Public Health Reports

Vol. 63 • **NOVEMBER 19, 1948** • *No. 47*

Chronic Illness and Socio-Economic Status

By P. S. LAWRENCE, *Chief of Familial Studies Section, Public Health Service*[1]

An illness survey was conducted in Hagerstown, Md., in 1943 on white families that had been subjects of a comprehensive study during a 3-year period from 1921 to 1924. The resurvey was undertaken to furnish information on the relationship between health status, familial and socio-economic characteristics recorded in 1921–24, and the subsequent record of sickness and mortality. This report presents data on chronic diseases in families and in individuals, in relation to economic status at the time of each survey, and change in status during the 20-year span.

Material

The basic material used in this paper has been described by Ciocco (*1*). Of 1,822 families which participated in the original survey, contact was made with one or more members of 1,628 families in 1943. The present data do not include families which were untraced in 1943. The following are also excluded from this report: (*a*) Families in which ages were unknown or unrecorded; (*b*) families which were "broken" in 1923 through death or separation of husband or wife, or which were not true families, but only groups of persons with no definite household head; (*c*) families which were observed for less than 12 months in the original survey.

Excluding these groups leaves 1,310 families that were under observation for 12–36 months in 1921–24 and consisted of husband, wife, and children, all of known ages.

The 1943 survey revealed that 228 of these 1,310 families were no longer intact—either both parents were dead or information on a surviving parent could not be obtained. These families are necessarily excluded from the tabulations which are based on knowledge of

[1] From the Division of Public Health Methods, Hagerstown, Md.

socio-economic status of the family in 1943. Among the remaining 1,082 families, there were 72 in which one of the parents had died of a nonchronic disease during the 20-year period. Since any conclusions regarding interrelationships between chronic illness and socio-economic status might be biased by the inclusion of persons who died from nonchronic causes, the 72 families in which such deaths had occurred are excluded from the tables which are based upon the resurvey data.[2] In substance, in 1943 there were 1,010 families of known socio-economic status which were unaffected by death from nonchronic causes and in which at least one of the parents was alive.

Evaluation of socio-economic status—When the preliminary canvass was made in Hagerstown in the autumn of 1921, each household was classified according to economic status. The classification was discussed and checked by members of the statistical staff, who personally visited the households.

As stated by Sydenstricker, the families were roughly classified into five categories, "well-to-do," "comfortable," "moderate," "poor," and "very poor." Since the range of income included the richest as well as the poorest families in town, the classification was deemed accurate enough for broad distinctions (*2*). At the same time, other observations were made which further defined and described the categories used. These findings included data on persons per room, sanitary conditions, type of excreta disposal, and general type and amount of milk supply.

The following tabulation shows the percentage of households in each economic group in the total 1923-survey populations reported upon by Sydenstricker. The corresponding figures for the 1,310 families included in this study reveal that selection of complete families has not affected the distribution of families by economic status.

Socio-economic status	Total 1923 survey population	1,310 selected families, 1923	1,010 families, 1943
Well-to-do	2.0	2.1	4.7
Comfortable	10.1	8.9	12.2
Moderate	47.3	47.5	62.9
Poor	38.0	37.7	19.1
Very poor	2.7	3.9	1.2

[2] The 72 families excluded because of deaths from nonchronic causes differ only slightly from the included families. There were 45.8 percent of the 72 excluded families and 41.6 percent of the 1,310 included families in the "poor" and "very poor" economic groups in 1923. Similarly, 25 percent of the excluded families and 21.3 percent of the included families were in these two economic groups in 1943. No appreciable differences in age composition exist. Chronic illness was present in 1923 in 52.8 percent of the excluded families and in 55.0 percent of the included families.

In evaluating economic status in 1943 the families were classified according to the same categories used in the earlier survey. Elements in the evaluation were location, conditions, and taxable value of the dwelling and place and type of employment. Actual family income was not obtained. It appears from the above tabulation that, with due regard for differences in judgment in assigning socio-economic ratings during the two surveys, these families were in better socio-economic circumstances in 1943 than they were in 1923. This change is probably a reflection not only of a general improvement in economic circumstances throughout the community, but also of an improvement in this specific sample due to the aging of the group and employment of children still residing in the household.

Change in economic status from 1923 to 1943 was recorded only in three categories, "improved," "same," and "reduced." These changes are not solely dependent upon the differences between economic ratings of 1923 and 1943, but were recorded independently when the family was visited in the second survey. The interviewer had the original data at hand and based the conclusion upon a comparison between the conditions previously recorded and those observed. Fine distinctions were of course impossible, hence an improved or reduced classification represents a gross change, and a considerable range of changes is actually embodied within the classification "same." Out of 1,010 families, 14.5 percent were recorded as having an improved status, 80.9 the same, and 4.6 reduced.

Chronic illness—During the 1923 survey interviewers visited each household at intervals of 6 weeks to 2 months, obtaining records of illness during the interval. To assure complete reporting of cases of chronic disease, this paper includes only families observed for 12 months or longer. If no one in the family was recorded as having had an attack of chronic illness during the entire period of observation, that family or person is considered in this paper as having been free of chronic illness in 1923.

Illnesses in the 1943 canvass were recorded by cause of illness according to the knowledge of the respondent and were classified as chronic on the basis of the nature of the disease in the same manner as in the 1921–24 survey. The terms "ill" or "well" are used in the text and tables of this paper to mean with or without *chronic* disease. Causes of chronic illness are listed by broad groupings in the second report based on these data (*3*). For persons who died or were interred in Washington County, information as to date and cause of death was verified by death certificates.

Chronic Illness and Socio-Economic Status in Families

Prevalence of chronic illness—Table 1 shows, according to economic class in the 1921–24 survey, the number and percentage of families in which one or more persons had an attack of chronic illness while under observation. The crude rates show an increase in prevalence from 33.3 percent for the highest economic class to 66.7 percent for the lowest. This table also shows the expected percentage ill and the rates adjusted for age and family size. In this and subsequent tables concerning families (except table 5), the "expected" percentages ill

TABLE 1. *Prevalence of chronic illness in families, according to socio-economic status. 1923*

Socio-economic status	Number			Percent ill		
	Total	Well	Ill	Observed	Expected[1]	Adjusted[2]
Total	1,310	590	720	55.0	55.0	55.0
Well-to-do	27	18	9	33.3	56.6	27.7
Comfortable	116	63	53	45.7	56.8	47.3
Moderate	622	280	342	55.0	54.7	55.0
Poor	494	212	282	57.1	54.7	57.7
Very poor	51	17	34	66.7	56.3	61.3

[1] Rates that would prevail if chronic illness and socio-economic status were unassociated.
[2] Rates that would prevail if there were no age or family-size differences in the groups considered.

are obtained by applying the age and family-size specific rates for the total population of the sample to the age and family-size distribution within each socio-economic class. The "expected" numbers of families with chronic illness thus obtained are summed within each class and divided by the appropriate total. The resulting "expected" rates of this paper are, therefore, the percentage ill that would be expected if chronic illness and the socio-economic characteristic were unrelated. In computing the adjusted rates shown in the final columns, the age of father and family-size distribution of the total population of the sample is used as the standard.[3] The adjusted rates, or percentages, are the figures that would prevail if there were no age or family-size differences among the socio-economic groups considered.

In table 1, the observed increase in prevalence of chronic disease with successively poorer economic status is statistically significant. When the differences between the observed rates and the expected rates are examined by means of a chi-square test, it is found that differences as great as these could have arisen by chance alone less than one time in 100 population samples of the same size as the one in this table. Since a probability of chance occurrence of less than 0.01

[3] Throughout this report the age and family size or age and sex adjustments have been made according to the direct method described by Pearl (4) as "adjusted death-rates (B)."

is very small, it is assumed that the differences between the observed and expected figures are true differences resulting from variations in socio-economic status.

The relationship observed for 1923 also holds true in 1943, as may be seen in table 2. In the higher socio-economic categories the observed prevalence rates are less than the expected, while in the poorer categories the rates are higher than expected. These differences yield a probability of chance occurrence of 0.06. Although a probability of 0.05 or less is a usual criterion for statistical significance, supporting data from other studies indicate that the relationship

TABLE 2. *Prevalence of chronic illness in families, according to socio-economic status, 1943*

Socio-economic status	Number			Percent ill		
	Total	Well	Ill	Observed	Expected [1]	Adjusted [2]
Total	1,010	585	425	42.1	42.1	42.1
Well-to-do	47	32	15	31.9	44.2	29.3
Comfortable	123	74	49	39.8	44.6	39.8
Moderate	635	374	261	41.1	41.8	41.1
Poor	193	99	94	48.7	41.0	50.6
Very poor	12	6	6	50.0	41.9	44.0

[1] Rates that would prevail if chronic illness and socio-economic status were unassociated.
[2] Rates that would prevail if there were no age or family-size differences in the groups considered.

observed in this table is real. It should be noted that the family prevalence rates of table 2 are useful for comparisons among socio-economic classes in this sample, but are not representative of the rates that would be obtained for the population in general. This sample is composed of families in which, by 1943, there had been a considerable reduction in family size, a large proportion had only one surviving parent, and all persons were over 20 years of age.

The relationship between chronic illness and economic status has been previously shown. Bigelow and Lombard demonstrated this association in their Massachusetts study (*5*). In a 1931 survey of persons over 40 years of age, those in "comfortable" circumstances had a chronic illness rate of 255 per 1,000; in "high moderate," 270; in "low moderate," 305; and among the "poor," 412. For persons on relief the rate was 514 per 1,000. There was chronic illness in 62.3 percent of the *families* on relief. Figures based upon the National Health Survey, 1935–36, revealed that the percentage of disability from chronic disease on the day of visit was 4.8 for persons on relief, 2.7 for persons not on relief but with family incomes of less than $1,000, and 1.8 for persons with family incomes of $1,000 to $1,500 (*6*). Another National Health Survey report showed that the frequency of chronic disease disability lasting a week or longer during a 12-month period was almost twice as high for members of relief families as

among those in better economic circumstances; for other persons with family incomes of less than $1,000 the frequency was one and one-half times as high as among those in better economic circumstances (7).

Although there is little doubt as to the inverse relationship between socio-economic status and the prevalence of chronic illness, the static nature of data from a single survey precludes estimation of the extent to which low socio-economic circumstances may cause, or result from, chronic disease. It is hoped that by a new approach, introduction of the time element, information may be furnished concerning the dynamics of the observed association.

Table 3 reveals that one or more persons had chronic illness in 1943, or had died from chronic disease between 1923 and 1943, in 91.5 percent of the families that had a reduction in socio-economic status between the two surveys. The rate was 64.1 percent for families whose status remained the same and 45.2 for those with improved status. Adjustment for age and family size does not alter substantially the crude figures. When compared with the expected figures, the observed percentages are found to differ by a statistically significant amount, the value of P being less than .01. The marked difference between the reduced and improved categories demonstrates the dynamic nature of the chronic disease problem.

TABLE 3. *Proportion of families in which one or more persons were ill or dead from chronic disease in 1943, according to change in socio-economic status, 1923–43*

Change in socio-economic status, 1923–43	Number, 1943			Percent ill or dead, 1943		
	Total	Well	Ill or dead	Observed	Expected [1]	Adjusted [2]
Total	1,010	377	633	62.7	62.7	62.7
Reduced	47	4	43	91.5	64.0	87.2
Same	817	293	524	64.1	63.2	63.6
Improved	146	80	66	45.2	59.5	44.2

[1] Rates that would prevail if chronic illness and socio-economic status were unassociated.
[2] Rates that would prevail if there were no age or family-size differences in the groups considered.

Socio-economic status as a factor affecting chronic illness—In order to clarify the relationship between socio-economic status and the subsequent record of chronic illness, table 4 presents data on families which were free of chronic disease during the 1921–24 survey and had the same socio-economic status in 1943 as in 1923. The attempt is thus made to reduce the possibility that modification of chronic disease incidence may have resulted primarily from an improved or reduced economic status subsequent to the 1923 observations. Even so, this factor may not be entirely eliminated. As previously stated, the category "same" includes all except gross changes in socio-economic status. Furthermore, a family may, for example, have had a change

TABLE 4. *Proportion of families in which one or more persons were ill or dead from chronic disease in 1943 among families which were free of chronic disease in 1923, according to socio-economic status in 1923*

Socio-economic status, 1923	Number, 1943			Percent ill or dead, 1943		
	Total	Well	Ill or dead	Observed	Expected [1]	Adjusted [2]
Total	431	159	272	63.1	63.1	63.1
Well-to-do	13	4	9	69.2	69.9	56.4
Comfortable	55	19	36	65.5	68.1	59.5
Moderate	224	88	136	60.7	63.1	62.4
Poor	132	45	87	65.9	60.1	68.6
Very poor	7	3	4	57.1	70.3	30.2

[1] Rates that would prevail if chronic illness and socio-economic status were unassociated.
[2] Rates that would prevail if there were no age or family-size differences in the groups considered.

in status shortly after the 1923 survey and reverted to approximately the same status shortly before the 1943 canvass. The data do not give a record of changes during the 20-year period.

This lack of interim data is true also of chronic illnesses. It is quite possible that a person who was well in 1923 could have developed a chronic ailment during the interval, and yet by 1943 have recovered, become accustomed to the disability, or otherwise felt so well that he did not report any ailment. Such conditions may have occurred to approximately the same degree within the several socio-economic groups of 1923, and hence should result in an over-all error, rather than a bias in favor of any particular economic class. However, it is well to keep in mind these limitations of the data. Table 4 includes families in which one or both parents, though well in 1923, had died of chronic disease by 1943. The dead must be included if the effect of socio-economic status on the occurrence of chronic illness is to be evaluated properly.

Although possibly containing some error due to lack of interim data, by and large table 4 presents the incidence or rate of appearance of new cases of chronic illness from 1923 to 1943 according to socio-economic status of the family. With due consideration for differences in age, family size, and the size of the sample, differences in the proportions of families which developed chronic illness should be indicative of the effects of differences in socio-economic status.

Rates in table 4 adjusted for age and family size show an upward trend from an incidence of 56.4 percent for the well-to-do to 68.6 percent for the poor. This association may also be seen in the differences between the observed and expected figures. However, these differences are not large and are of an order which yields a probability of chance occurrence of about 0.55. Because of the small number of cases in the "very poor" category, no significance can be attached to the figures in this group. Combining very poor with poor yields the

same probability of chance occurrence. It is apparent that the association found in this table is not of as high an order as is found in the preceding tables, and that, judging from this sample, socio-economic status in itself does not seem to play an important part in the chances of developing chronic disease.

Chronic illness in the family as a factor in changed socio-economic status—The percentage of families which had a reduced, unchanged, or improved status is shown in table 5 according to history of chronic illness in 1923 and in 1943. Families in which there was a death from chronic disease during the interval are included. None of the families

TABLE 5. *Proportion of families in each category of change in socio-economic status, according to history of chronic illness in 1923 and 1943*

Change in socio-economic status	A			B				C				D			
	Well in 1923; well in 1943			Well in 1923; illness or death 1943				Ill in 1923; well in 1943				Ill in 1923; illness or death 1943			
	Number	Percent		Number	Percent			Number	Percent			Number	Percent		
		Observed	Adjusted [2]		Observed	Expected [1]	Adjusted [2]		Observed	Expected [1]	Adjusted [2]		Observed	Expected [1]	Adjusted [2]
Total	215	100.0	100.0	262	100.1	100.0	100.0	162	100.0	100.0	100.0	371	100.0	100.0	100.0
Reduced	0	0.0	0.0	24	9.2	0.0	9.2	4	2.5	0.0	2.5	19	5.1	0.0	5.5
Same	160	74.4	78.4	214	81.7	79.2	81.3	133	82.1	75.8	80.6	310	83.6	81.3	83.0
Improved	55	25.6	21.6	24	9.2	20.8	9.5	25	15.4	24.2	16.9	42	11.3	18.7	11.5

[1] Percentages that would be expected if this group had had no chronic illnesses.
[2] Percentages that would prevail if there were no age or family-size differences in the groups considered.

which were unaffected by chronic illness in 1923 and remained unaffected had a reduced socio-economic status. Of the 215 families in this group, 21.6 percent (adjusted for age and family size) had an improved status and the balance remained the same. These percentages are undoubtedly influenced by the generally high economic level of the war years, but this factor applies to all groups. This point will be discussed further in a subsequent section. The proportions in section A may, for comparative purposes, be considered as representative of the expected changes in socio-economic status of families free of the impact of chronic disease. For this reason, expected percentages of sections B, C, and D of table 5 are based upon the observed figures of section A, and therefore differ from the observed percentages of A only because of variations in the age and family-size structure of the groups.

Section B of this table is composed of families which were well in 1923 but which were reported as having illness or death from chronic disease at the 1943 survey. Over 9 percent of these families had a

reduction in economic status, while the percentage with an improved status was less than half of that which would be expected of families which suffered no chronic illness. Some of the families in section B may have had a reduction in status between 1923 and the time of occurrence of illness or death. Thus the differences between observed and expected figures in this section may not be solely a result of chronic disease.

However, this would not be true of the families included in section D, for among these families there was chronic illness prior to the change in economic status. The differences between observed and expected percentages in section D may actually be an underevaluation of the effect of chronic illness on economic status. Some of these families, in which there was illness in 1923, may have suffered a reduction in status prior to the initial survey and, having already financially accommodated themselves, had no further gross change in status between 1923 and 1943.

From these considerations it appears that the percentage of families in which there was reduction in economic status following chronic illness or death lies between 5.5 and 9.2, the limits indicated by the adjusted figures of sections D and B, respectively. Similarly, between 9.5 and 11.5 percent of the families with illness or death improved their economic status as compared with 21.6 percent of families which remained well. The observed percentages of sections B and D are both significantly different from the expected figures based on section A. In testing significance, "reduced" was combined with "same" because the zero percentage would yield no expected cases in the reduced catagory.

The observed percentages in section C also differ significantly from the expected, although the differences are not as great as for families in which illness or death was reported in the 1943 survey. The figures in this section indicate that families in which the ill members had recovered, had become accustomed to, or at least no longer complained of chronic illness, showed more improvement in economic status during the 20-year span, than families in which illness developed or continued. However, they showed less improvement than those which remained entirely free of disease.

Chronic Illness and Socio-Economic Status of Individuals

The families traced in 1943 originally contained 7,239 persons. There were 5,622 members of the 1,310 families that were unbroken, of known ages, and observed for more than 12 months in 1923. During the 20-year period ended in 1943 many children left the original households. Consequently their economic status in 1943, even when known, referred to family units other than those of which they were

members in 1923. Such information was therefore of doubtful value for the determination of the relationship of socio-economic status to chronic illness. At the time of the resurvey there were then 2,483 individuals still alive and still members of an original family group in which at least one of the parents remained alive in 1943. Figures concerning the economic status of individuals in 1943 include only these persons.

Table 6 shows the age and sex adjusted prevalence rates by socio-economic status of 5,622 persons in 1923 and 2,483 persons in 1943.

TABLE 6. *Prevalence of chronic illness among individuals, according to socio-economic status in 1923 and 1943*

Socio-economic status	Adjusted percent ill [1]	
	1923	1943
Total	18.8	24.2
Well-to-do	4.7	15.3
Comfortable	14.8	20.2
Moderate	18.4	23.2
Poor	19.6	33.3
Very poor	23.0	32.8

[1] Rates that would prevail if there were no age or sex differences in the groups considered.

In each survey the prevalence of chronic disease increases with poorer socio-economic status. There is, in general, increased prevalence in the 1943 data because the population is 20 years older. Chi-square tests reveal that both for 1923 and 1943, after adjustment for age and sex variations in the several socio-economic classes, the increase in prevalence with successively poorer status is statistically significant. These findings are in agreement with the figures presented where the family was used as the unit of observation. Individual and family results are compared in a later section.

The percentages of persons ill or dead from chronic disease in 1943, according to change in socio-economic status from 1923 to 1943 are: among individuals with reduced status, 40.9; same status, 25.1; improved status, 13.9. This relationship is statistically significant. These age and sex adjusted figures are based upon a population of 2,483 persons.

Table 7 shows the observed, expected, and age-sex adjusted percentages of persons who were ill or dead from chronic disease in 1943, among persons who were well at the time of the first survey. All these persons, numbering 2,040, had the same socio-economic status in 1943 or presumably at the time of death as in 1923. Granting possibilities of error already discussed in connection with table 4, it is probable that whatever variations exist in the rates of occurrence of chronic illness and death are attributable to differences in socio-economic

status. The crude rates of illness and death in table 7 show a slight decrease from 40.4 percent for the "well-to-do" to 35.7 percent for the "very poor." Other columns of this table reveal that this decrease is artificial, being caused by differences in the age and sex composition of the several groups. Actually, the percentage who died or became chronically ill in the three highest socio-economic categories is somewhat less than the expected; and in the two lowest categories it is somewhat greater than expected.

When tested for the probability that these differences may have arisen by chance, it is found that chi-square equals 10.22 and the

TABLE 7. *Proportion of persons ill or dead from chronic disease in 1943 among persons who were free of chronic disease in 1923, according to socio-economic status in 1923*

Socio-economic status, 1923	Percent ill or dead, 1943		
	Observed	Expected [1]	Adjusted [2]
Total	36.8	36.8	36.8
Well-to-do	40.4	44.7	32.5
Comfortable	39.5	44.5	32.9
Moderate	36.4	38.3	35.0
Poor	36.6	32.2	41.8
Very poor	35.7	32.8	32.8

[1] Rates that would prevail if chronic illness and socio-economic status were unassociated.
[2] Rates that would prevail if there were no age or sex differences in the groups considered.

value of P is approximately 0.04. If it be accepted that a probability of 5 in 100 is significant, then the deviations from the expected rates are probably not due to chance fluctuations. The differences between the observed and expected numbers in the "poor" group contribute to over half of the total value of chi-square given above. Comparisons among the other groups reveal no differences that could not have arisen by chance according to the usual methods of interpreting significance tests. Here, as in the figures based on families, it appears that socio-economic status is a factor of small importance in the development of chronic disease.

The observed and the age and sex adjusted percentages of persons whose socio-economic status changed is shown in table 8, according to presence or absence of chronic illness in 1923 and 1943. There are 1,596 persons included in section A, 425 in section B, 286 in C, and 176 in D. Almost the same pattern may be seen in this table as was observed for families in table 5. On the basis of the adjusted figures, 6.8 percent of the persons who became ill, and 5.9 percent of those who remained ill, had a reduction in economic status as compared to 2.5 percent among persons who remained free of chronic disease. When chi-squares were computed in the same manner as for the family data, it was found that the socio-economic changes of groups B and D differed significantly from the changes expected in a well population.

It will be noted that the adjusted percentages for persons who were ill in 1923 but who were reportedly well in 1943 are higher both in the "reduced" category and in the "improved" category than the corresponding percentages among persons who had no illness in either survey. This is true of the observed and expected figures computed for section C, but the differences are not statistically significant. There may be some suggestions from the high percentage in the "improved" category that cure or rehabilitation (possibly psychological) of the chronically ill led to the improvement of their socio-economic position.

TABLE 8. *Percentage of persons in each category of change in socio-economic status according to history of chronic illness in 1923 and 1943*

Change in socio-economic status	A		B		C		D	
	Well in 1923; well in 1943		Well in 1923; ill in 1943		Ill in 1923; well in 1943		Ill in 1923; ill in 1943	
	Observed	Adjusted [1]	Observed	Adjusted [1]	Observed	Adjusted [1]	Observed	Adjusted [1]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Reduced	2.5	2.5	8.2	6.8	3.9	4.0	5.1	5.9
Same	76.9	78.0	81.7	79.6	74.8	73.9	87.5	83.5
Improved	20.6	19.5	10.1	13.6	21.3	22.1	7.4	10.6

[1] Rates that would prevail if there were no age or sex differences in the groups considered.

Discussion

It is apparent that when chronic illness and socio-economic status are investigated from the standpoint of either the individual or the family one finds that an inverse relationship exists. Yet it is doubtful that one could obtain a true account of the economic aspects of the impact of chronic disease upon the population through a study based solely on individuals, for illness affects the status not only of the ill person, but also of every member of his family. Thus considering the 1923 figures, which contain persons of all ages, 18.8 percent of the individuals were affected by chronic disease, whereas 55.0 percent of the families were so affected. From these observations it may be concluded that a clearer view of the magnitude of public health or welfare problems is obtained when they are measured in terms of families rather than of individuals.

It is known that unfavorable economic circumstances make difficult the arrest of certain chronic illnesses, because of the need for constant medication, proper food or diet, favorable working conditions, or sufficient rest. But the number of chronic diseases for which it has been shown that poor economic and environmental circumstances play a part in causing the illness is limited, and these, with the excep-

tion of tuberculosis, are of low prevalence save in certain geographic sectors. Though tuberculosis is included among the diseases in this report, a study of these cases reveals that their exclusion from tables 4 and 7 would alter little the figures shown. These figures, for families and for individuals, indicate that socio-economic differences probably have an effect on the occurrence of chronic illnesses, but that the association is not of great magnitude and, in the case of families, is not statistically significant.

Information as to the extent to which lowered economic welfare is related to, and may cause, illness is given in a study by Perrott and Collins (*8*). This survey of 10 localities included all types of illnesses and accidents within 3 months of the interview, these ailments being classified as to whether they were disabling or nondisabling and further as to whether the onset was during the 3-month period or before that period. The latter group included diseases of a more or less chronic nature. Persons who dropped from a comfortable economic status in 1929 to a poor status in 1932 had a disabling illness rate of 174 per 1,000 for the 3-month survey period as compared with a rate of 120 per 1,000 for persons who remained in comfortable circumstances from 1929 through 1932. The rates for disabling diseases with onset prior to the survey period were, respectively, 53 per 1,000 and 30 per 1,000. Since the sickness rates were higher among families that suffered the greatest change in standard of living, and since the excess in illness existed among children as well as among adults, it was concluded that the income loss had a part in causing these higher sickness rates in 1933.

The social and economic strains imposed by chronic illness in the family are well known and have been discussed by Boas (*9*). In addition to physicians' and nurses' bills, medicines, and special foods, the family often suffers loss or reduction of income, costs for household help, or costs for care of children. Such expenses place a severe burden not only on the poor but also on families in comfortable circumstances. Evidence of the extent to which chronic disease may impair socio-economic status is shown in tables 5 and 8. Again the value of employing the family, rather than the individual, as the unit of study may be seen. There were 40 individuals who, though well in 1923 and well in 1943, had a reduced economic status in the later period. But it is evident from the absence of families in the corresponding category of table 5 that all these 40 persons were members of families in which chronic illness occurred.

About 10 percent of the families with illness improved their status in spite of the chronic disease, as compared with approximately 20 percent showing improvement among families free of disease. It is difficult to assess the extent to which the high level of employment and economic conditions of this area in 1943 may have influenced

these figures. However, it is known that persons previously "unemployable" because of chronic disease or impairment were full-time or part-time employees during the war years. Many of these persons were exempted from military service because of their disability. Further, large numbers of women whose husbands or fathers were dead or disabled, and who previously had little income, were fully employed at good wages in 1943. Hence it is quite possible that, although the economic status of the general population improved during the war, families in which there existed chronic illness had a relatively greater economic improvement. If this is true, the figures shown in this report present a modest picture of the influence that chronic illness would have on change in socio-economic status during "normal" times.

Summary

This report is based upon 1,310 families and 5,622 persons surveyed in 1923, and 1,010 families and 2,483 persons resurveyed in 1943. These families were classified into five socio-economic groups in each of the two surveys, and the gross change in socio-economic status between the two periods was recorded. Information concerning chronic illnesses in the family was recorded in 1923 and again in 1943, along with deaths from chronic diseases during the 20-year span. Analysis of these data reveals:

1. For families and for persons the prevalence of chronic diseases progressively increased from the "well-to-do" to the "very poor" in 1923 and also in 1943.

2. Families which had a reduction in socio-economic status between 1923 and 1943 had an adjusted chronic disease rate in 1943 of 87.2 percent, almost twice as high as the rate for families with an "improved" status.

3. Among families which were free of chronic illness in 1923, those which were in favorable socio-economic circumstances in 1923 and remained in favorable circumstances developed chronic diseases at a rate which was only slightly lower than the computed expected rate. Families which were poor in 1923, and remained poor, developed chronic illnesses at a rate slightly above the expected. For families, the differences between observed and expected figures are without statistical significance. When individuals are used as the unit of observation, the trend is the same as for family units, but the differences, though small, are probably outside the limits of chance variation. It is concluded that socio-economic status is a factor, but of only slight importance, in the chances of occurrence of chronic illness in this population.

4. Chronic disease is a more significant factor in causing reduced socio-economic status. Of the families in which there was no chronic illness in 1923 or in 1943, none had a reduction in status and 21.6 percent showed an improvement. Of those families which had no chronic illness in 1923 but which in 1943 reported illness or death from chronic disease, 9.2 percent suffered a gross reduction in status while 9.5 percent "improved." Among families in which chronic illness existed in 1923 and in which there was reported chronic illness or death in 1943, there were 5.5 percent with "reduced" status and 11.5 percent "improved." The same picture is presented when the material is studied for individuals, but the differences between the percentages for the well population and for the chronically ill populations are not as marked as in the case of families. This results from the fact that 2.4 percent of the well persons in this study had a reduction in status, but all these persons were members of families in which chronic illness occurred.

ACKNOWLEDGMENT

The writer is indebted to Dr. Antonio Ciocco for valuable advice in the preparation of this report.

REFERENCES

(*1*) Ciocco, A.: Chronic sickness in relation to survivorship twenty years later. Human Biol. **18**:33–48 (1946).
(*2*) Sydenstricker, E.: A study of illness in a general population group. Hagerstown Morbidity Studies, No. 1. The method of study and general results. Pub. Health Rep. **41**:2069–2088 (1926).
(*3*) Lawrence, P. S.: An estimate of the incidence of chronic disease. Pub. Health Rep. **63**:69–82 (1948).
(*4*) Pearl, R.: Introduction to Medical Biometry and Statistics. W. B. Saunders Company, Philadelphia, 1940.
(*5*) Bigelow, G. H., and Lombard, H. F.: Cancer and Other Chronic Diseases in Massachusetts. Houghton Mifflin Co., Boston. 1933.
(*6*) Britten, R. H., and Altman, I.: Illness and accidents among persons living under different housing conditions. Data based on the National Health Survey. Pub. Health Rep. **56**:609–640 (1941).
(*7*) The National Health Survey: Illness and Medical Care in Relation to Economic Status. Preliminary Reports, Sickness and Medical Care Series, Bull. No. 2, Public Health Service, 1938.
(*8*) Perrott, G. St. J., and Collins, S. D.: Relation of sickness to income and income change in 10 surveyed communities. Health and Depression Studies No. 1. Method of study and general results for each locality. Pub. Health Rep. **50**:595–622 (1935).
(*9*) Boas, E. P.: The Unseen Plague—Chronic Disease. J. J. Augustin, New York, 1940.

809188—48——3

Leprosy: Factors in Public Health Management

By G. W. McCoy, M. D.[1]

The intelligent management of the public health program of leprosy in the United States calls for consideration of a new approach to the matter of isolating victims of the disease. We hope that by now the routine control procedure—isolation of all cases of leprosy regardless of the possibility that some patients may not be a menace to their associates—has been discarded. This indiscriminate manner of dealing with this disease can be dropped without regret, as there is no substantial evidence that it aided in controlling the infection. The use of the newer and more promising therapeutic agents for which we are indebted to G. H. Faget,[2] and his associates prompts the adoption of newer procedures that will bring cases under observation earlier in the course of the disease when the results of treatment ought to be more favorable. The clinical staff at the National Leprosarium at Carville deserves great credit for the patient, intelligent way in which the treatment of leprosy cases has been pursued.

Without attaching significance to the order in which the factors in this problem are discussed here, it may be advisable to consider the following:

Clinical types in relation to communicability—Students of leprosy generally believe that only the lepromatous, or nodular form is likely to be a source of infection and that the neural or anaesthetic type is of minor importance on this point. The mixed form, which presents manifestations of the lepromatous and neural types, is regarded as of the same order of communicability as the lepromatous. Many cases of both types, either spontaneously or as a result of therapy, reach a condition of apparent recovery, or arrest, often with great deformity, and should not be regarded as a source of infection. Spontaneous arrest or recovery probably happens more frequently, particularly in children, with the neural type than with the lepromatous. If a diagnosis of leprosy cannot be made when the case comes under observation, it should be regarded as free from the risk of transmitting the disease. The possibility of relapse in arrested cases must always be remembered.

The evidence for regarding neural and anaesthetic cases as relatively free from danger of transmitting the disease is somewhat

[1] Medical Director, Retired, Public Health Service.

[2] Faget, G. H., M. D., Erickson, P. T., M. D. Chemotherapy of Leprosy. J. A. M. A. 136: 451 (1947)

conflicting. We have had so little success with public health measures up to the present time that it seems wise to adopt a lenient view toward cases about which there is doubt of communicability. Put another way, the patient should receive the benefit of the doubt. For example, the Norwegian health authorities seem to have had success in the public health management of the disease. They have stressed the isolation of cases they regarded as communicable, rather than employ measures bringing all cases, regardless of clinical type, under isolation.

Diagnosis—Diagnosis is of primary importance, since specialists in the medical treatment of leprosy believe it is important to bring cases under the influence of therapeutic agents as early as possible. Even in this light, however, a delay of a few weeks generally does not matter. It is better to examine a patient repeatedly than to make an erroneous decision on the basis of inadequate evidence.

Ordinarily, in cases of any type that reach full development, the clinical diagnosis is easy. Difficult to diagnose are the cases in early stages, in which the signs and symptoms are obscure. The lepromatous type is charcterized by infiltration of the skin with the formation of definite nodules or less localized lesions. On microscopic examination this type almost invariably yields smear preparations containing acid-fast organisms. As this is the form regarded as most dangerous to others, it is fortunate that we have such a simple, relatively certain diagnostic test. The neural type, including the tuberculoid sub-type, usually must be diagnosed on clinical grounds—anesthesia, atrophy, and gross enlargement of nerve trunks—as these are the striking manifestations of the advanced neural form. In addition to significant skin findings, the tuberculoid sub-type requires the presence of a characteristic histo-pathologic picture; this form rarely shows the presence of acid-fast organisms. Since the tuberculoid sub-type is regarded as of good prognosis regardless of treatment and not likely to be transmitted, its recognition is not as important from a public health point of view.

Something of the difficulty of diagnosing the neural type can be seen from the following case: A 70-year-old male, resident of a notorious leprosy focus, with symptoms that left doubt between syringomyelia and leprosy appeared for diagnosis. An experienced clinician thought the former could be ruled out. The case was observed for several months by several physicians, highly skilled in the recognition of leprosy, who subscribed to the latter diagnosis. The man died of pneumonia. The spinal cord was submitted to two pathologists. They were unable to make a diagnosis but agreed that the lesions were not compatible with either syringo-myelia or leprosy. Perhaps

the spinal cord is not the most suitable material for the pathological diagnosis of leprosy.

Nasal smears—There is a widespread impression that the detection of acid-fast bacilli in smear preparations from the nasal cavities is of great value in diagnosis. It is true that specimens from the area—if showing characteristic organisms—are valuable; but they are not likely to be present in early cases—a few isolated acid-fast bacilli having no relation to Hansen's bacilli often are found in nasal smears. It seems that nasal smears are much less employed than formerly by experienced workers in this field.

Tissue smears—When characteristic bacilli are present, the diagnosis is secure. Occasionally, however, organisms are found that require very careful appraisal before a decision can be made. A case has been noted in which a discharging sinus on a finger, probably from a syphilitic gumma, yielded acid-fast bacilli that were similar to those of leprosy and could be distinguished from those of leprosy only by comparing them simultaneously under another microscope with authentic Hansen's bacilli. The nature of the organism never was established and clinically the case was not leprosy. Ulcerating infiltrations or nodules yield characteristic organisms but ulcerating trophic lesions, of which perforating ulcer of the sole is the best example, do not yield leprosy organisms.

Histopathology—Reports by competent pathologists have often confused and misled me more than they aided. Unless acid-fast bacilli can be demonstrated in sections, about the best we can hope for is a report that the tissue is probably from a leprosy case. Several times I have received this report where leprosy could be excluded on clinical grounds. The most frequent error is to confuse sarcoid with leprosy. Probably most pathologists feel that leprosy and sarcoid cannot be distinguished by tissue architecture. In another case, a definite diagnosis of leprosy by a clinical pathologist was withdrawn when he failed to find acid-fast bacilli in the tissue—the case bore no resemblance to leprosy clinically. No satisfactory diagnosis ever was achieved. Tissue scrapings have been much more useful to me than biopsy preparations. In rare instances cases fail to show acid-fast organisms in skin scrapings but will show them in biopsy material together with suggestive pathologic structure. In these instances the pathologist can be of considerable help.

Immunologic tests—These tests give little or no help. The Wassermann reaction and other serologic tests for syphilis often are positive in leprosy apparently without the coexistence of syphilis. Failure to recognize this fact on many occasions in my experience has led to erroneous diagnosis of syphilis when the patient had leprosy only. Patients with leprosy often give a positive tuberculin test but this has

not been confusing, possibly because interpretation of the significance of a positive tuberculin test in adults is fraught with uncertainty in any case. Preparations from leprosy tissue (Lepromin or Leprolin), properly prepared and sterilized when given into the skin, are said to be of value in prognosis but are generally considered of no value in diagnosis. While not an immunologic test, the intracutaneous injection of histamine is reported to be of value in distinguishing between neural leprosy and diseases of central nervous system origin. If the claims put forward for this test are well founded, it should be of value in distinguishing leprosy from syringo-myelia, since at times it is very difficult or impossible to differentiate between them.

General considerations—If the patient under investigation never has been in an area in which leprosy is transmitted, the diagnosis is likely to be something else. The writer has seen two family groups of cases in which any of the individual cases would have passed as neural leprosy, and several were so diagnosed. Since the condition developed in parts of the country where leprosy was not found, however, and the cases were similar to one another in each family group, a diagnosis of leprosy was excluded. Epidemiologic factors may be of more importance in the diagnosis than purely clinical findings.

Age—It is rare for leprosy to develop under the age of 10 and very rare under 5. Very recently, a diagnosis of leprosy was excluded tentatively because the patient was a child only a year old. While it is common for infections to be contracted in the early years of life, leprosy usually becomes clinically manifest in approximately the second decade, because of the long incubation or latent period.

While the general considerations are not conclusive at times they are very helpful—especially if a long-range attempt at a diagnosis must be made.

Epidemiology—It has become the fashion to ascribe all cases of leprosy to childhood infections though, as mentioned above, clinical indications may not be recognized until years later. This widespread acceptance of the view that infection generally is acquired in infancy appears to be well founded but I have seen too many cases in which the infection could only have been acquired in adult life to subscribe fully to the view of exclusive childhood infection. In areas where there is danger of transmission, great stress should be laid on the avoidance of the exposure of children, especially to communicable cases.

In the United States, leprosy spreads to an extent that makes it a public health problem, only in Florida, Louisiana, and Texas. In California, only about 23 cases have become infected within the State among a total of about 600 reported, the remainder having

been infected abroad—chiefly in Mexico, China, and in the Pacific Islands including Japan.

Considering the great variation in spread in various parts of the country, very tentatively we might classify the different areas of transmission somewhat as follows:

Very feebly communicable—New England where a single case has been reported; and the greater part of the remainder of the country.

Feebly communicable—South Carolina and Georgia, where cases occur at intervals of several years. California and Minnesota, where more cases have occurred but the tendency is to disappear.

Markedly communicable—Texas, where a considerable proportion of infections are acquired in the State.

Highly communicable—Florida and Louisiana, where substantially all infections are acquired within these States.

Obviously, if what is presented above is sound, it no longer suffices to make a diagnosis of leprosy and commit the patient to a leprosarium. Cases might be considered from the public health point of view to fall into one of the following groups:

No special consideration—non-communicable cases in areas where transmission is unlikely.

Home isolation or general hospital—any cases in areas where transmission is unlikely.

Special hospitals—communicable cases in areas where spread is likely to occur.

Of course, the attitude of the general public must always be considered; this attitude in the past has largely influenced the practice of health officers. We must educate the public in the realities of the problem.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 30, 1948

A net decrease of 249 cases, or 23 percent, occurred in the reported incidence of poliomyelitis—from 1,079 cases last week to 830 currently, as compared with a decrease of 261 cases, or 27 percent (976 to 715), for the corresponding week in 1946. The corresponding 5-year (1943–47) median for the week is 489. A combined decrease of 223 cases was reported in 11 of the 18 States reporting currently 10 or more cases (from 745 to 522); one State, New York, reported 55 cases for each week, and 6 States (Indiana, Michigan, South Carolina, Texas, Utah, and Washington), none reporting more than 52 cases, showed a combined increase of 35 cases (115 to 150). The total for the year to date is 23,424, as compared with 22,377 for the same period in 1946 and a 5-year median of 11,952.

Of the total of 2,064 cases of influenza reported (last week 1,756, 5-year median 1,549), 1,735 occurred in 3 States—Texas (1,205, last week 945), South Carolina (279, last week 252), and Virginia (251, last week 267). For the corresponding week last year, 1,256 of the 1,576 cases reported occurred in the same 3 States. Since July 31, approximately average date of seasonal low incidence, these States have reported 12,827 of the total of 15,306 cases, and for the same period in 1945 they reported 11,295 of the total of 14,074, the highest corresponding figure of the past 6 years.

The current and cumulative figures since the average seasonal low date (September 1, 1948), for measles are, respectively, 1,789 and 8,550, as compared with corresponding 5-year median figures of 1,190 and 5,767.

One case of Rocky Mountain spotted fever was reported for the week, in North Carolina. The cumulative figure to date is 507, as compared with 535 for the same period last year and a 5-year median of 451.

A total of 9,116 deaths was recorded for the week in 93 large cities in the United States, as compared with 8,946 last week, 8,880 and 8,616, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,880. The total for the year to date is 403,826, as compared with 403,352 for the corresponding period last year. Infant deaths totaled 632, as compared with 699 last week and a 3-year median of 689. The cumulative figure is 29,267, as compared with 32,475 for the same period last year.

Telegraphic case reports from State health officers for week ended October 30, 1948

(Leaders indicate that no cases were reported)

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [d]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine				247		5			13				38	
New Hampshire									3				4	
Vermont				44		1	2		6				12	
Massachusetts	5	1		251	2	12	6		63				47	
Rhode Island	1			1					2			1	9	
Connecticut				27	1	32	5		18				8	
MIDDLE ATLANTIC														
New York	5		[b]2	114	6	184	55		[c]83			4	93	17
New Jersey	1		6	33	1	47	25		19			1	30	4
Pennsylvania	10		(b)	24	6		25		87			2	68	2
EAST NORTH CENTRAL														
Ohio	9			10	2	25	14		113			6	27	14
Indiana	10			6	1	7	18		23		2		8	
Illinois	3		13	10	4	138	21		81				22	2
Michigan [a]	3		4	128	3	31	52		75			3	19	13
Wisconsin	1			60	1	2	32		20			1	29	
WEST NORTH CENTRAL														
Minnesota	3			3	1	8	63		34			1	17	1
Iowa	1	1		5	4	1	44		14			1	17	1
Missouri	5			25	2	13	1		23			3	6	
North Dakota				14										
South Dakota				1		1	58		2					
Nebraska	2		10	2		1	13		17				1	
Kansas	4		10	3		10	5		19			2	2	
SOUTH ATLANTIC														
Delaware	2						2		1					
Maryland [a]	2			37		17	6		[c]9			3	13	
District of Columbia				1		10	6		5				5	
Virginia	7		251	35		29	9		14			2	6	2
West Virginia	6		18	17			4		30				10	
North Carolina	10			18	1		29	1	31		1	3	21	

South Carolina	32	2	279	8	1	65	11		4				21	5
Georgia	23		4	4		11	3		35		1	1	2	7
Florida	15	1	4	7	1	13	8		10			1	9	3
EAST SOUTH CENTRAL														
Kentucky	17		2	29	1	12	3		45				14	11
Tennessee	18		15	6	1	34	6		46			2	7	
Alabama	39		24	23	4	16	2		35			2	3	6
Mississippi [a]	9		9	11		32	4		13			1	1	
WEST SOUTH CENTRAL														
Arkansas	10		71	3	1	24	1		7		1	6	24	2
Louisiana	6		2	44		38			11			4		
Oklahoma	4		34	1		2	3		11				1	
Texas	29		1,205	210	2	100	31		37			5	55	24
MOUNTAIN														
Montana			3	12		1	7		18				4	
Idaho			14	8		9	1		[c]3					
Wyoming			1	21		1	1		2		1		3	
Colorado	2		35	39		20	3		6			1	6	
New Mexico	5		1	2	1	19	5		2			2	10	
Arizona	5		27	20		18	3		1			1	2	
Utah [a]	7		31	73		6	16		1		2		3	
Nevada														
PACIFIC														
Washington	4		3	54	2	2	22		23				8	
Oregon	1		10	80		15	7		13			2	6	
California	11		3	38	3	20	198		68			7	45	2
Total	327	5	2,091	1,809	52	1,032	830	1	1,196		8	68	735	
Median, 1943–47	409	12	1,549	1,190	97		489	3	2,355	6	8	88	2,023	
Year to date, 43 weeks	7,661	479	154,148	560,009	2,717		23,424	507	62,710	53	807	3,067	65,738	
Median, 1943–47	10,712	552	201,458	551,026	7,015		11,952	451	113,474	306	689	4,271	104,825	
Seasonal low week ends	(27th)		(30th)	(35th)	(37th)		(11th)		(32nd)	(35th)		(11th)	(39th)	
	July 10		July 31	Sept. 4	Sept. 18		Mar. 20		Aug. 14	Sept. 4		Mar. 20	Oct. 2	
Since seasonal low week	3,051		15,333	8,595	281		23,074		7,094	3		2,594	2,815	
Median, 1943–47	4,448		11,261	5,767	520		11,555		13,574	28		3,647	7,289	

[a] Period ended earlier than Saturday.
[b] New York City and Philadelphia only, respectively.
[c] Including cases reported as streptococcal infections and septic sore throat.
[d] Including paratyphoid fever, reported separately, as follows: Alabama 1; Louisiana 1; Texas 1; Colorado 1; Oregon 1; California 2. Salmonella infections, not included, reported separately, as follows: Massachusetts 1.

Alaska: Measles 1.
Territory of Hawaii: Measles 98; lobar pneumonia 1; whooping cough 3.

PLAGUE INFECTION IN GRANT COUNTY, WASHINGTON

Plague infection has been reported proved in a pool of 118 fleas from 55 short-tailed meadow mice, *Lagurus curtatus*, trapped October 12 in Grant County, Washington, 7 miles northwest of Ephrata.

DEATHS DURING WEEK ENDED OCT. 23, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended October 23, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	8,946	8,675
Median for 3 prior years	8,739	
Total deaths, first 43 weeks of year	394,710	394,472
Deaths under 1 year of age	700	702
Median for 3 prior years	702	
Deaths under 1 year of age, first 43 weeks of year	28,636	31,786
Data from industrial insurance companies:		
Policies in force	70,837,748	67,098,002
Number of death claims	12,977	12,034
Death claims per 1,000 policies in force, annual rate	9.6	9.4
Death claims per 1,000 policies, first 43 weeks of year, annual rate	9.3	9.2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 9, 1948.—During the week ended October 9, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		18		26	92	27	36	64	53	316
Diphtheria		1	1	14	3	1				20
Dysentery, bacillary				2						2
Encephalitis, infectious					1					1
German measles				5	11		1	1	5	23
Influenza		21			6	1			4	32
Measles		14	1	152	59	11	12	7	5	261
Meningitis, meningococcal					2		1			3
Mumps		2	1	27	54	28	16	8	12	148
Poliomyelitis			1	1	20	8	7	15		52
Scarlet fever		3	4	50	38	3	10	4	11	123
Tuberculosis (all forms)		4	14	64	24	18	32	58	41	255
Typhoid and paratyphoid fever				5	3					8
Undulant fever				2			2	1		5
Venereal diseases:										
Gonorrhea	6	17	17	128	83	28	17	59	75	430
Syphilis	2	6	13	102	46	10	6	8	21	214
Whooping cough		6		76	7	2	5	1		97

FINLAND

Notifiable diseases—August 1948.—During the month of August 1948, cases of certain notifiable diseases were reported in Finland, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	11	Paratyphoid fever	95
Diphtheria	239	Poliomyelitis	13
Dysentery	2	Scarlet fever	210
Gonorrhea	1,295	Syphilis	209
Malaria	4	Typhoid fever	29

JAMAICA

Notifiable diseases—5 weeks ended October 2, 1948.—During the 5 weeks ended October 2, 1948, cases of certain notifiable diseases

were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1	1	Poliomyelitis	1	
Chickenpox	1	7	Puerperal sepsis		1
Diphtheria	2	6	Tuberculosis (pulmonary)	32	71
Dysentery, unspecified	2		Typhoid fever	5	109
Leprosy	1	2	Typhus fever	1	

NETHERLANDS INDIES

Poliomyelitis.—An outbreak of poliomyelitis was reported in the Netherlands Indies on September 4, 1948, with 20 cases, 1 death, in Tandjong Pandan and other localities on Billiton Island. Up to the first of October a total of 47 cases with 4 deaths had been reported, stated to have occurred in all races, principally in children.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

Note.—The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India.—During the two weeks ended October 16, 1948, 401 cases of cholera with 67 deaths were reported in Madras, 98 cases, 37 deaths, in Calcutta, 2 cases (imported) in Bombay, and 3 cases with 3 deaths (first cases) in Allahabad.

Pakistan—Lahore.—During the two weeks ended October 9, 1948, 54 cases of cholera with 7 deaths were reported in Lahore.

Plague

Ecuador.—During the period September 1–15, 1948, 7 cases of plague were reported in Ecuador, all in Loja Province, as follows: Celica Canton—Tablazon 1 case; Macara Canton—Gonzanama 2 cases, Lamara 4 cases.

India—Bombay.—Under date of October 29, 1948, 3 cases of plague (nonimported) were reported in Bombay. During the week ended October 9, 2 plague-infected rats were reported found in the city.

Union of South Africa.—During the week ended October 16, 1948, 1 case of plague was reported in Nguka, Glen Gray District, Cape Province.

Smallpox

Colombia.—During the month of September 323 cases of smallpox with 5 deaths were reported in Colombia.

French West Africa—Dahomey.—During the three weeks ended October 20, 1948, 50 cases of smallpox with 4 deaths were reported in Dahomey.

British East Africa—Nysaland.—During the week ended October 2, 1948, 4 cases of smallpox were reported in Lilongwe, and cases were reported in other localities as follows: Blantyre, 30 cases, 6 deaths; Chickwawa, 3 cases, 1 death; Cholo, 14 cases, 4 deaths; Dedza, 3 cases, 3 deaths; Fort Johnson, 20 cases, 2 deaths; Liwonde, 8 cases, 3 deaths; Ncheu, 7 cases; Port Herald, 2 cases.

Typhus Fever

China—Peiping.—During the period September 11–20, 1948, 1 case of typhus fever was reported in Peiping.

Colombia.—During the month of September 1948, 309 cases of typhus fever with 6 deaths were reported in Colombia.

Ecuador.—During the period September 1–15, 1948, 4 cases of typhus fever (1 murine) were reported in Ecuador, of which 1 case (murine) occurred in Guayaquil.

Greece.—During the week ended October 16, 1948, 31 cases of typhus fever were reported in Greece, in Departments as follows: 20 cases in Pella and 11 in Salonique.

Yellow Fever

Venezuela.—On October 6, 1948, a fatal confirmed case of yellow fever was reported in Boatanamo, Tumeremo Canton, State of Bolivar. The locality was stated to be an endemic area of jungle yellow fever.

×