THE IMPORTANCE OF FAMILY PROBLEMS IN THE CONTROL OF TUBERCULOSIS[1]

JEAN DOWNES AND CLARA R. PRICE, R. N.

THE outstanding tuberculosis problem in New York City is the control of the disease among Negroes. Their mortality from tuberculosis was 220 per 100,000 in 1940 compared with a rate of 43 among white persons.[2] If eradication of tuberculosis is to become more than a hope, serious consideration must be given to those population groups where the problem is acute. With these facts in mind, a special study of tuberculosis was started April 1, 1939 in the upper part of Harlem. It is hoped that this study will point the way to the most effective public health procedures for the control of the disease among the Negro population of New York.

The fundamental requirements of a program aimed toward eradication of tuberculosis include (1) case-finding; (2) hospitalization; and (3) consideration of the social and economic problems of the tuberculous individual and his family. This report deals particularly with the problems of the tuberculous family which are being encountered in Harlem, their nature and the extent to which they are being overcome or solved.

DATA AND METHOD OF STUDY

The special study was set up in an area of Upper Harlem, comprised of some thirty-five city blocks. Thirty-two thousand Negroes in 8,500 household units live in this area.[3] The families of all active or recently active cases of tuberculosis in the area are being given intensive public health nursing and clinic supervision.

[1] From the Milbank Memorial Fund, the Community Service Society, and the New York City Department of Health.

Presented at the Annual Health Conference of the Philadelphia Tuberculosis and Health Association, November 18, 1941.

[2] The rate 220 per 100,000 includes Negroes and other colored. From "Net Tuberculosis Mortality, 1940"; the New York Tuberculosis and Health Association.

[3] Data from the residential census, Real Property Inventory—City of New York—Borough of Manhattan, Residential Report, 1934.

Dr. Herbert R. Edwards, Director of the Bureau of Tuberculosis, is medical director of the study. The medical staff of the tuberculosis clinic is provided by the Department of Health. The nursing and clerical staffs are provided by the Community Service Society. The nurses represent the Department of Health and are responsible for the public health nursing care of the tuberculous patients and their families. The nurses who do the home visiting also serve in the clinic.

The emphasis in this study is being placed upon the family. The clinic is primarily to serve the tuberculous family. Its other activities include a consultation service for private physicians and case-finding among individuals who voluntarily apply for an examination. However, the bulk of clinic service is used by those persons who have lived in intimate contact with infectious tuberculosis.

A definite effort is being made to preserve the family unit which otherwise might be broken up by the disability and hospitalization of its tuberculous members and to preserve the health of the contacts. Obviously, the clinic physician and the public health nurse have an important part to play in this effort.

Detailed records concerning the social and economic condition of each family are being obtained by the nurses and the families are visited at fairly frequent intervals in order to note any changes in these conditions. The data being collected are as follows: The persons who make up the household are listed. The place and date of birth, length of residence in New York City, present employment status, and relationship to the head of the household are indicated for each person in the household. Cause of death, place of death, and date of death are listed for all deceased members of the family. Nature of employment is procured for all employed persons. Data are being obtained also as to the amount and source of income, and the amount paid for rent. At monthly intervals information is obtained concerning the amount spent for food and the types of food eaten by the family during the preceding week.

Attention is given to all health problems in the family. Persons suffering with chronic disease other than tuberculosis are listed and a record is obtained of medical care, both clinic and private physician's care, received by them.

These detailed records for each family were devised to serve a dual function. First, they were to afford a fairly accurate picture of the social and economic environment, and of the health problems in the family, all of which must be considered if effective control of tuberculosis is to be accomplished. Second, they were to form a point of departure for public health teaching by the nurse, since they may indicate certain outstanding problems in each family. For example, the nurse is asked to go over carefully the information which she has obtained for each family under her care and to set down on the nursing record the problems which she notes and which must be considered on her next visit to the family. The effectiveness of her teaching is determined in part by her progress in solving the problems which she has outlined.

The Tuberculosis Problem in the Family

Preliminary to a description of certain aspects of the environment of the tuberculous families and to an evaluation of the effectiveness of the first two years' efforts in the control of the disease, it is important to indicate briefly the seriousness of the tuberculosis problem among them.

One hundred and forty-four families or households, observed one month or longer, have formed the study group. The period of observation has varied from one to twenty-four months. These families are representative of the 8,500 households from which they are drawn in respect to average size. The average size of the 144 households was the same as the average for the households of the entire area, namely, 3.8 persons per household. The average amount of rent, $33 per month, was somewhat lower than the average ($37) for the area as a whole. The degree of crowding was greater in the tuberculous families. Twenty-four per cent of the 8,500 households

had more than one person per room; 40 per cent of the families in the special study had more than one person per room.

Most of the families have been recently exposed to infectious tuberculosis. In approximately 75 per cent of the 144 families the index case, that is, the tuberculosis case which brought the family into the study, had, or had recently had, demonstrable tubercle bacilli in the sputum.

It is important also to draw attention to the fact that the population of the district is an extremely mobile one. According to census data collected when the Real Property Inventory was made in New York City in 1934, 50 per cent of the families in the area of Harlem being studied reported that they had lived less than a year in their present living quarters.[4] The 144 tuberculous families constituting the special study group and drawn from this population had the same moving rate, that is, 50 per 100 per year. Effective public health supervision of the family is more difficult to accomplish under these circumstances than would be the case in a more stable population.

In evaluating the work of the first two years of study in Harlem it is suitable to divide the 144 families into two groups: (1) those observed or supervised less than twelve months, and (2) those observed twelve months or longer. There were 50 families, including 192 persons, in the first group designated as Group 1 and 94 families, including 417 persons, in Group 2.

The two groups of families were fairly similar with respect to the possibility of exposure of their members to a case of infectious tuberculosis. In 75 per cent of the families the index case was known to have, or to have had, a positive sputum.

The index case, that is, the case which brought the family into the study, was either the husband or the wife in approximately 50 per cent of both groups of families. This fact is important because

[4] Data from the residential census, Real Property Inventory—City of New York—Borough of Manhattan, Residential Report, 1934.

the problem of stabilizing the family and of preserving its unity is greatly affected by the individual ill with tuberculosis, especially if that person has responsibilities as a wage-earner or as a housewife. In the remainder of the families the index case was a son or a daughter or other blood relative of the head of the household or of the wife.

Family Problems Other Than Tuberculosis

Because of the infectious nature of tuberculosis, the problem of control of the disease is concentrated in the immediate environment of the positive sputum case, that is, in the family or household unit. It is believed also that the most effective public health work in the family can be accomplished only with an understanding of the general health, social, and economic situation of the family. It was for this reason that detailed information concerning the presence or absence of problems in these categories was recorded for each family.

Chronic Disease. The nurses were to inquire about chronic disease other than tuberculosis among the nontuberculous members of the family. Table 1 shows the chronic conditions reported for each group of families. Approximately 40 per cent of the families in

Table 1. Number of families with chronic condition other than tuberculosis.

Type of Chronic Condition or Impairment	Group 1 (50 Families)			Group 2 (94 Families)		
	Total Families	Total Cases of Chronic Disease	Cases Under Medical Care	Total Families	Total Cases of Chronic Disease	Cases Under Medical Care
Total Chronic Cases	19	20	9	52	56	36
Syphilis	8	8	5	24	26	16
Diseases of the Heart and Arteries	6	6	2	13	14	8
Arthritis	1	1	0	5	6	4
Diabetes	0	0	0	3	3	3
Hernia	1	1	1	2	2	1
Gastric Ulcer	2	2	0	2	2	2
Mental Disease or Mental Deficiency	1	2	1	3	3	2

Group 1 reported a case of chronic illness; in Group 2 slightly more than 50 per cent reported the presence of chronic disease. Syphilis was the leading cause of chronic illness with diseases of the heart and arteries second in importance. It should be emphasized that cases reported by the family are only those causing disability. An examination of all members of the family, for example, for syphilis or heart disease would undoubtedly reveal more cases. When these data are considered in relation to disability from tuberculosis in these families, it is apparent that they carry a very heavy burden of illness. Furthermore, with the exception of mental deficiency and rheumatic heart disease, these conditions, including tuberculosis, are generally peculiar to adults. This means that an exceedingly high proportion of the ordinarily productive members of the family were partially or wholly incapacitated.

Since the public health nurse is concerned with the health problems of the entire family, it is gratifying to note that 36 of the 56 cases in the Group 2 families were under medical supervision. In the families observed less than twelve months, Group 1, less than half of the reported cases had medical care, either private physician or clinic care.[5]

General Health, Social, and Economic Problems. In addition to the record of chronic illness, the nurses were to indicate other problems in the family and to indicate also what she had done about them. For convenience in analysis the problems have been allocated to the following broad categories: (1) "general health problems"; (2) "economic"; and (3) "social problems." Theoretically and actually, these categories are not mutually exclusive; a health problem may bring about a socio-economic problem. However, no effort will be made to trace or designate cause and effect. The categories are used simply for the sake of convenience and because they help to distinguish the nature of the problems.

General health problems include poor food habits or poor health

[5] In only three instances medical care was secured through the assistance of the nurse.

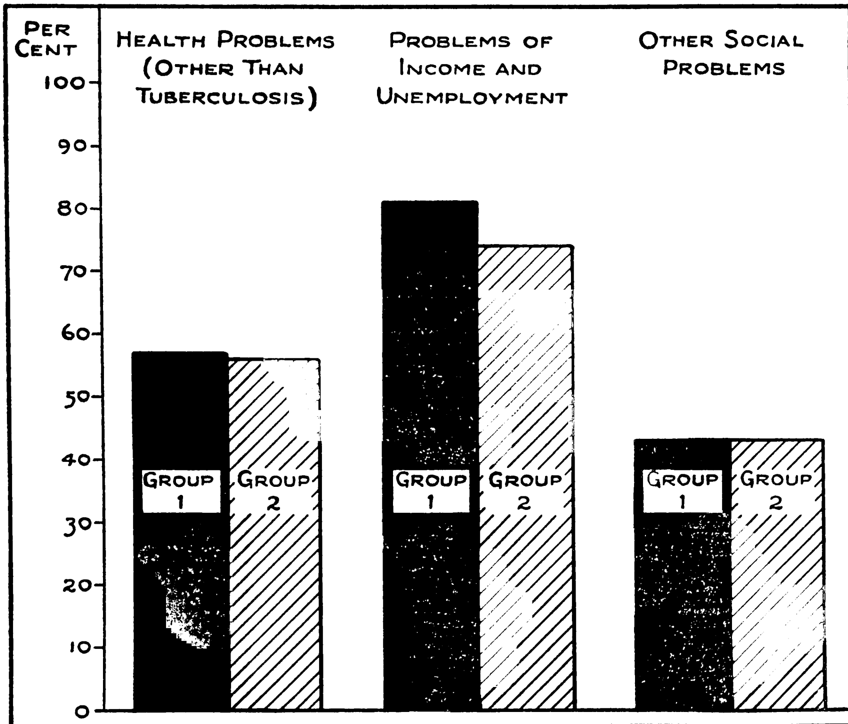

Fig. 1. Proportion of families in which there were socio-economic problems.

habits; the need for examination at a venereal disease clinic for contacts of a syphilis case; the need of hospital care, both temporary and custodial, for chronic-disease patients (nontuberculous); the need for dental care or eye care; medical supervision of prenatal cases; and the need for surgical care for acute conditions.

Economic problems are entirely those of inadequate income and unemployment.

Social problems include housing, such as inadequate living space or crowding, violations of the housing regulations, and poor housekeeping; inadequate supervision of the children in the family due to illness of the mother or to her employment outside the home; personality difficulties, such as emotional instability and behavior problems; and problems arising from unwanted illegitimate children.

Figure 1 shows the proportion of families in the two groups which had problems in the categories which have been described. It is strikingly apparent that inadequate income and unemployment were the most frequent problems in both groups of families. From 75 to 80 per cent had such problems.[6] General health problems were recorded for 57 per cent of the families and social problems were noted by the nurses in 43 per cent of the families. It is of interest that the proportion of families with problems in the two groups were generally similar for each classification of these problems.

Accomplishment With Respect to Family Problems

The next point of interest is, what were the nurses able to accomplish with respect to the problems which they had indicated as present in the family? Figure 2 shows for each classification of problems the proportion of families in which an improvement or complete solving of the problem was brought about during the period of observation. It is clearly apparent that the rate of accomplishment was much higher in families (Group 2) observed twelve months or longer. In 74 per cent of these families the economic situation was improved either through increased employment, where there was an unemployment problem, or through adjustment of the income to a more adequate level. Only 26 per cent of the families in Group 1, in which there was an economic problem, showed improvement. The rates of accomplishment in modifying health and social problems in the Group 2 families were 50 and 53 per 100 families compared with 37 and 28, respectively, in the families observed less than twelve months.

The differences in the accomplishment in the two groups of families suggest that the length of time of supervision is important. However, families in which supervision has been most successful tend to remain under supervision. The mean period of observation for the Group 1 families was five months, the shortest period one

[6] When first visited, 50 per cent of the families were receiving some form of public assistance.

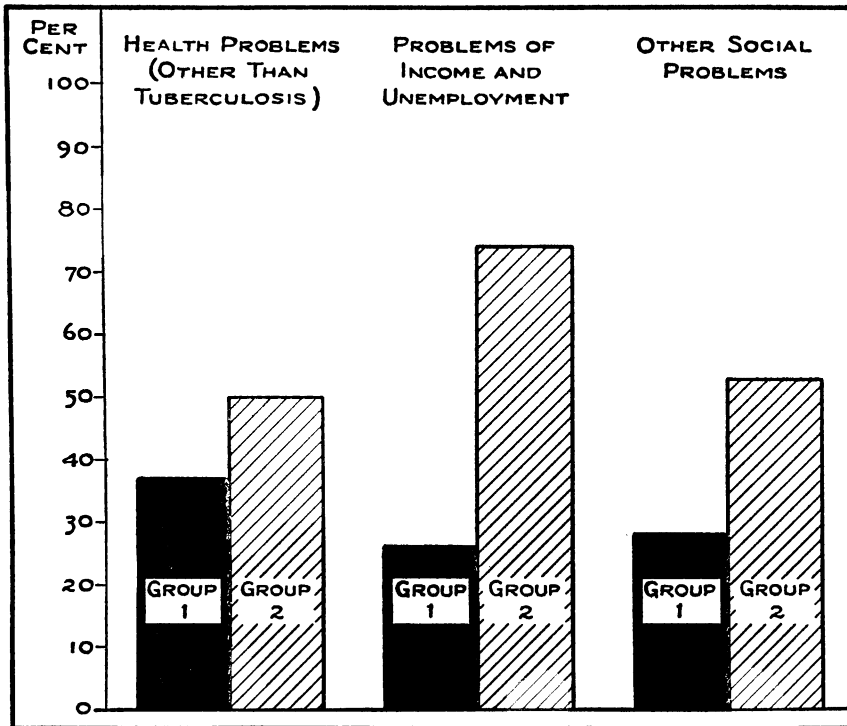

Fig. 2. Proportion of families in which there was definite accomplishment in solving their problems.

month, and the longest possible period of supervision was eleven months. In the 94 families in Group 2 the mean period of observation was eighteen months, and 27 per cent of the total number were observed twenty-three to twenty-four months. The families in Group 1 for the most part represent the families in which supervision ended, either because the family moved from the area of study or, in a few instances, was broken up because of tuberculosis and the members scattered to various parts of the City. It may be concluded that when tuberculosis occurs in the Negro families, prompt action by the health and welfare agencies is necessary to stabilize the family and to preserve its unity.

It is important to indicate more specifically how improvement in the family situation was brought about.

The Economic Situation. When the economic situation of the family at the beginning of the period of observation is considered, 50 per cent of all families were receiving some form of public assistance, chiefly home relief or work relief. At the end of the period of observation, 62 per cent of the families in Group 1 and 73 per cent of the families in Group 2 were receiving public assistance, or an increase of 24 and 46 per cent, respectively. The level of the income for all families is illustrated in Table 2, which shows the median annual income per adult cost unit according to the size of family. Size of family and income are expressed in adult cost units because this method allows for the relative cost of maintenance of children and adults. It is apparent that, in general, in both groups of families the median annual income per unit decreases as size of family increases. Comparison of the two groups of families by specific size is hardly appropriate because in some instances the number of families involved is exceedingly small. The important point brought out by this table is the level of the standard of living of these families as reflected by income. Standards of income for maintenance and for an emergency level of living have been worked out for families of the working class in New York

Table 2. Median annual income per adult cost unit in two groups of tuberculous families.

Size of Family in Adult Cost Units	Group 1		Group 2		Number of Families	
	Median Annual Income per Adult Cost Unit	Average Deviation from Median	Median Annual Income per Adult Cost Unit	Average Deviation from Median	Group 1	Group 2
1.00 or Less	$644	$125	$938	$280	4	6
1.40–2.74	413	124	350	129	21	38
2.75–3.99	332	209	294	71	17	[illegible]
4.00–6.49	167	38	305	112	3	[illegible]
6.50 and Over	*		182	22	1	[illegible]

* One family annual income per adult cost unit $288.

City.[7] In multiple-person-family units, with one exception, the median annual income was below the maintenance level of $390 per adult cost unit. The median incomes of the families studied were slightly above the emergency level of living, which was $279 per adult cost unit, except for those of relatively large size.

Examples of the adjustment of income which was made in families with the assistance of the nurse are as follows: Public assistance, that is, home relief, was secured for families where there was need for it; an additional allowance for food was secured for home relief families when the investigator from that agency felt that it was justified; clothing, blankets, and other household necessities were supplied by home relief when there was an unusual need for them. Families where the husband was ill or had died of tuberculosis were shifted from home relief to assistance from the Bureau of Child Welfare if there were a sufficient number of children under working age in the family to bring about an increase in income over that afforded by home relief. Table 3 shows the difference in the income levels for the different types of relief. It should be emphasized that

[7] The standards used were arrived at by the Research Division of the Works Progress Administration and were based on studies of the cost of living in March, 1935.*

These standards were based on a four-person manual worker's family, husband, wife, and two children of school age. These standards in terms of adult male units were: for maintenance $390 per unit per year (excluding rent $305), for emergency living $279 per unit per year, and excluding rent $194.

> At the maintenance level, these four persons live in a four or five-room house or apartment with water and sewer connections. Their dwelling is in at least a fair state of repair and contains an indoor bath and toilet for their exclusive use. They have gas, ice, electricity, and a small radio, but no automobile. They read a daily newspaper, go to the movies once a week, and enjoy other simple leisure-time activities. Their food is an adequate diet at minimum cost. They pay for their own medical care. Clothing, furniture, furnishings, and household equipment are provided with some regard for social as well as material needs. Carfare, taxes, and numerous incidental expenses are included in their budget.
>
> At the emergency level this four-person family has cheaper kinds of food to secure the same nutritive values as the maintenance budget provides. Housing is less desirable. There is less frequent replacement of clothing, furniture, furnishings, and household equipment. Household supplies are less plentiful; other services are reduced in quantity or eliminated entirely.

It is of interest to note that a more recent study of the cost of living has been made. In *The New York Times* of June 8, 1940, the Citizens Bureau of Governmental Research announced that the annual living cost of a four-person family of a manual worker in New York City averages $1,412. In the 1935 WPA study the average for the same type of family in New York City was $1,375.

* Stecker, Margaret Loomis: Intercity Differences in Costs of Living in March, 1935, 59 Cities. Works Progress Administration, Division of Social Research. Research Monograph xii, 1937.

Type of Public Assistance	Group 1		Group 2		Number of Families	
	Median Annual Income per Adult Cost Unit	Average Deviation from Median	Median Annual Income per Adult Cost Unit	Average Deviation from Median	Group 1	Group 2
Home Relief	$250	$123	$279	$ 89	18	30
Work Relief	377	25	308	127	3	9
Bureau of Child Welfare Aid	291	28	314	81	4	18
All Other Assistance	429	85	292	112	6	12

Table 3. Median annual income per adult cost unit in two groups of tuberculous families receiving public assistance.

the Home Relief Bureau has been cooperative in bringing about an adjustment of the economic situation of the family when their attention was called to it by the nurses. However, there is a limit to the amount of assistance that can be given by the Home Relief Bureau.

Emergency assistance was given by the Community Service Society, a private agency, to 50 per cent of the families observed twelve months or longer and to only 12 per cent of those observed less than twelve months. This assistance was temporary. For example, money for rent and food was supplied to some families until public assistance was secured for them; milk and cod-liver oil were supplied to families where the food budget could not possibly provide these necessities for the children; clothing was supplied in instances where there was an emergency situation. During the first two years of the study, the amount spent for these purposes was approximately $2,200. Such emergency assistance has played a part in the stabilization of the family which is so important in tuberculosis control.

General Health Problems. The accomplishments in solving the general health problems included improvement in food habits, dental care was secured where needed, clinic care of prenatal cases

was secured, and hospital and medical care were secured for chronic and acute illnesses where the need was greatest. There were also failures with respect to problems in all of these categories.

Social Problems. The only family problems in this group where there was progress in solving them were those of housing and inadequate supervision of the children. Violations in the housing regulations were brought to the attention of the landlord and were corrected; better living quarters were found for families where the crowding was greatest, and special attention was given to these conditions when the tuberculous patient was in the home. Improved supervision of the children of ill or working mothers was arranged through the assistance of a WPA housekeeper. Nothing was done about problems, such as personality difficulties, which included emotional instability and behavior problems, and which demand skilled social case-work treatment. They were recorded by the nurse but no social case-work agency was called in to assist. Some of these problems were especially serious because of their bearing upon family stability and health.

Problems Missed in the Tuberculous Families

So far the discussion of family problems has included those noted and recorded by the nurse. From the records it is possible to detect some which were missed and about which nothing was done. In the families supervised less than twelve months there were missed problems in one out of every three families and in those supervised twelve to twenty-four months, one out of every six or seven families had a problem which the nurse failed to note or to do anything about. Most of these were health problems which were revealed through hospital and clinic records contained in the family folder. Some were failures to check additions to the household, such as the return to the home of a patient from a mental institution, or the return of a tuberculous patient from the sanatorium, or failure to do anything about an apparent need for emergency assistance.

Problems Concerning the Tuberculous Patient and the Examination of Contacts

Patient Problems. The foregoing discussion has dealt with general health and socio-economic problems of the family. Since there were forty living index cases of tuberculosis in the fifty families in Group 1 at the time of the first visit to the family and seventy-two in the ninety-four families of Group 2, there were in some of these families problems which particularly concerned the tuberculous patient. These were in order of importance: need for hospitalization (a first admission or a readmission) and need for adequate rest and better diet. In the families observed twelve to twenty-four months (Group 2), 84 per cent of such problems were satisfactorily solved. In the fifty families with a relatively short period of supervision, only 32 per cent of the "patient problems" ceased to be problems before discharge of the family.

Examination of Family Contacts. Every effort was made to encourage all contacts in the families under supervision to have a clinic examination including an x-ray of the chest. Seventy-nine per cent of those in the families observed twelve to twenty-four months were examined, compared with 60 per cent in the families observed less than twelve months.

The solving of patient problems and the relatively high proportion of family contacts examined are achievements which merit some emphasis. From the data presented, it is evident that these problems and also problems of income were of major importance to the public health nurse in her supervision of the tuberculous families. However, the results shown in this study were accomplished with from eighteen to nineteen home and office visits per family per year.

The Secondary Attack Rate of Tuberculosis

One of the ultimate tests of the effectiveness of control procedures in tuberculous families is their effect upon the secondary attack rate

among those at special risk of contracting the disease. During the first two years of study the average annual attack rate in the 144 families has been 2.2 cases per 100 years of life. This rate is almost identical with the rate 2.3 per 100 noted during the first two years after exposure to tuberculosis in the Negro families studied by the Henry Phipps Institute in Philadelphia.[8] Whether or not we shall be able to modify the secondary attack rate in Harlem families as the study progresses is a question.

An important question raised by this report has been fittingly answered by Dr. Wade H. Frost. It seems suitable, therefore, to conclude with a quotation from an address of his:[9]

> How far the tuberculosis control program should extend in the direction of general social betterment is a question which, perhaps, need not be answered. Probably nothing has been more influential in bringing about the decline of tuberculosis than progressive improvement in the social order as a whole; and nothing, perhaps, is more essential to the further effective control of the disease than to hold up, and so far as possible to improve, the standards of living of the lower economic strata. Obviously, the tuberculosis control program cannot expand to include the whole scheme of social betterment; but it can, and I think it should, be concerned with raising the standards of living of those groups who are in most imminent danger of tuberculosis, beginning with the families of the tuberculous, and extending thence as far as practicable.
>
> As regards the families of persons suffering with open tuberculosis, I think a clear distinction should be made between the kind of public aid given them and that which is given generally to the poor who are disabled. For if we are to require the isolation of open tuberculosis as a matter of public protection, it becomes a public responsibility to bear not only the cost of medical care, but the whole cost to the patient's family, or as large a share as may be required. Moreover, it should be

[8] Putnam, Persis: Tuberculosis Incidence Among White Persons and Negroes Following Exposure to the Disease. *The American Journal of Hygiene,* November, 1936, 24, No. 3, pp. 536-551.

[9] Frost, Wade H.: How Much Control of Tuberculosis? *The American Journal of Public Health,* August, 1937, 27, pp. 759-766.

recognized that what is needed is not bare maintenance on a minimum or average "relief" standard, that it is not sufficient merely to prevent their dropping lower in the economic scale; it may often be necessary to raise them to a higher level. The two conditions which most favor tuberculosis are intimate exposure and poverty. Where these two meet is where double protection is needed, and it implies more than free medical care and hospital beds.