses, public health workers, school teachers, public officials, and by others from every province in the country, but most patients come of their own accord. All services rendered are free of charge. The fourth and last stationary clinic, the Biñol Skin Clinic, established in 1930 and located at Legaspi, Albay, is an example of a mislocated stationary clinic. The selection of this site was imposed by political exigency in order to secure budgetary support for the rest of the program.

3. *Traveling Skin Clinics.*—Although there was a traveling skin clinic in operation in Cebu Province since 1930 during the pilot project, using an ambulance donated by the Leonard Wood Memorial, the present comprehensive system was made possible by the introduction of DDS as treatment and UNICEF/WHO aid. This all-important help, which continues to the present, made possible the putting of two traveling clinic units into the field in 1955, followed by three others in 1957 and the last five in 1959. The territory assigned to each unit depends on geographic proximity among the 29 endemic provinces. The average population covered by each of these clinics is 1,500,000 inhabitants, and the numbers of active cases served range from 461 to 1,986, with an average of 985 cases for each.

The actual antileprosy treatment is administered by personnel of the rural health units, each under a municipal health officer. An original preliminary orientation course given at the first visit of the leprologist in charge of a traveling skin clinic is supplemented by regional general training courses for rural health personnel in which leprology is one of the subjects taught. Duplicates of the history and all records of each patient under them are available in their offices, and the treatment records are kept by them. All new cases discovered are referred immediately to the leprologist in charge of the traveling skin clinic covering the territory, while the nursing attendant attached to this clinic makes regular monthly rounds to check regularity of attendance by the patients. Annual clinical and bacteriologic examinations are made by the leprologists; the percentage of patients thus examined ranged, in 1960, from 65 per cent by the Ilocos Clinic to 85 per cent by the Cebu Clinic.

The cost per patient per year found and treated by the traveling skin clinics averaged about 75 pesos. The expenses covering salaries and wages of the personnel of the rural health units corresponding to the time devoted by them to leprosy treatment are not included in this estimate.

As already stated, a system of reporting was concurrently being carried on as the program progressively developed. The data thus obtained are compiled and summarized in such a manner as to yield data suitable for the purpose of evaluation.

With the reorganization of the Department of Health in 1959, when the administrative control over all the field units, including sanitarium and skin clinics, was transferred from the Central Office to the corresponding directors of the Regional Offices, such evaluation became even more important because they provided a guide to the headquarters staff in the Division of Sanitarium, Bureau of Disease Control, as to the effectiveness of the implementation of the plans and programs it has established. Incidentally, after the reorganization, the Regional Directors assumed the responsibility of integrating the leprosy program with the regular health organization at the provincial and local levels.

IV. CHEMOTHERAPY AS THE MAINSTAY OF THE LEPROSY CONTROL PROGRAM

The sulfone drugs did not reach the Philippines until after the end of World War II, and because of the destructive effects of that war on the economy of the country their routine use in the different leprosy institutions was not possible until 1952. By that time the dosage, manner of administration, side-effects and other information about their use were already known in other countries. However, in accordance with established practice, these preparations were first tried out under controlled conditions in order to work out the proper dosage for Filipino patients. The experiments were conducted in the Central Luzon Sanitarium by the writer from 1947 to 1951, testing such preparations as Promin, Diasone, Diamidin, Sulphetrone, DDS and sulfadiazine.

These trials showed that Filipino patients as a rule do not tolerate any too well the doses that were advocated by other workers at that time. It was indeed a surprise to find that out of 3 groups placed under various doses of DDS, the patients receiving the lowest initial dose, equivalent to 100 mgm. twice a week, followed by a gradual increase over a period of 3 months to reach the maintenance dose of 100 mgm. a day, showed the best results at the end of the trial.

Extensive hemoglobin determinations done routinely by the traveling skin clinics preliminary to DDS treatment indicate that the low tolerance of Filipinos to DDS may be partly due to the existence of a mild degree of anemia which is present in the general population over extensive parts of the country, particularly among the women and children, which is possibly due to some iron deficiency in the diet. Poor tolerance is also shown by people harboring hookworms, and by those with heavy infestations of other intestinal parasites.

In order to find out how DDS should be employed in ambulatory treatment, a "Skin and Tumor Clinic" was established in Manila in 1949, using the dosage already established for Filipinos. It was found advantageous to give individual attention to the dosage during the first 3 months, after which less supervision is required.

Response to outpatient treatment during the last 5 years has been favorable enough to lend support to the concept that treatment with DDS, by shortening the duration of the disease and therefore its period of infectiousness, will probably lead to a diminution of the infectious potential of leprosy in the community and result in the gradual reduction in the number of new infections. The successful implementation of this concept requires sustained treatment carried on over a period of years, until the active cases become disease-arrested. Simultaneously, active case-finding must be maintained, so that the treatment may be instituted at the earliest time possible, perhaps even before the patients become infectious.

Considering the relatively high proportion of the lepromatous type in the Philippines, it is to be expected that sulfone treatment will pro-

duce a considerable number of severe acute lepra reactions in the more advanced cases. The number and severity of such reactions can be considerably reduced by starting with a preliminary small dose and by insistence on slow, graduated increase in dosage.

Future plans of the program include extension of the facilities for treatment to every municipality in which a patient with leprosy lives, in order that every known case may be placed under medically-supervised treatment.

The emphasis on treatment does not imply that other prophylactic measures are being overlooked. With regard to chemoprophylaxis, again in line with standing policy, pilot studies are being made in two leprosaria where children born of leprosy patients are found, to determine the doses that can safely be taken over long periods by children with some promise of protection, instead of instituting a nation-wide use of this untried measure at once.

Still to be implemented is a pilot project to work out how BCG vaccination as a prophylactic measure against leprosy may be integrated with the national BCG program against tuberculosis. The principal difficulty with regard to a BCG campaign at present is to ensure that the vaccine reaches the patient in a fully viable state.

The general philosophy behind the leprosy control program in this country may be stated as follows:

The basic aim of the leprosy control program is to place all cases of leprosy with active manifestations of the disease under sustained sulfone treatment until they become disease-arrested. Such treatment should be undertaken by agencies that can best provide the particular requirements of each patient, and can subsequently follow up the results.

The treatment is expected to shorten the period of infectivity of open cases, and even those who are not rendered bacteriologically negative are presumed to become less infectious. Since the low infectivity of leprosy under ordinary conditions is well established, such sustained treatment is sufficient to produce fewer and fewer new infections, thereby eventually leading to the control of the disease.

This policy entails the obligation of making periodic evaluations of the results obtained by the program, particularly its long-range impact on the prevalence of the disease, in view of the assumptions that have been taken which have to be corroborated by statistical evidence.

(The list of references will appear in the second part of this article in the next issue.)