EVALUATION OF THE LEPROSY CONTROL PROGRAM OF THE PHILIPPINES

II. APPLICATION AND MANNER OF ANALYSIS[1]

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SELF-EVALUATION OF THE PROGRAM

With the introduction of the last five of the ten traveling skin clinic units in the Philippines toward the middle of 1959, the coverage of the endemic leprosy areas became much more adequate. At the same time, it was possible to reorganize the personnel at headquarters to permit full compilation, consolidation, and tabulation of the reports from the different units, which in the meanwhile had been improved upon and standardized. For the first time, therefore, data for the purposes of evaluation of the entire program became available in the reports for that year.

In the course of the compilation, however, certain deficiencies were noted and subsequently corrected in the following year. Thus the improved 1960 reports now supply the base-line data with which the proper comparisons will be made in future analyses.

Three lines of evaluation.—The system of appraisal of the program is along three lines:

A. Evaluation of the case-finding procedures and results
B. Evaluation of the treatment
C. Evaluation of the probable trend of leprosy

The list of active cases and movement of patients.—Table 1 contains data concerning the year 1960 compiled from reports similar to those submitted by hospitals and similar institutions which require information as to the total number of patients served and for how long, usually known as "movement of patients" in the institution. Such reports have been rendered by all the sanitaria for many years; it was only necessary to extend the system to the stationary and the mobile skin clinics. Moreover, refinements were introduced with the object of making the data as suitable as possible for the purpose of evaluation.

The aim is to maintain a balance-sheet account of cases with active leprosy lesions by adding the "new" cases to the total of the preceding month and subtracting those "dropped" from the list during the corresponding period, to obtain the number remaining at the end of the month.

The system requires the maintenance of "live" leprosy registries at the national, institutional and provincial levels. The leprosy cases

[1] Conclusion of article begun in THE JOURNAL **30** (1962) 111-124.
[2] Retired as of December 1, 1961.

TABLE 1.—*Movement of patients on the active list during the year 1960.*

Unit	No. on list Jan. 1, 1960	New cases, 1960	Dropped		No. on list, end of 1960
			Disease arrested[a]	Deaths	
Sanitaria					
1. Culion	1,324	36	9	56	1,295
2. Central Luzon	2,202	262	124	34	2,306
3. Eversley Childs	905	104	143	15	851
4. Western Visayas	565	99	37	20	607
5. Bicol	362	22	11	8	365
6. Mindanao Central	293	90	10	6	367
7. Cotabato	194	75	21	3	245
8. Sulu	99	53	5	2	145
			360	144	
Sub-total	5,944	741	504		6,181
Stationary skin clinics					
1. Leprosy Research	1,249	695	23	1	1,920
2. Cebu Skin Clinic	886	282	39	6	1,123
3. Ilocos Skin Clinic	539	136	16	3	656
4. Bicol Skin Clinic	283	61	—	—	344
			78	10	
Sub-total	2 957	1,174	88		4,043
Traveling skin clinics					
1. Cebu Traveling	451	92	101	3	439
2. Iloilo Traveling	499	118	99	2	516
3. Ilocos Traveling	767	93	58	11	791
4. Pangasinan Trav.	498	96	117	3	474
5. Leyte-Samar	272	73	30	2	313
6. Southern Tagalog	75	45	3	2	115
7. Central Luzon	128	105	13	5	215
8. Bicol	49	29	—	1	77
9. Western Mindanao	63	67	—	—	130
10. Eastern Mindanao	67	104	6	1	164
			427	30	
Sub-total	2,869	822	457		3,234
			865	184	
GRAND TOTAL	11,770	2,737	1,049		13,458

[a] "Disease arrested" for the skin clinics; for the sanitaria, "released" and "discharged," as explained in the text.

filed in these registers are considered as belonging to the "list of cases with active lesions," but more commonly referred to as the "active list," and henceforth so designated in this article.

For the national active list, only newly-discovered cases can be added each month, and no cases other than those who had died or had become "disease-arrested" can be dropped. Those who are found to have relapsed among those dropped as disease-arrested are regarded

as new cases. On the other hand, for the local active lists, e.g., those for each sanitarium, cases to be added (but distinguished separately) include not only new cases but also readmissions and transfers from other units, while dropped cases also include transfers to other units, absconders and discharges "for other causes."

In the local active list of skin clinics, both stationary and traveling, transfers from other units and discovered absconders from the sanitaria are added (but recorded separately) while those to be dropped include transferred patients to regions outside of the territory of each unit, in addition to those that died or had become disease-arrested.

Thus the number of cases remaining in the national active list may not necessarily coincide at the end of each month with the total of cases in the local active list. However, the total new cases are always the same.

The maintenance of a national registry prevents the same patient from being reported by different units two or more times, thereby erroneously augmenting the total in the national list. For instance, a patient presenting voluntarily for admission to a sanitarium may have already been reported as a new case by a stationary or mobile skin clinic.

It is obviously important that only confirmed cases of leprosy should be reported as new cases. Although a few errors in diagnosis cannot be avoided, too many such mistakes and excess of "overdiagnosis" can prove fatal to the purpose of evaluation. We are fortunate in having enough leprologists attached to the units to confirm practically all diagnoses. More and more of the rural health physicians are also being trained in the diagnosis of leprosy. However, the writer is aware that paramedical personnel can also be trained to make good diagnoses, but in such cases many months of training would seem to be necessary.

Referrals.—A system of referrals has been established to follow up transfers from one unit to another and from one of the specialized units to a regular health unit or vice-versa. Copies of the transfer forms are forwarded to a referral office at headquarters, which sees to it that the referrals result in one unit receiving the transferred patient on its active list, while he is dropped from that of the original unit. Referrals are not always successful, because many patients do not wish to be known in their communities as having leprosy and evade all efforts to trace them there, even to the extent of migrating to other provinces without leaving their new addresses.

New cases.—Study of all information about new cases is necessary in evaluating the program, but unless properly analyzed and interpreted such attempts may lead to grievously mistaken conclusions. Some simple data regarding the new cases discovered in 1960 appear in Table 2. Although only one year apart, the corresponding figures for 1959 are also shown for the purposes of comparison, no other choice being possi-

ble as there are no comparable figures for other years. There were 2,737 cases discovered in 1960, which was about 10 per cent less than the total of 3,048 found in 1959. This decrease is probably of no importance whatsoever as an indication of change in the prevalence of the disease; more likely it is due to some change affecting the case-finding procedures and should be considered from that angle.

TABLE 2.—*Summary of new cases of leprosy discovered during 1959 and 1960.*

Data on cases	1959		1960	
	Number	Percentages	Number	Percentages
1. Total number	3,048	—	2,737	—
2. By sex:				
Males	1,892	62.1	1,743	63.7
Females	1,156	37.9	994	36.3
3. Agencies responsible for finding new cases:				
a. Sanitaria	696	22.5	741	27.1
b. Stationary skin clinics	1,345	44.2	1,174	42.9
c. Traveling skin clinics	1,007	33.2	822	30.0

More to the point, Table 2 shows that in 1960, 27 per cent of the new cases were discovered by the sanitaria, 43 per cent by the stationary skin clinics, and 30 per cent by the traveling skin clinics, once more confirming information obtained in previous years that the most successful device for case-finding in this country is the stationary skin-clinic.

On the other hand, Tables 1 and 2 indicate that the sanitaria also attract new cases which by-pass the clinics and also the rural health units, showing that under Philippine conditions they also play an important role in case-finding. Obviously, living conditions in the sanitaria appear to be quite acceptable to the patients, compared to their generally poor existence at home.

With regard to sex, the usual ratio of 2 males to 1 female is observed.

If the number 2,737 of newly discovered cases for 1960 were used as the numerator of a fraction with the total population 27,783,347 of the country as denominator, a resulting rate of 0.0985 per thousand or 9.85 per 100,000 is obtained, which may be designated as the "discovery rate" for that basic year. Incidentally, the corresponding rate for 1959 was 0.1132 per thousand, or 11.32 per 100,000.

Dropped cases.—It is necessary to adopt certain arbitrary rules for declaring patients to be "disease-arrested" in order that they may be dropped from the active list.

For bacteriologically positive cases: The negative period begins when the bacteriologic examination becomes negative and there are no longer any indications of clinical activity. In the sanitaria, all such

examinations are done by a local committee, and its findings are subject to confirmation by a National Disposal Committee. After the expiration of the generally-accepted negative period of two years, to be spent in the sanitarium, the candidate is "discharged," although he may be "released" after a negative period of only one year, with continued treatment and reexamination outside the sanitaria by the skin clinics or rural health physicians.

For bacteriologically negative cases: Most closed cases belong to the tuberculoid type. Such patients are considered to have become disease-arrested, and are dropped from the active list, one year after all signs of clinical activity have disappeared.

The following are considered as signs of clinical activity: (1) redness of lesions, (2) elevation of lesions, (3) increase in size or number of lesions, and (4) changes in degree or extent of anesthesia.

The arbitrary period of 1 year after subsidence of signs of activity required before a case is declared disease-arrested is based on the experience of the writer in following up the progress of early bacteriologically-negative lesions ([10]). However, this period may be maintained, shortened, or lengthened in the future according to the rate of relapses or clinical reactivations observed and the periods that will have elapsed before the appearance of relapse. Many patients prefer to continue treatment even if they have been declared disease arrested and dropped from the active list.

Using the above criteria for arrest of the disease it was found, as noted in Table 1, that during 1960 the sanitaria had released or discharged 360 cases from among an average total patient population of 6,037, giving a rate close to 6 per cent in one year. This rate has been downgraded by the exceedingly low number of releases and/or discharges from the large Culion Sanitarium, with only 9 discharges during the entire year. Incidentally, this figure, coupled with the scanty number of new admissions (36 during 1960), shows that Culion no longer plays a major role with regard to the ultimate aim of leprosy control. On the other hand, the release and/or discharge rate of the Eversley Childs Sanitarium came to 16 per cent of the population in one year, an average it has maintained, and in some years surpassed, during the last 5 years. This excellent record is probably a result of the close supervision exercised over the administration of the DDS, which is swallowed by the patients in the presence of one or more nurses or attendants.

With regard to the stationary skin clinics, there were comparatively few dropped cases in proportion to the number of patients in their active lists (78 cases, or 2.2%) in spite of the large numbers of non-lepromatous cases which were bacteriologically negative to begin with. This indicates that while the stationary skin clinics are unexcelled for case-finding, they do not do as well in case-holding and treatment.

The main reason for this is the failure of many patients to report after a few visits, thereby missing the treatment and preventing the leprologists from recording the date when signs of activity were no longer present.

The remedial measures undertaken after these deficiencies were brought to light by evaluation included the assignment of two new follow-up personnel to each of the stationary clinics, the establishment of subcenters under the same clinics served by their existing personnel, and constant reminders to the leprologists in charge not to fail to note in the patients' charts the dates when all signs of activity had disappeared.

Balancing the new and dropped cases on the active list.—Table 1, besides indicating the movement of patients on the national active list during 1960, also furnishes such details as the number of patients on the respective active list of the different units at the beginning of the month or year; the number of new cases discovered by them; the number dropped, which includes deaths and disease-arrested cases; and those remaining on their active list at the end of the month and year.

As of December 31, 1960, there was a total of 13,458 patients on the national active list. Based on the estimated total population of the Philippines for that year (27,783,347), the prevalence rate among registered cases on the national list was found to be 0.4844 per 1,000, or 48.44 per 100,000. This may be considered as the best available baseline prevalence rate for the Philippines program, to be used in future analyses. The corresponding rate for 1959 was 0.4635 per 1,000 or 46.35 per 100,000.

It is seen also in Table 1 that, as of the end of 1959, 6,181 cases were under the care of the 8 sanitaria, 4,043 were under the responsibility of the 4 stationary skin clinics, while 3,234 were cared for by the 10 traveling skin clinics. It is likewise shown that in 1960 the new cases, totaling 2,737, exceeded the number of dropped patients, numbering 1,049, by 1,688, leading to an increase of patients on the active list during the year from 11,770 to 13,458.

The ultimate objective of the leprosy campaign is to overcome this unfavorable balance between the new and the dropped cases, that is, to increase the number of dropped cases through better methods of administering the treatment and of reporting the results of treatment, as well as by consistent efforts to improve case-finding in order that the early cases may be placed under treatment as soon as possible. This desideratum can be achieved only by perfecting the methods of case-finding, case-holding, treatment, and follow-up with maximum utilization of facilities available. On the other hand, an increasingly favorable balance cannot be maintained over a period of years unless the disease itself is decreasing at the same time. Ultimately, therefore,

this balancing procedure may be expected to lead to some definite indication of the direction which the trend of leprosy is taking.

If the disease were decreasing, the number of new cases should show diminishing numbers through the years, perhaps after a preliminary increase due to better case-finding as reported by Davey ([2]), associated with an increasing number of dropped cases due to effective treatment, until the balance is gradually tilted in favor of the latter. If the program were based on wrong premises or were imperfectly implemented or did not have adequate coverage, then the number of new cases as well as those remaining on the active list would either show no real consistent change or else show increases.

However, it is to be emphasized that, for reasons already stated, the movement of patients on the active list as reflected in Table 1 should be interpreted with caution when assessing the effects of the program on the prevalence of leprosy during the first years of evaluation. At the same time, care should be exercised that in comparing the work which will be accomplished in certain years or periods of years, consideration should be given as to whether conditions are comparable with those of 1959 when the base-line data were established. With these precautions in mind, Table 1 can be of much value in evaluating the success or failure of the control program. In spite of its obvious simplicity, the method does reflect the long planning and many laborious years that were required to establish and maintain the organization which is producing the work and the reports on which it is based.

A. EVALUATION OF THE CASE-FINDING PROCEDURES AND RESULTS

Although, as already noted, some information leading to an assessment of the case-finding methods is available in Table 1, the most useful data are obtained directly from summary tabulations of the monthly reports of the stationary and especially the traveling skin clinics, which have been designed to furnish the necessary basic data for this special purpose. From these tabulations the accomplishments of the individual traveling skin units during any given month can be compared with one another.

These tables of the traveling skin clinics detail the number of new cases discovered among the special groups examined during the rapid-type survey, namely: (*a*) school children, (*b*) contacts of old and newly-discovered patients, *(c)* suspected cases reported by officials and other persons, and *(d)* persons attending for skin consultations. The new cases are classified as to whether they are bacteriologically positive or negative, as to the type of the disease, and as to age and sex and other features. The number of people examined in the different groups is also given. This compilation is obtained from the local active list of each clinic, and perusal of it reveals items that do not fit with data given in Table 1, which is based on the national active list.

The number of new cases discovered by the traveling skin clinics from the above-mentioned 4 sources every year during a 5-year period from 1956 to 1960 inclusive, are shown in Table 3. The very few cases found among the school children will doubtless be a surprise to many leprologists. The explanation is very simple: it is due to the good entrance physical examinations of all children in public schools conducted by school physicians, rural health physicians, school nurses and surprisingly well-trained teachers, who apparently, with few exceptions, screen out cases of leprosy from the schools throughout the Philippines. Most of the cases found among the school children by the traveling skin clinics show only a few macules in covered parts of the body, particularly the buttocks.

TABLE 3.—*Sources of new leprosy cases discovered by the traveling skin clinics yearly from 1956 to 1960.*

Sources of new cases	1956		1957		1958		1959		1960	
	No.	%	No.	%	No.	%	No.	%	No.	%
1. School children examined	13	5.9	78	7.9	26	3.7	20	2.0	7	0.8
2. Contacts examined	44	20.1	257	25.9	121	17.2	166	16.5	173	21.1
3. Skin clinic consultations	91	41.5	316	31.9	264	37.6	434	43.1	387	47.1
4. Information received[a]	71	32.4	340	34.3	293	41.6	387	38.4	255	31.0
TOTAL	219	99.9	991	100.0	705	100.1	1007	100.0	822	100.0

The best source of new cases from year to year (except in 1957 and in 1958) is the popular daily skin consultations carried on during the period of the visit of the traveling clinic in each town; followed in importance by examination of suspected cases reported by town people, usually the neighbors of newly discovered cases; then by examination of house contacts; and lastly, as the poorest source, examination of the school children.

Duration of leprosy among new patients.—The duration of leprosy from the time the signs and symptoms were first noted by the patients to their discovery by the case-finding devices of the program, should also serve as a measure of their effectiveness. Table 4 gives the duration at the time of the discovery of the cases, based on information given by the patients themselves, sometimes confirmed by housemates, in one-year periods up to and including 11 years; thereafter, durations of 12 years and over are grouped together. Figure 1 gives a graphic representation of the differences in the percentage distribution of the duration for 1960 and 1959, more for the purpose of testing the validity of the 1960 figures than for making any direct comparisons.

In this study the 12-years-and-over group has been broken up into smaller groups (not shown in Table 4) so as to permit a more accurate determination of the mean duration which was found to be more or less identical, being 3 years and 5 months for 1959 and 3 years 7 months for 1960. The range for both years, moreover, varied widely from 1 month to 68 years. From data also not found in Table 4 it was possible to pin-point those municipalities from which came most of the cases of long duration, thereby indicating the places where the case-finding had not been complete in previous years and therefore should be intensified.

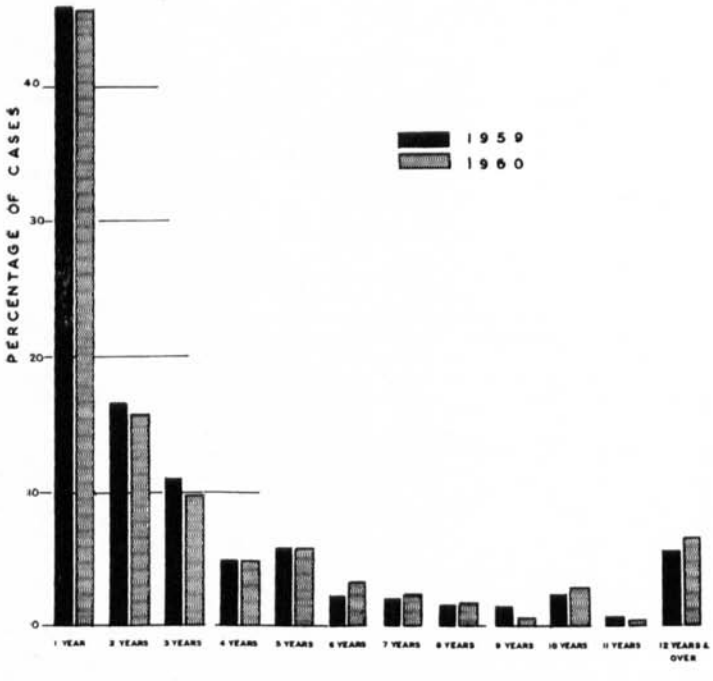

FIG. 1. Percentage distribution of the duration of the disease in new cases discovered in 1959 and 1960.

The scientific value of determining the duration of the disease up to the time of discovery is questionable. At best the evidence is only second hand, supplied by persons who cannot be expected to be too observant, although the leprologists do check the stated duration with the clinical appearance of the lesions. An important point shown by the table is that facilities are now available in the field to which many new patients can go or be brought to, so that they can be examined and treated within a year after the observed appearance of the lesions. That occurred in 46 per cent of the new cases discovered during both years. Facilities and methods of case-finding should be further extended so as to reach all new patients to be discovered in the future.

From Figure 1, which is based on data given in Table 4, it will be seen that there is a gradual decrease in average duration each year up to eleventh year, except for slight increases in the duration of 5 and

TABLE 4.—*Duration of leprosy in new cases discovered in 1959 and 1960*

Duration (years)	1959		1960	
	No. of cases	Percentage	No. of cases	Percentage
1	1,401	46.0	1,250	45.7
2	495	16.2	428	15.6
3	336	11.0	273	10.0
4	152	5.0	135	4.9
5	183	6.0	166	6.0
6	77	2.2	92	3.4
7	64	2.1	73	2.6
8	43	1.4	46	1.6
9	42	1.4	18	0.7
10	70	2.3	76	2.9
11	21	0.7	8	0.3
12 plus	164	5.4	172	6.3
TOTAL	3,048	99.7	2,737	100.0

10 years due to a tendency of many patients to give these round figures instead of more exact ones. The existence of patients with durations of 12 years or more, representing 6.3 per cent of the total, would indicate that there are still quite a number of long-standing cases to be discovered, but the important figure is the average duration. This should show a continuing decrease as the case finding becomes more and more effective.

Table 4 also supplies data for 1960 that will be useful in future analyses. In that year, there were 1,250 new cases discovered with a duration of one year or less. Based on the stated estimated total of the population, a rate of 0.045 per 1,000 or 4.5 per 100,000 is obtained. This may be taken as a substitute base-line annual incidence rate for the program.

B. EVALUATION OF TREATMENT

Tables similar to Table 1, which give the movement of the population on the active list, show basic data available from month to month with regard to the general effect of the treatment leading to the production of disease-arrested cases as achieved by each unit, and also by the three main types of units. However, the main data available for the evaluation of the result of the treatment are obtained from the so-called "progress reports of the treatment," a form of semi-annual report which was introduced at the Culion Colony in 1922 by Dr. H. W. Wade. The tabulated report furnishes details of the results of the treatment as revealed by periodic clinical and bacteriologic examinations of each patient. They also provide such details as the antileprosy medication used, the dosage, and other information.

These progress reports are prepared and analyzed every 6 months in all the sanitaria, but the stationary and the traveling skin clinics

are required to submit their reports only once a year, because of the time required in making the examinations. Presentation of the details of these reports, including the evaluation of the results of the treatment, requires a long presentation and will be given in a separate article.

C. EVALUATION OF THE PROBABLE TREND OF LEPROSY

It is not the aim in the following analysis to establish the true trend of leprosy in the following years by the use of correct statistical procedures, utilizing data obtained by repeated intensive surveys. An indication of the general direction of the trend would be quite sufficient for the purpose in mind, which is to guide the implementation of the leprosy control program in future years and to determine whether or not the basic aims are sound, in order that they may be either modified or changed completely.

It has already been indicated that the figures for 1960 are to be considered as the base-line data for future analyses and comparisons, in an effort to establish the direction of this trend as early as possible. In certain portions of the following presentation, the figures for 1959, incomplete as they are in certain respects and barely one year removed from the base-year (1960) data, are used for comparison, mainly to obtain guidance in the manner of utilizing and in interpreting the data which will become available in future years.

As has been said, the mere enumeration of new cases discovered each year does not necessarily indicate the rise or decline of the disease, unless it should be demonstrated that there is a sustained direction of change from year to year, accompanied by other measurable phenomena, and with no significant changes in the case-finding procedures taking place.

Age and sex distribution of new cases.—Table 5 gives sex and age distribution in 5-year periods of the new cases of leprosy discovered in 1960, together with a similar distribution among those discovered 1959.

The mean age for males in 1960 was found to be 34.4 years, and for females 33.3 years, so that there is 1.1 year difference in the average age between the two sexes. For 1959, the corresponding means were 33.8 and 32.8 years respectively. The males discovered in 1960 therefore appeared to be 0.6 years older and the females 0.5 years older than the corresponding average age in 1959. The differences are not significant, the figures for the two years in this respect being practically the same.

The distribution of percentages of the same new cases in 1960, by sex and by quinquennial age groups, as indicated in Figure 2, shows that the highest age peak in both sexes appears in the 20 to 34 age-group, with minor peaks in the older age groups. Incidentally, a small peak occurs in the 45-59 age group for females. If this minor peak appears

TABLE 5.—*Age and sex distribution of new leprosy cases found during 1959 and 1960.*

Age group	1959		1960		Age group	1959		1960	
	Male	Female	Male	Female		Male	Female	Male	Female
0- 4	19	28	21	11	50-54	104	72	119	60
5- 9	108	89	84	85	55-59	116	50	84	41
10-14	140	103	141	102	60-64	78	33	77	52
15-19	191	129	167	108	65-69	32	22	34	26
20-24	272	147	224	120	70-74	32	25	32	17
25-29	216	98	196	89	75-79	20	12	24	7
30-34	171	93	171	64	80-84	13	13	11	8
35-39	144	79	124	60	85-89	5	3	2	2
40-44	112	67	114	52	90-94	0	2	1	1
45-49	119	91	116	87	95+	0	0	1	2
					TOTAL	1,892	1,156	1,743	996

in subsequent years, it might suggest some slight influence of menopause. The percentage distribution by sex and age group of new cases in 1959 shows very similar characteristics to that of 1960.

It is noted, however, that the percentage distribution curves of both years are shown to be skew, and that the arithmetic mean is not a good centering constant for such distribution. Therefore, the medians have been determined, and found to be as follows:

	1960	*1959*
Males	31.1 years	29.0 years
Females	29.0 years	29.2 years

The differences are not significant; so that the figures for the two years are more or less the same in this respect.

This question of the ages among newly-discovered cases is of much interest to leprologists, many of whom have expressed the opinion that during the decline of endemic leprosy there should be a shift of the age to the right, that is, towards the older age periods. On the other hand, with improved case-finding and better coverage, the newly-found cases would be discovered earlier and consequently younger. Theoretically, perhaps, there should be a shift to the left in the earlier years of the program followed by a shift in the opposite direction as the disease begins to decline. These changes may eventually be disclosed in further analyses in the future.

Types of leprosy among new cases.—A discussion of the thorny question of the classification of leprosy is beyond the scope of this paper. The diagnosis and typing of cases under the classification actually in use in the field, as shown in Table 6, is based on clinical and bacteriologic grounds. This classification used is a working one, with minor modifications of the official one at present followed in the Philippines. One of the modifications consists of the separation of the reactional phases of the tuberculoid type so as to facilitate tabulation of "open" cases. Also, the "indeterminate" type has been reestablished, and includes the "simple macular" and the "maculoanesthetic" forms.

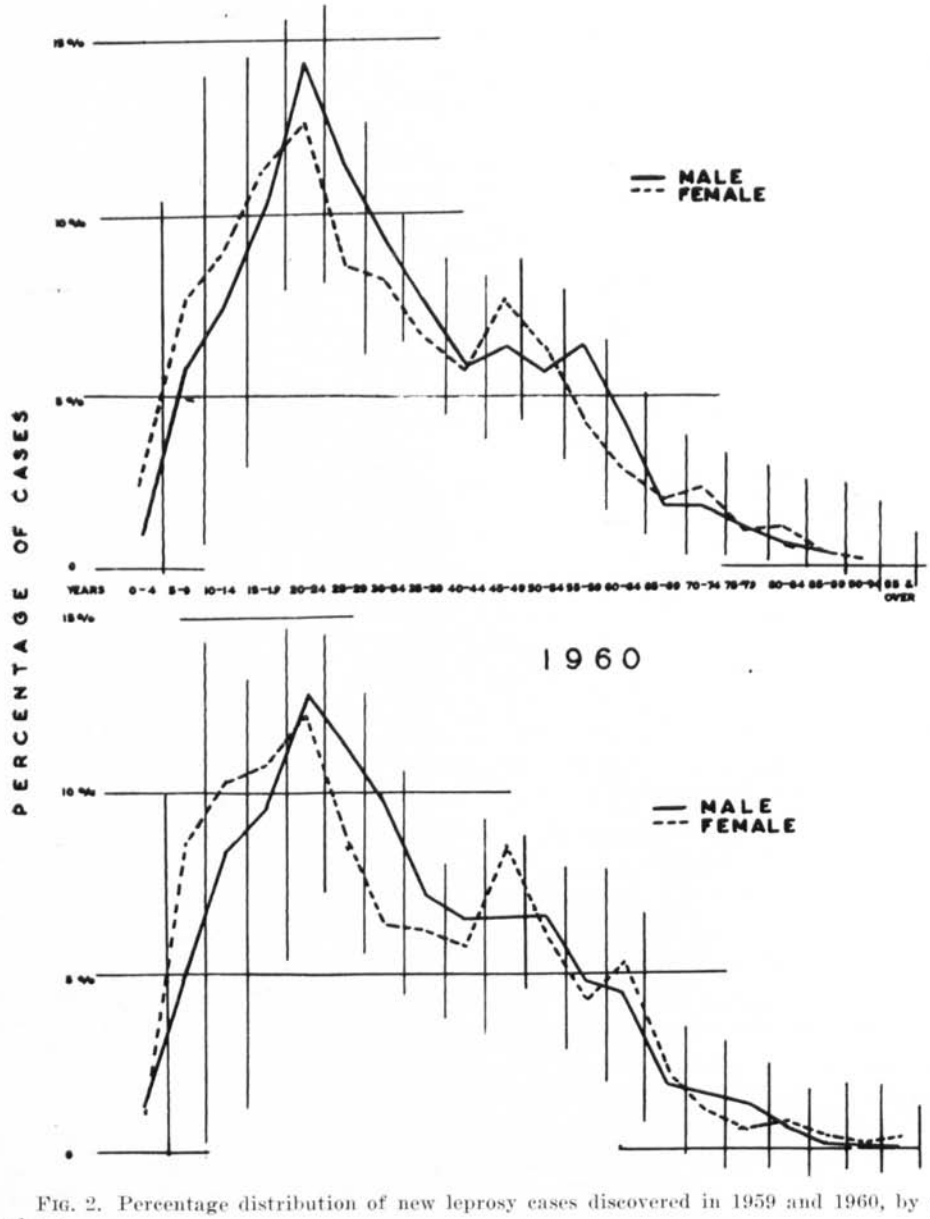

FIG. 2. Percentage distribution of new leprosy cases discovered in 1959 and 1960, by age and sex.

This classification is essentially the same as the primary clinical classification recommended in the First Report of the WHO Expert Committee on Leprosy in 1953 ([12]), except that a primary neural form has been added. Also, the tuberculoid type is subdivided in Table 6 into "torpid" and "reactive" (including reactional) instead of the usual minor, major, and reactional subgroups.

By the simple procedure of adding together all cases classified in

TABLE 6.—*Distribution of the different types and subtypes of leprosy among new cases discovered during 1959 and 1960.*

Type	1959				1960			
1. Lepromatous			1,101	(36.1%)			1,035	(37.8%)
2. Borderline			180	(5.9%)			168	(6.1%)
3. Tuberculoid			1,156	(37.9%)			1,106	(40.4%)
Reactive	419	(13.7%)			406	(14.8%)		
Torpid	737	(24.2%)			700	(25.6%)		
4. Indeterminate			422	(13.8%)			289	(10.6%)
Simple macular	311	(10.2%)			230	(8.4%)		
Maculo-anesthetic	111	(3.6%)			59	(2.2%)		
5. Primary neural			189	(6.2%)			139	(5.1%)
TOTAL			3,048				2,737	

this table as lepromatous, borderline, reactive and reactional tuberculoid, there is obtained the sum total of practically all the open cases, serving as it were as a measure of infectious potential of leprosy in these groups. The separation between the borderline cases and reactive and reactional tuberculoids on one side, and the lepromatous on the other, which distinctions would have to be made in the field, is not particularly important from this point of view.

It is to be seen from Table 6 that open cases totalled to 1,700 out of the 3,048 new cases discovered in 1959, or 56 per cent; and 1,612 out of 2,737, or 58 per cent, in 1960. Such data are available at the end of every month, not only for new cases discovered by each unit appearing in Table 1, but also for each town in the endemic areas covered, thereby pinpointing the danger zones.

Some comment is needed with regard to the "simple macular" and the "maculoanesthetic" forms in Table 6. The term simple macular is limited to the subtype similarly named in the Cairo Classification, characterized by hypopigmented macules which comply strictly with the dermatologic definition of macule (namely, circumscribed, nonelevated alteration in the color of the skin) and histologically by perivascular round cell infiltration, with or without some epithelioid cells.

In the maculoanesthetic form the initial simple macular lesions have persisted—usually this form shows more numerous macules and more marked nervous disturbances than the simple macular—or are known to have existed previously and are now accompanied by anesthesia of polyneuritic distribution, with or without muscular paralyses or atrophy, and/or trophic disturbances. While it can be said, therefore, that the maculoanesthetic is essentially a more advanced, more developed stage of the simple macular, it must be remembered that some of the latter also develop into lepromatous, tuberculoid, and probably even borderline lesions, although on the other hand many simple macular lesions simply disappear without trace.

The percentage distribution of the nine different types and forms and their combinations among the new cases discovered in 1959 and 1960, separately, is given in Table 6. Figure 3 was prepared to indicate better if there were any differences in the relative distribution of the 2 main types and 3 combined forms in the two successive years. For 1960, if the lepromatous and borderline cases are added together, they constituted 43.9 per cent of the total; 40.4 per cent were tuberculoid

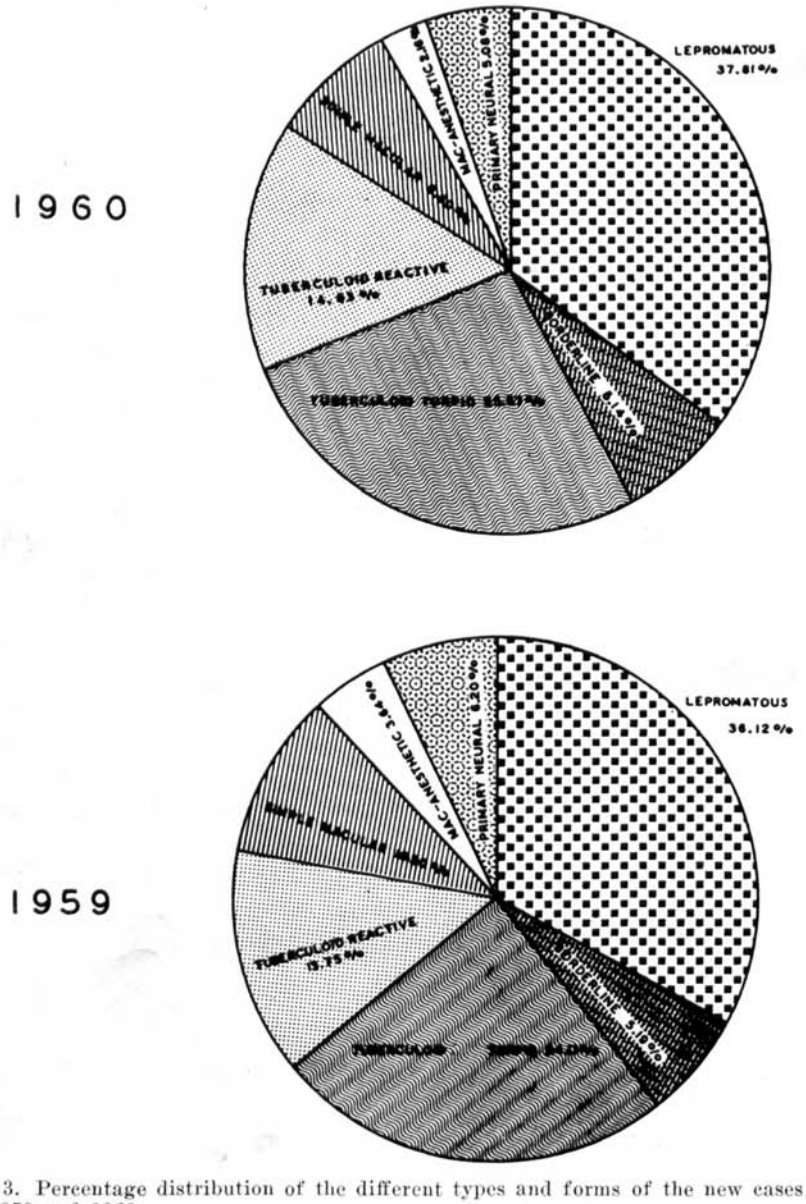

FIG. 3. Percentage distribution of the different types and forms of the new cases discovered in 1959 and 1960.

cases (25.6% torpid and 14.8% both reactive and reactional); 10.6 per cent represented the indeterminate cases (8.4% simple macular and 2.2% maculoanesthetic); and 5.1 per cent were primary neural. The distribution is more or less similar to the type distribution found in intensive spot field surveys done in the Philippines.

Figure 3 indicates that no significant differences have been found in type distribution in 1959 and 1960. There were some slight relative increases in the two polar types, lepromatous and tuberculoid, compensated by even more marked decreases in the indeterminate and primary neural types. These changes are probably accidental; it is only when such shifts continue in the same direction for a number of years that their significance may become apparent.

The matter of the observed downward trend of the lepromatous type concomitant with an upward swing of the tuberculoid type in the towns of Talisay and Cordova, Cebu Province, has been mentioned. While the actual statistics were first published by Guinto *et al.* ([4]) in 1954, this shift had already been noted as far back as 20 years previously, and yet no serious implications have been observed so far indicating that the leprosy prevalence in Cebu is worsening, as some leprologists fear would be the case. On the other hand, this apparent shift in Cebu is probably at least partly due to the efforts to promote early voluntary presentation of cases. Or, may it not also be due partially to increasing resistance of the population to the disease which now shows a tendency to develop milder forms of leprosy?

Age distribution of the different types and subtypes among new cases discovered in 1960.—With the expectation that shifts in the age distribution of the different types and subtypes among the new cases may be detected earlier if the data are further analyzed by age groups, Table 7 for the year 1960 has been prepared. (A similar table was also prepared for 1959 in order that a trial comparison may be made as will be done yearly hereafter, but lack of space does not permit its inclusion in this report.)

Since it is obvious that the median is a better centering constant than the mean in the age distribution of this series, as the ages do not follow a chance variation but tend instead to group in a skew distribution where the ages show a more representative value of the age group in the different types and forms, both are given at the bottom of Table 7 separately for 1959 and 1960.

Patients with simple macular leprosy constituted the youngest group, with median ages of 13.3 years in 1959 and 15.3 in 1960. No clear distinctions are observed in the median ages of the other types, but the primary neural cases are among the oldest.

Since the average or mean age among patients suffering from different types may give a wrong impression of the age distribution, the percentage distribution of the different types and forms in 5-years age

TABLE 7.—*Age distribution of the different types and subtypes among new leprosy cases found in 1960 (males and females combined).*

Age (years)	Lepromatous		Tuberculoid reactive		Tuberculoid torpid		Simple macular		Maculo-anesthetic		Primary neural		Borderline		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0- 4	2	0.2	3	0.7	17	2.4	9	3.9	—	—	—	—	1	0.6	32	1.2
5- 9	22	2.1	19	4.7	65	9.3	53	25.0	1	1.7	—	—	9	5.4	169	6.2
10-14	80	7.7	36	8.9	52	7.4	51	22.2	4	6.8	6	4.3	14	8.3	243	8.9
15-19	113	10.9	32	7.9	66	9.4	25	10.9	11	18.6	14	10.1	14	8.3	275	10.0
20-24	114	13.9	50	12.3	72	10.3	22	9.6	12	20.3	15	10.8	29	17.3	344	12.6
25-29	131	12.7	32	7.9	62	8.9	9	3.9	8	13.6	16	11.5	27	16.1	285	10.4
30-34	117	11.3	29	7.1	48	6.9	10	4.3	3	5.1	12	8.6	16	9.5	235	8.6
35-39	65	6.3	35	8.6	47	6.7	10	4.3	2	3.4	17	12.2	8	4.8	184	6.7
40-44	67	6.5	32	7.7	36	5.1	9	3.9	4	6.8	7	5.0	11	6.5	166	6.1
45-49	68	6.6	33	8.1	63	9.0	11	4.8	5	8.5	13	9.3	10	5.9	203	7.4
50-54	70	6.8	32	7.9	49	7.0	7	3.0	4	6.8	11	7.9	6	3.6	179	6.5
55-59	40	3.9	26	6.4	38	5.4	3	1.3	1	1.7	7	5.0	10	5.9	125	4.6
60-64	57	5.5	13	8.2	39	5.6	6	2.6	—	—	8	5.8	6	3.6	129	4.7
65-69	16	1.5	11	2.7	21	3.0	5	2.2	1	2.2	3	2.2	3	1.8	60	2.2
70-74	20	1.9	11	2.7	9	1.3	—	—	2	3.4	4	2.9	3	1.8	49	1.8
75-79	13	1.3	8	2.0	7	1.0	—	—	—	—	3	2.2	—	—	31	1.1
80-84	7	0.7	—	—	8	1.1	—	—	1	1.7	2	1.4	1	0.6	19	0.7
85-89	—	—	3	0.7	—	—	—	—	—	—	1	0.7	—	—	4	0.1
90-94	2	0.2	—	—	—	—	—	—	—	—	—	—	—	—	2	0.1
95+	1	0.1	1	0.2	1	0.1	—	—	—	—	—	—	—	—	3	0.1
TOTAL	1,035	100.0	406	100.0	700	100.0	230	100.0	59	100.0	139	100.0	168	100.0	2,737	100.0
A. Mean 1960	35.0 yrs		36.6 yrs		34.4 yrs		22.2 yrs		31.8 yrs		39.6 yrs		30.5 yrs			
Mean 1959	34.7 "		30.9 "		37.5 "		19.6 "		32.5 "		37.5 "		34.5 "			
B. Median 1960	31 yrs		35.2 yrs		31.6 yrs		15.3 yrs		25.6 yrs		36.8 yrs		28.1 yrs			
Median 1959	30.2 "		26.8 "		35.4 "		13.3 "		30.8 "		33.6 "		31.4 "			

groups, as given in Table 7, was studied by means of graphs for the year 1960. Three graphs (Figs. 4A to 4C) are used for clarity; to present 7 lines in a single graph would be confusing.

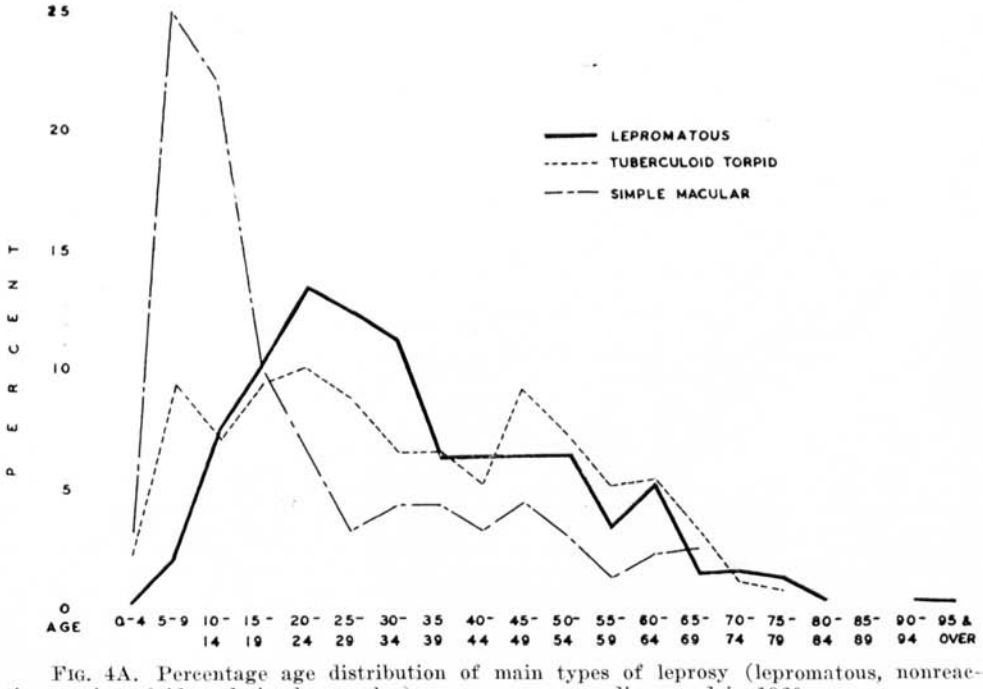

FIG. 4A. Percentage age distribution of main types of leprosy (lepromatous, nonreactional tuberculoid, and simple macular) among new cases discovered in 1960.

Figure 4A shows that the 3 principal types presented distinctively different patterns of age distribution. The simple macular curve reaches its peak at the age 5-9 (children) while the lepromatous type peaks at the age 20-24 (young adults). The torpid tuberculoid type, although it also seems to reach its peak at the same 20-24 age group, yet does not rise as high as the lepromatous type and this is preceded by a primary peaking at the 5-9 age group. The simple macular pattern shows an abrupt fall while the lepromatous type has a more gradual decline; all of them, particularly the torpid tuberculoid, present more or less a straggling appearance as the age advances. The incidence among the older age groups of each type tends to become negligible; this may be due to the waning population in the later stages of life.

With regard to the reactive tuberculoid subtype and the borderline group, Figure 4B shows that the latter presents a curve closest to that of the lepromatous while the reactive tuberculoid is almost like that of torpid tuberculoid except that it reaches a relatively higher peak at the same 20-24 age group. Both show a gradual decline; but at the same time the two present a rugged plateau although the tuberculoid type

begins plateauing at an earlier age (25-29 years) while the borderline type starts at 35-39 years.

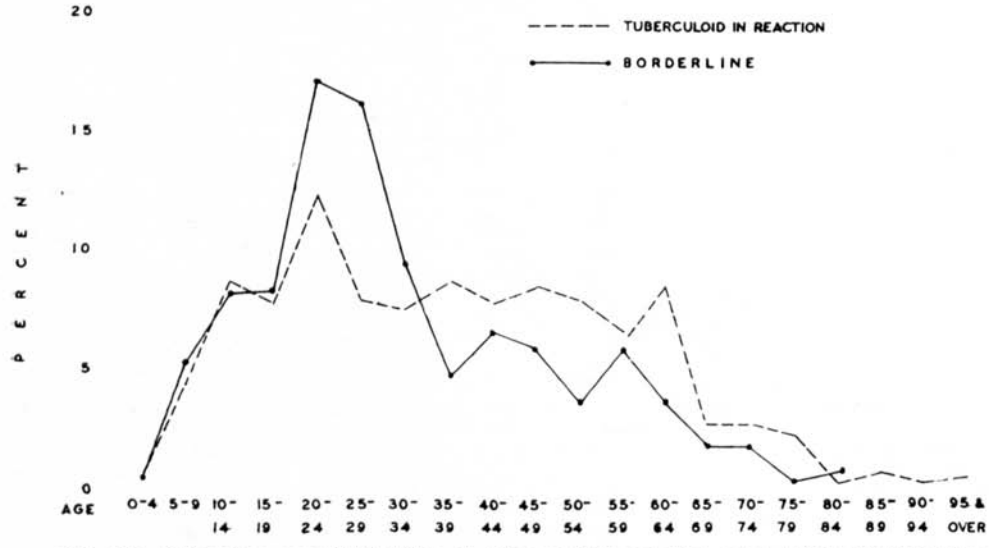

FIG. 4B. Percentage age distribution of tuberculoid-in-reaction cases and borderline cases in 1960.

In Figure 4C, it is seen that the maculoanesthetic curve seems to be a cross between the simple macular and the lepromatous types, reaching its peak at the age group 20-24 years, but presents a more straggling appearance as the age advances, with a distinct secondary peaking at age 45-49. The primary neural curve approaches that of the tuberculoid torpid type, but with its peak in the 35-39 age group. It will be interesting to observe in later years whether any persistent changes in the configuration of these curves will be demonstrated in subsequent analyses.

Since the prevalence of leprosy is lower in females than males in the Philippines, similar tables and figures on age distribution of the different types and subtypes by sex have been prepared and studied, but are not used here. No significant differences between the two sexes were noted for 1960.

It is not expected that the yearly analysis of any one particular attribute or characteristic feature of the new cases as regards the distribution of sex and age, or duration of the disease, or the relative proportion of the different types, will be sufficient to give a definite clue to the general direction of the trend of leprosy. Rather, the results of the individual analyses will have to be considered collectively, together with a careful study of the movement of patients on the active list.

Finally, plans have been developed by means of which the trend of leprosy may be confirmed in the future by means of small intensive spot

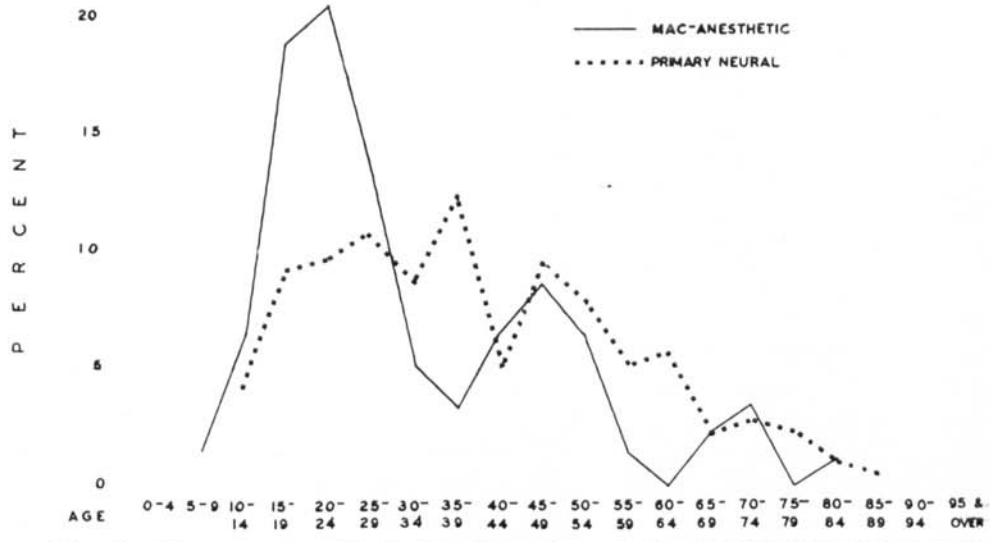

FIG. 4C. Percentage age distribution of maculoanesthetic and primary neural cases in 1960.

surveys to be conducted by the traveling skin clinics after they have completed the rapid-type surveys in the territories assigned to them.

SUMMARY

In the final analysis, the effectiveness of a leprosy control program should be measured by its effect or impact on the prevalence of the disease. A successful program should eventually lead to, or at least be associated with, a downward trend of leprosy.

The true trend is best determined by securing accurate incidence and prevalence rates by means of intensive surveys, which require examination for leprosy of at least 99 per cent of the population. Such surveys would have to be repeated at proper intervals of years in order that the trend might be plotted. This procedure, which has been accomplished so far only in two localized areas with a limited population, is too time-consuming and expensive to use when an entire country has to be covered. It is probable that, if a dependable diagnostic test were available, it would be possible to secure reasonably accurate incidence and prevalence rates by means of well-selected sample surveys.

This article describes past efforts to find some other substitute method which, although not very accurate, nevertheless would be adequate to serve as a basis for the evaluation of a nation-wide leprosy control program. Base-line data are shown and discussed, and methods are proposed as to how the necessary information may be made available in the future. It is hoped that at least an indication of the direction of the general trend may be revealed after some years by the use of these procedures.

In the meantime, evaluation of other phases of the program, such as case-finding and treatment, are being undertaken with the expectation that the accomplishments of the program may thus be adequately assessed.

The Philippine leprosy control program is therefore at present being evaluated along three lines, namely: (1) evaluation of the case-finding methods employed; (2) evaluation of the results of the treatment; and (3) evaluation of the direction of the trend of leprosy.

It was found to be simple and comparatively easy to plan for the assessment of the case-finding; the main problem to be solved was to maintain the accuracy of the data obtained from the field. Likewise, the evaluation of the results of treatment was found to be adequate, after the requirement for periodical clinical and bacteriologic examinations of cases with active lesions was instituted. On the other hand, the evaluation of the trend of leprosy continues to present difficult problems, if statistical standards are to be maintained. The procedures suggested in this article are expected to furnish clues which, however, will have to be checked by spot surveys of the intensive type in the future.

A method requiring the maintenance of a registry of patients with active lesions of the disease, together with a record of the movement of patients in this registry, has been found to be a useful device for securing data for a general assessment of case-finding, treatment, and the probable trend of the disease. However, additional data have been collected by other means which permit a more complete evaluation of each of these phases of the program.

Data utilized in the process of evaluation were obtained from the reports of field units; good evaluation is based on good reports.

All leprosy control programs, however small, should endeavor to collect information necessary for assessment of its own accomplishments. In fact, such programs should be provided with, as it were, built-in facilities for self-evaluation. This step will be found useful, not only in detecting the weaknesses as well as the strong points of the program, but particularly in preparing plans for its future development and expansion.

RESUMEN

En el análisis definitivo, hay que medir la eficacia de un plan de lucha antileprosa por su efecto o embate sobre la frecuencia de la enfermedad. Un plan satisfactorio debe con el tiempo conducir a, o a lo menos vincularse con, una tendencia descendente de la lepra.

Se determina mejor la verdadera tendencia obteniendo las tasas exactas de incidencia y frecuencia por medio de minuciosas encuestas, que requieren el examen en busca de lepra de 99 por ciento a lo menos de la población. A fin de poder delinear la tendencia, habría que repetir las encuestas a plazos apropiados de años. Este procedimiento, que hasta ahora no ha sido llevado a cabo más que en dos zonas localizados de población limitada, resulta demasiado largo y costoso cuandeo hay que abarcar un país entero. Es

probable que, si se contara con una prueba fidedigna de diagnóstico, sería posible obtener tasas bastante exactas de incidencia y frecuencia por medio de encuestas representativas bien escogidas.

Describe este trabajo los esfuerzos realizados en el pasado para encontrar algún otro método substitutivo, el cual, aunque no muy exacto, sería, sin embargo, adecuado para servir de base para la justipreciación de un plan nacional de lucha antileprosa. Se muestran y discuten datos de la línea de base, proponiéndose métodos relativos a la manera en que podría acopiarse la información necesaria en el futuro. Espérase que, con el uso de estos procedimientos, al cabo de algunos años se descubra a lo menos alguna indicación de la dirección de la tendencia general.

Entre tanto, se va emprendiendo la justipreciación de otras fases del plan, tales como el descubrimiento de casos y tratamiento, con la esperanza de que puedan así avaluarse adecuadamente las realizaciones del plan.

El plan filipino de lucha antileprosa se halla, pues, actualmente en vías de justipreciación en tres sentidos; a saber: (1) justipreciación de los métodos empleados para el descubrimiento de casos; (2) justipreciación de los resultados del tratamiento; y (3) justipreciación de la dirección que sigue la tendencia de la lepra.

Se observó que era sencillo y comparativamente fácil atender a la valoración de los resultados del descubrimiento de casos; el problema principal por resolver era mantener la exactitud de los datos procedentes del territorio abarcado. Así también. resultó adecuada la justipreciación de los resultados terapéuticos una vez puesto en efecto el requisito de los exámenes clínicos y bacteriológicos periódicos en los casos con lesiones activas. En cambio, la justipreciación de la tendencia de la lepra continúa planteando problemas difíciles, si van a mantenerse las pautas estadísticas. Es de esperar que los procedimientoes sugeridos en este trabajo aporten claves que, que, a pesar de todo, tendrán que comprobarse con encuestas concentradas de índole intensa en el futuro.

Un método que requiere el mantenimiento de un registro de los enfermos con lesiones activas de la dolencia, junto con una apuntación de los movimientos de los enfermos inscritos en el registro, ha resultado ser un procedimiento útil para conseguir los datos para una justipreciación general del descubrimiento de casos, tratamiento y probable tendencia de la enfermedad. No obstante, se han colectado datos adiciona es por otros medios que permiten una valuación más completa de estas fases del plan.

Los datos utilizados en el procedimiento de valuación fueron ontenidos de los informes de las unidades de campaña; una puena valuación se basa en buenos informes.

Todos los planes de lucha antileprosa, por pequeños que sean, deben tratar de colectar la información necesaria para la justipreciación de sus propias realizaciones. Es más, esos planes deben poseer, por decirlo así, como parte indispensable de su estructura, medios de auto-valuación. Esta providencia resultará útil, no tan sólo para descubrir los puntos vulnerables e igualmente las partes valiosas del plan, sino más en particular para elaborar proyectos para su desenvolvimiento y expansión en el futuro.

RESUMÉ

Lors de l'evaluation finale, l'efficacité d'un programme de contrôle de la lèpre doit être mesuré d'après son effet sur la prévalence de la maladie. Un programme réussi doit en fait mener à, ou tout au moins être accompagné d'une réduction de la lèpre.

La courbe réelle est le mieux déterminée en fonction des taux d'incidence et de prévalence obtenus de manière précise lors d'enquêtes approfondies. De telles enquêtes supposent qu'au moins 99% de la population soit examinée au point de vue lèpre, et ceci périodiquement à plusieurs années d'intervalle afin que le tracé de la courbe puisse être dessiné. Cette méthode n'a jusqu'à present été appliquée que dans deux régiones bien délimitées, sur une population d'effectifs restreints; elle exige trop de

temps et est trop coûteuse que pour être utilisée lorsqu'il s'agit de couvrir un pays dans son entièreté. Il est probable que si l'on disposait d'un test diagnostique fidèle, il pourrait être possible d'obtenir des taux de prévalence et d'incidence raisonnablement précis par des enquêtes portant sur des échantillons bien selectionnés.

Cet article décrit les efforts déployés dans le passé pour trouver une méthode de substitution qui, malgré une certaine imprécision, pourrait toutefois servir de base pour l'évaluation d'une programme anti-lépreux national. Les principes fondamentaux sont décrits et discutés, et des méthodes sont proposées, qui seraient susceptibles de fournir à l'avenir les informations nécessaires. Il est permis d'espérer que l'emploi de ces procédés permettra au moins de fournir, en quelques années, une indication quant à l'allure génerale de la courbe.

Entre temps, l'evaluation des autres phases du programme, dépistage et traitement par exemple, est sur le point d'être enterprise, et l'on s'attend à ce que les réalisations puissent être appréciées de manière adéquate.

Le programme de contrôle de la lèpre aux Philippines est donc évalué à présent de trois façons, à savoir: 1) évaluation des méthodes de dépistage qui sont utilisées; 2) évaluation des résultats du traitement; 3) évaluation de l'allure de la courbe de l'endémie lépreuse.

Il a été constaté que l'évaluation du dépistage est simple et relativement facile à régler; le problème important qui reste à résoudre est le maintien d'un même niveau de précision parmi les données obtenues sur le terrain. De même, l'evaluation des résultats thérapeutiques a été considérée comme valable, lorsqu'on eût prescrit des examens cliniques et bactériologiques périodiques chez les malades présentant des lésions actives de lèpre. Par ailleurs, l'evaluation de la courbe de l'endémie continue à poser des problèmes difficiles, si l'on veut se conformer à des critères statistiques. On s'attend à ce que les méthodes suggérées dans cet article fournissent l'outil nécessaire qui, toutefois, aura plus tard à faire ses preuves sur le terrain au cours d'enquêtes approfondies.

La tenue d'un registre se rapportant aux malades avec lésions actives, et aussi la mise à jour de ce registre, sont des méthodes qui ont été trouvées utiles pour fournir des données se rapportant à une appréciation générale du dépistage, du traitement, et de l'allure probable de la maladie. Cependant, des informations supplémentaires ont été réunies par d'autres moyens, et permettent une évaluation plus complète de chacune des phases de ce programme.

Les données utilisées ont été obtenues à partir des rapports fournis par les unités travaillant sur le terrain; une bonne évaluation est basée sur de bons rapports.

Tous les programmes de contrôle de la lèpre, même s'ils sont de petite envergure, devraient prendre la peine de réunir les informations nécessaires pour évaluer leurs propres réalisations. En fait, de telles méthodes permettant l'evalution devraient être prévues et faire partie intégrale de ces programmes.. Cette mesure sera utile, non seulement pour détecter les faiblesses du programme comme ses mérites, mais surtout pour préparer les plans en vue de son futur développement et de son expansion.

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