

A STUDY OF PUBLIC HEALTH NURSING SERVICE IN TUBERCULOUS FAMILIES IN THE MULBERRY DISTRICT OF NEW YORK CITY¹

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DURING recent years an increasing amount of interest in the evaluation of the work of the public health nurse has been evident. One of the important contributions to the study of the quality of public health nursing service made by the National Organization for Public Health Nursing was an attempt to formulate an objective method of rating of performance of service.² Significant studies of the work of the public health nurse have been made also by the Milbank Memorial Fund³ and the United States Public Health Service.⁴ All of these studies are in essence experiments directed toward evolving standards of measurement of nursing service, or an index of results which express quality of work as well as quantity. Yet quantitative standards alone are at present most widely used as a measure of the service rendered by the public health nurse even though it is generally recognized that quantity alone does not necessarily reveal quality.

A special study of tuberculosis conducted in the Mulberry district of New York City has afforded an unusual opportunity for objective study and evaluation of the nursing service in the tuberculous

¹ From the Mulberry Health Center, the Bureau of Tuberculosis of the New York City Department of Health, and the Milbank Memorial Fund.

² Tucker, Katherine and Hilbert, Hortense: SURVEY OF PUBLIC HEALTH NURSING ADMINISTRATION AND PRACTICE, 1934, pp. 192-221.

³ See articles by Randall, Marian G.: The Milbank Memorial Fund *Quarterly Bulletin*, July, 1931, ix, No. 3, pp. 103-118; October, 1932, x, No. 4, pp. 1-15. The Milbank Memorial Fund *Quarterly*, January, 1934, xii, No. 1, pp. 1-12; April, 1935, xiii, No. 2, pp. 1-16; July, 1935, xiii, No. 3, pp. 1-21; April, 1936, xiv, No. 2, pp. 163-172; July, 1937, xv, No. 3, pp. 275-291.

⁴ See articles by McIver, Pearl; Peterson, Rosalie I.; and Bean, Helen, respectively: *Public Health Reports*, United States Public Health Service, April 5, 1935, 50, pp. 469-480; September 20, 1935, 50, pp. 1293-1308; December 3, 1937, 49, pp. 1783-1793; December 31, 1937, 53, pp. 1923-1931; June 3, 1938, 22, pp. 913-921.

families. The data for a limited period of this special study are presented as another experiment in expressing quality of service in quantitative terms.

The special study of tuberculosis in the Mulberry district of New York City has been carried on for three years by the Mulberry Health Center of the Association for Improving the Condition of the Poor and by the Bureau of Tuberculosis of the New York City Department of Health. The Mulberry Health Center with its staff of seven field nurses under the direction of Miss Clara R. Price, R.N., represents the Department of Health in the field of tuberculosis home visiting, and the nurses are responsible for the public health nursing care of the tuberculous patients and their families in the district. The local tuberculosis clinic of the Department of Health, directed by Dr. A. A. Feller, is responsible for providing clinic and x-ray examination for patients referred by the staff of the Health Center.

The section of the City served by the Mulberry Health Center lies roughly between Broadway and the east side of the Bowery, extending from East Houston Street on the north to the north side of Canal Street. The chief characteristics of the neighborhood have been described in some detail in two previous publications.⁵ ⁶ Briefly stated, the families of the district, mainly of Italian birth or parentage, on the whole have a relatively low economic status and the majority of them are living in a generally unfavorable environment, judged by the degree of crowding and by conditions of housing.

When the special program was started in January, 1935, the following groups of families were selected for intensive service and study: all families in the district in which there was a known active

⁵ Downes, Jean and Price, Clara R.: Tuberculosis Control in the Mulberry District of New York City. *The Milbank Memorial Fund Quarterly*, October, 1937, xv, No. 4, pp. 319-347.

⁶ Burritt, Bailey B.: Social and Economic Problems in the Control of Tuberculosis. *The Milbank Memorial Fund Quarterly*, July, 1938, xvi, No. 3, pp. 287-293.

or arrested case of adult pulmonary tuberculosis were to be included and the new families in which cases in these categories were discovered were to be added during the period of special study; all families in which a death from tuberculosis had occurred during the period 1928-1934, but in which there were no known active cases January 1, 1935, were to be followed.⁷ All families in which there was evidence of primary infection in a child but no known active cases of adult pulmonary tuberculosis were to be carried, and an effort was to be made to locate the source of infection. Families related by blood or marriage to any of the above classes of tuberculous families were to be investigated for case finding to ascertain whether or not there had been spread of tuberculosis from one family to another. In addition, families in which there were individuals judged by the nurses as suspects were to be investigated.

DATA AND METHOD OF THE STUDY

To ascertain the effectiveness of a given procedure, such as public health nursing service, in the control of tuberculosis, it is necessary (1) to define the objective or objectives of the procedure in as precise terms as possible and (2) to test the accomplishment of the objective by comparison with the results of other procedures having the same objective or by comparison with suitable controls. This approaches the experimental or laboratory method of measurement and the application of this method to a complex social activity such as public health nursing service is difficult to achieve. However, it is possible to define the objectives of public health nursing service in tuberculous families.

From the point of view of the nursing administration, the chief objective in tuberculosis control is *service to the tuberculous family as a whole*. This chief objective includes other objectives, as follows:

⁷ The families in which a death had occurred during the period 1928-1934, but in which there were no known active cases January 1, 1935, in most instances were families which had been supervised by the Department of Health, and the group is not limited to cases known of only after a death from tuberculosis had occurred.

assistance in securing proper care and treatment for the tuberculous patient, assistance in securing the examination of the family contacts, general health supervision for all members of the family, attention to special problems (health or socio-economic) in the family. From the data of this study it is possible to test the effectiveness of *accomplishment* of only one of these objectives, namely, the examination of the family contacts.⁸ Nevertheless, the extent to which all of these objectives formed a part of the nursing program can be appraised, and such an appraisal provides one index of the value of the work in the Mulberry district.

In addition, volume of nursing service without reference to specific objectives of the service can be used for certain types of appraisal which are of some value from the point of view of nursing administration.

The data consist chiefly of records of the service rendered by seven nurses for a period of seven and one-half months during 1937. A daily time sheet was kept by each nurse upon which the amount of service and the amount of time were recorded for each visit during that day. For each visit, the name of the family which received the service was recorded and each individual in the family who received a service was listed. The type of service rendered to each individual also was entered on the record. The total amount of time spent on the visit was recorded by the nurse and the amount of time spent on each of the various services rendered during the visit was estimated and entered by her. When planning the day's visiting, the nurses were asked to record the main objective of each visit which they expected to make. It is believed that these data covering a period of seven and one-half months may be considered as a representative sample of the public health nursing service in tuberculous families in the Mulberry district during 1937. For certain parts of

⁸ The extent to which the examination of family contacts was secured was discussed in an earlier publication. Downes, Jean and Feller, A. A.: Clinic Service in the Control of Tuberculosis. *The Milbank Memorial Fund Quarterly*, October, 1938, xvi, No. 4, pp. 338-358.

the study, also, data of volume of services for the entire year are used.

APPRAISAL OF VOLUME OF NURSING SERVICE

During 1937 there were 856 families in the Mulberry district which were carried because of the special study of tuberculosis. The nursing service in the 856 families should be considered in relation to the tuberculosis problem in the family. The most striking way to indicate the relative importance of the tuberculosis problem in these families is to show the prevalence of active adult pulmonary tuberculosis during 1937 among the examined individuals in the families grouped according to the index case or the initial reason for going into the family. These data are presented in Table 1. The highest prevalence of active adult pulmonary tuberculosis was noted in the families supervised because of active tuberculosis or because of a death from pulmonary tuberculosis, where the rates were 12.6 and 5.2 per 100, respectively. In these families the rates of prevalence of active disease were from twenty-five to sixty times as high as the lowest rate, 0.2 per 100, observed in the 517 families where the index case was a child with primary infection. Three active cases were present during 1937 among members of the forty-six families selected for supervision because of a case of arrested pulmonary tuberculosis. Two of these were reactivated index cases formerly classed as arrested; the other was a secondary case in the family. The rate of prevalence of active disease among individuals in these families, 1.6 per 100, was similar to the rate, 1.3, noted in families where the index case was a blood relative of a tuberculous individual. In these two groups of families the rates were from six to eight times the lowest rate, 0.2 per 100, observed in the 517 families where the index case was a child with primary infection.⁹ It should be pointed out also that the families in the last three groups

⁹ Accurate data on prevalence of tuberculosis can be obtained only through examination of all members of the family. It is believed that the prevalence rates shown here and based upon the examined population are indicative of the differences in the amount of tuberculosis present in the various groups of families.

AGE GROUP	TOTAL POPULATION	TOTAL EXAMINED	DIAGNOSED CASES OF TUBERCULOSIS					
			Rate per 100			Number of Cases		
			Active Adult Pulmonary Tuberculosis	Arrested Adult Pulmonary Tuberculosis	Active Nonpulmonary Tuberculosis	Active Adult Pulmonary Tuberculosis	Arrested Adult Pulmonary Tuberculosis	Active Nonpulmonary Tuberculosis
51 FAMILIES - INDEX CASE - ACTIVE PULMONARY TUBERCULOSIS								
ALL AGES	236	175	12.6	6.8	1.1	22	12	2
0-9	34	27	0	0	3.7	0	0	1
10-19	54	48	10.4	2.1	0	5	1	0
20+	148	100	17.0	11.0	1.0	17	11	1
47 FAMILIES - INDEX CASE - DEATH FROM PULMONARY TUBERCULOSIS								
ALL AGES	217	134	5.2	5.2	0	7	7	0
0-9	17	15	0	0	0	0	0	0
10-19	70	58	3.4	5.2	0	2	3	0
20+	130	61	8.2	6.6	0	5	4	0
46 FAMILIES - INDEX CASE - ARRESTED PULMONARY TUBERCULOSIS								
ALL AGES	255	192	1.6	20.3	0.5	3	39	1
0-9	35	27	0	0	0	0	0	0
10-19	88	74	0	2.7	1.4	0	2	1
20+	132	91	3.3	40.7	0	3	37	0
517 FAMILIES - INDEX CASE - PRIMARY INFECTION IN A CHILD								
ALL AGES	3,205	1,813	0.2	0.9	0	4	16	0
0-9	652	508	0	0	0	0	0	0
10-19	1,188	909	0.1	0.2	0	1	2	0
20+	1,365	396	0.8	3.5	0	3	14	0
107 FAMILIES - INDEX CASE - BLOOD RELATIVE OF TUBERCULOUS FAMILY								
ALL AGES	481	225	1.3	0.9	0	3	2	0
0-9	110	62	0	0	0	0	0	0
10-19	97	68	1.5	0	0	1	0	0
20+	274	95	2.1	2.1	0	2	2	0
88 FAMILIES - INDEX CASE - HEALED NONPULMONARY AND SUSPECT TUBERCULOSIS								
ALL AGES	485	246	0.4	1.2	0	1	3	0
0-9	98	63	0	0	0	0	0	0
10-19	138	83	0	0	0	0	0	0
20+	249	100	1.0	3.0	0	1	3	0

Table 1. Prevalence of adult pulmonary tuberculosis and active nonpulmonary tuberculosis among examined individuals in 856 families classified according to the index case (in all groups of families the index case, if living, is included).

shown in the table were carried primarily for case finding. However, the prevalence of active disease affords clear evidence as to

CLASSIFICATION OF FAMILIES	NUMBER OF FAMILIES	MONTHS OF SERVICE	MONEY SPENT BY MULBERRY HEALTH CENTER	COST PER MONTH OF SERVICE PER FAMILY	COST PER FAMILY PER YEAR
TOTAL FAMILIES-ALL CLASSES	856	8,845	\$27,803.48	\$3.14	\$37.68
Index Case-Active Pulmonary Tuberculosis	51	493	2,947.17	5.98	71.76
Index Case-Death from Pulmonary Tuberculosis	47	465	2,335.49	5.02	60.24
Index Case-Arrested Pulmonary Tuberculosis	46	446	1,779.42	3.99	47.88
Index Case-Primary Infection in a Child	517	5,526	14,819.25	2.68	32.16
Index Case-Nonpulmonary Tuberculosis	21	182	444.86	2.44	29.28
Index Case-Blood Relative of Tuberculous Family	107	1,059	3,280.81	3.10	37.20
Index Case-Individual with Recent Attack of Acute Respiratory Disease	67	674	2,196.47	3.26	39.12

Table 2. Cost of service given by Mulberry Health Center to families classified according to the index case in the family—1937.

which groups of families needed the greatest emphasis in the tuberculosis nursing service.

The cost of intensive public health nursing service in tuberculous families in a congested area of a large city has been an important part of the special study of tuberculosis in the Mulberry district. Table 2, which shows the cost to Mulberry Health Center of their service and where it has been concentrated, indicates that service for the various groups of families cost from \$29.28 to \$71.76 per family per year during 1937.¹⁰ Families in which the problem of control of tuberculosis was centered received the greatest amount of service; namely, families carried because of an active case of

¹⁰ The population base used in the analysis of cost by family groups is expressed in units of time, instead of numbers of families; that is, a month of service for each family is the unit of time. Such a procedure eliminates the bias which would be introduced if individual families carried for various time periods were given equal weight. For example, the nursing visits per month of care per family give a more accurate picture of service than the average number of nursing visits per family, when some families may have been carried two months, three months, six months, or nine months, during the year.

adult pulmonary tuberculosis and those carried because of a death from pulmonary tuberculosis.¹¹

A previous study of the volume of service on the basis of cost for the families grouped according to the tuberculosis problem in them indicated that in 1936 the service had been too intensive in families where the problem was not acute and it was recommended that there be a shifting of emphasis in the program of tuberculosis nursing work.¹² By a comparison of the distribution of services among the different groups of families in 1937 with that in 1936, it is possible to see whether or not an effective effort was made to shift the emphasis in the program of nursing service.

Table 3 shows for 1936 and 1937 the percentage difference in the amounts of service given to each group of families compared with those carried because of a death from pulmonary tuberculosis. It can be readily seen that in 1936 all of the groups of families had more intensive service than did families in which the index case was a pulmonary death, these latter families where the need for intensive service, judged by the prevalence of active disease among their population, was relatively great. In 1937, however, only one group of families received more intensive service, namely, families in which the index case was active adult pulmonary tuberculosis. All other groups of families received in 1937 from 20 to 50 per cent less service than did those families in which the index case was a death from pulmonary tuberculosis. This comparison illustrates the importance of a critical appraisal of volume of services.

An indication of the amount of service given by the nurses to the families in the Mulberry district may be revealed also by the fre-

¹¹ The method of arriving at the amount of money spent on the various groups of families by Mulberry Health Center is as follows: 89 per cent of the money paid out for house, general, clerical, and statistical expenses was allocated to tuberculosis work in the 856 families. The entire expense of supervision and two-thirds of the cost of a nutritionist were allocated to tuberculosis.

Data of nurses' time were tabulated for the different groups of families. Money spent was allocated to families on the basis of the amount of time and service given to those families during the year.

¹² See footnote 5.

CLASSIFICATION OF FAMILIES	AMOUNT THE ANNUAL COST PER FAMILY IN EACH CLASS EXCEEDED OR FELL BELOW THE COST FOR FAMILIES IN WHICH INDEX CASE WAS A PULMONARY TB DEATH		PER CENT ABOVE OR BELOW	
	1936	1937	1936	1937
Index Case-Death from Pulmonary Tuberculosis				
Index Case-Active Pulmonary Tuberculosis	\$+26.76	\$+11.52	+72.9	+19.1
Index Case-Arrested Pulmonary Tuberculosis	+11.88	-12.36	+32.4	-20.5
Index Case-Primary Infection in a Child	+12.60	-28.08	+34.3	-46.6
Index Case-Nonpulmonary Tuberculosis	+ 9.72	-30.96	+26.5	-51.4
Index Case-Blood Relative of Tuberculous Family	+ 1.32	-23.04	+ 3.6	-38.2
Index Case-Individuals with Recent Attack of Acute Respiratory Disease	+ 6.84	-21.12	+18.6	-35.0

Table 3. Comparison of annual cost per family in the different groups with cost for families in which the index case was a pulmonary tuberculosis death.

quency of nursing visits. In 1937 the nurses made 7,260 visits contrasted with 7,405 visits in 1936. Less than 10 per cent of the visits in each year (8.7 in 1937 and 9.2 per cent in 1936) was classed as ineffective or "not-at-home" visits. Table 4 shows the number of nursing visits per family per year for 1937 and for 1936 based on months of service and number of visits in each year for the different groups of families classified according to the index case. Families in the various groups in 1937 received from 8 to 17 visits per year of service contrasted with from 10 to 16 visits per year of service during 1936. The average for all classes of families was 13 visits per year in 1936 compared with 10 visits per year in 1937. The change in emphasis in the program of nursing supervision again is clearly evident in this presentation of nursing visits. In 1937 from 2 to 4 fewer visits per family per year were made in families where there was need for decreasing the amount of supervision.

CLASSIFICATION OF FAMILIES	NUMBER OF MONTHS OF SERVICE	NUMBER OF VISITS MADE BY NURSES ¹	NUMBER OF NURSING VISITS PER MONTH OF SERVICE PER FAMILY	NUMBER OF VISITS PER FAMILY PER YEAR
TOTAL FAMILIES 1937	8,843	6,636	0.8	9.6
1936	6,289	6,727	1.1	13.2
Index Case-Active Pulmonary Tuberculosis				
1937	493	676	1.4	16.8
1936	391	516	1.3	15.6
Index Case-Death from Pulmonary Tuberculosis				
1937	465	530	1.1	13.2
1936	407	372	0.9	10.8
Index Case-Arrested Pulmonary Tuberculosis				
1937	446	434	1.0	12.0
1936	523	594	1.1	13.2
Index Case-Primary Infection in a Child				
1937	5,526	3,594	0.7	8.4
1936	3,686	4,072	1.1	13.2
Index Case-Nonpulmonary Tuberculosis				
1937	182	118	0.6	7.2
1936	161	169	1.0	12.0
Index Case-Blood Relative of Tuberculous Family				
1937	1,059	777	0.7	8.4
1936	778	662	0.9	10.8
Index Case-Individual with Recent Attack of Acute Respiratory Disease				
1937	627	513	0.8	9.6
1936	343	342	1.0	12.0

¹ Visits include home visits, office visits, and visits on behalf of patients; not-at-home visits are excluded.

Table 4. Number of visits per family made by the nurses in the Mulberry district during 1936 and 1937. (Families classified according to the index cases in the family.)

EXTENT TO WHICH THE OBJECTIVES OF PUBLIC HEALTH NURSING SERVICE IN TUBERCULOSIS WERE A PART OF THE NURSING PROGRAM

Since volume of nursing service alone cannot be considered as an entirely satisfactory measure of the quality of the work being done, data from special records of the services rendered by the nurses

during 1937 have been utilized in appraising the extent to which the main objectives of the nursing service in tuberculosis have formed a part of the nursing program. As was stated before, it is assumed that the family will be considered as a unit and that all members of the family will receive some form of public health nursing service. The examination of the family contacts, the general health supervision of all members of the tuberculous family, and attention to special health and socio-economic problems in the family should be included in the nursing service.

The extent to which all members of the family received some form of public health nursing service is shown in Table 5. The families are classified according to the type of index case in the

Table 5. Population in 856 families classified according to type of index case and the per cent of individuals receiving no nursing service during 1937.

AGE GROUP	51 FAMILIES INDEX CASE- ACTIVE PULMO- NARY TUBER- CULOSIS	47 FAMILIES INDEX CASE- DEATH FROM PULMO- NARY TUBER- CULOSIS	46 FAMILIES INDEX CASE- ARRESTED PULMO- NARY TUBER- CULOSIS	517 FAMILIES INDEX CASE- PRIMARY INFEC- TION IN A CHILD	21 FAMILIES INDEX CASE- NONPUL- MONARY TUBER- CULOSIS	107 FAMILIES INDEX CASE- BLOOD RELATIVE OF TUBER- CULOUS INDI- VIDUAL	67 FAMILIES INDEX CASE- IND. WITH RECENT ATTACK OF ACUTE RESPIRA- TORY DISEASE
TOTAL POPULATION	236	217	255	3,205	148	481	337
0-19 Years	88	87	123	1,840	78	207	158
20 Years and Over	148	130	132	1,365	70	274	179
INDIVIDUAL GIVEN NO SERVICE DURING 1937							
TOTAL	12	20	35	578	18	107	71
0-19 Years	6	8	16	278	9	37	26
20 Years and Over	6	12	19	300	9	70	45
PER CENT GIVEN NO SERVICE DURING 1937							
TOTAL	5.1	9.2	13.7	18.0	12.2	22.2	21.1
0-19 Years	6.8	9.2	13.0	15.1	11.5	17.9	16.5
20 Years and Over	4.1	9.2	14.4	22.0	12.9	25.5	25.1

family and the total population for each group of families and the number given no service are shown by broad age groups. From 5 to 14 per cent of the individuals in the families presenting the more important tuberculosis problems received no service from the nurse during 1937; namely, families in which the index case was active adult pulmonary tuberculosis, or was a death from pulmonary tuberculosis, or was an arrested case of adult pulmonary tuberculosis. It should be pointed out, however, that in the families where the need for service to all members was greatest, those with active tuberculosis, only 5 per cent of the total members of these families received no service. In the groups of families where case finding was a primary objective, from 18 to 22 per cent of the members of the family received no service. These data indicate that the nurses in the Mulberry district considered the family as a unit and that emphasis was placed upon those families most in need of their services.

Nursing Services in Relation to Objective of Visit. It is of considerable interest to examine the objectives of the visits made to the various groups of families.¹⁸ For each group of families the percentage distribution of visits according to the main objective is shown in Table 6. In families where the index case was active adult pulmonary tuberculosis the main purpose of the nursing visit was either to give general health teaching, or to obtain the social and health history of the family or to urge a clinic examination for one or more members of the family; the per cent of the total visits with these objectives were 29.5, 22.8, and 14.9, respectively. Eight per cent of the visits were made for purposes of rendering some special tuberculosis service. The remaining visits, excluding those classed as "miscellaneous objectives," had as their chief purpose the rendering of some special service, such as advice concerning prenatal or postpartum care, to urge dental care or to arrange country care, to

¹⁸ When planning the day's visiting, the nurses were asked to record the main objective of each visit which they expected to make.

MAIN OBJECTIVE OF HOME VISITS	51	47	46	517	21	107	67
	FAMILIES INDEX CASE- ACTIVE PULMO- NARY TUBER- CULOSIS	FAMILIES INDEX CASE- DEATH FROM PULMO- NARY TUBER- CULOSIS	FAMILIES INDEX CASE- ARRESTED PULMO- NARY TUBER- CULOSIS	FAMILIES INDEX CASE- PRIMARY INFEC- TION IN A CHILD	FAMILIES INDEX CASE- NONPUL- MONARY TUBER- CULOSIS	FAMILIES INDEX CASE- BLOOD RELATIVE OF TUBER- CULOUS INDI- VIDUAL	FAMILIES INDEX CASE- IND. WITH RECENT ATTACK OF ACUTE RESPIRA- TORY DISEASE
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
General Health In- struction	29.5	31.9	28.8	24.4	31.4	26.2	29.3
To Obtain Social and Health History	22.8	19.2	25.4	15.7	25.7	17.8	13.5
To Secure Clinic Exam- ination	14.9	18.4	10.7	16.5	20.0	17.2	16.3
For Special Tuber- culosis Service	8.3	13.5	8.5	4.7	0.0	6.3	12.0
Prenatal and Post- partum Service	1.0	0.8	0.6	5.3	0.0	7.8	0.5
Service Concerning Social Problems	2.6	2.6	2.2	1.4	2.8	1.2	5.8
To Urge Dental Care	0.7	0.0	0.0	1.6	0.0	0.9	1.4
To Arrange Country Care	2.0	0.0	0.6	3.3	0.0	1.9	2.4
Because of Special Nutrition Problem	0.3	0.0	0.6	1.9	0.0	0.3	0.0
To Investigate Re- ported Illness	1.6	2.6	1.7	3.4	5.7	3.1	3.8
Visit Requested by Family	1.6	0.8	4.5	3.7	2.9	5.3	1.9
Miscellaneous Objec- tives	14.7	10.2	16.4	18.1	11.5	12.0	13.1

Table 6. Distribution of main objectives of nursing home visits in 856 families classified according to type of index case in the family. (May 15-December 31, 1937.)

give attention to a special nutrition problem or to a social problem, to investigate reported illness or to make a visit requested by the family. The proportion of visits in these classes varied from less than one per cent to 2.6 per cent.

In the other groups of families the distribution of the visits according to objectives was in each instance generally similar to that noted for families where the index case was active pulmonary

tuberculosis. The conclusion may be drawn, therefore, that a relatively uniform program of nursing service was rendered to all of the families carried by the Health Center even though the tuberculosis problem was not the same in all and service was more intensive in some families than in others.

Since a uniform program of nursing service, judged by the objective of the visits, prevailed in all of the groups of families studied, it seems proper to combine the 856 families into one group and to examine the services rendered on the visits classified according to the chief objective of the visit. These data are shown in Table 7. When general health instruction was the main objective of the visit, the services given by the nurse were mainly general health instruction (34 per cent) and urging a clinic examination (35 per cent). Other services, including references for a special clinic examination (other than for tuberculosis) or medical care, discussion of clinical or medical findings with the patient, teaching precautions against tuberculosis, advice concerning hospital care, advice concerning special nutrition problems, advice concerning financial and social problems, arranging for dental care and for country care, advice concerning prenatal or postpartum care, ranged from less than one per cent to 5 per cent of the total services rendered.

In general there was a relationship between the objective of the visit and the service rendered on that visit. For example, when the chief objective of the visit was to secure a clinic examination of one or more members of the family, 62 per cent of the services rendered by the nurse was classed as "urging a clinic examination;" when the chief objective of the visit was advice concerning prenatal or postpartum service, 15.5 per cent of the services fell into that class and 29 per cent was classed as referrals to a special clinic for prenatal or postpartum examination. Securing a clinic examination for tuberculosis was the dominant type of service rendered regardless of the objective of the visit. However, no matter what the objective of the visit was, a variety of services was rendered. This

CLASSIFICATION OF SERVICES	MAIN OBJECTIVES OF VISITS					
	General Health Instruction	Obtain Social and Health History	To Secure Clinic Examination	For Special Tuberculosis Service	Prenatal and Postpartum Service	Service Concerning Social Problem
	PER CENT					
TOTAL SERVICES TO INDIV.	100.0	100.0	100.0	100.0	100.0	100.0
Refer for Clinic Exam. for Tuberculosis	35.1	46.9	61.6	30.5	12.3	30.0
Refer for Special Clinic Exam. or Med. Care	5.2	7.1	6.6	4.4	28.7	10.7
Discussed Clinic or Med. Findings with Patient	4.6	4.3	3.9	19.1	5.2	4.9
General Health Instruction	34.2	17.1	14.1	16.6	13.5	21.4
Teaching Precautions Against Tuberculosis	1.4	0.7	1.5	7.5	4.6	1.0
Advise and Arrange Hospital Care	0.5	0.5	0.4	2.3	0.3	0
Advise Concerning Special Nutrition Problem	3.8	3.3	2.5	8.2	4.9	1.0
Discussed Case with Physician	0	0.1	0	0.2	0	0
Advise re. Financial and Social Problems	5.8	5.8	3.5	2.6	2.3	25.2
Arrange for Dental Care	3.4	3.6	1.5	1.6	6.3	1.0
Arrange for Country Care	3.2	1.8	0.6	1.2	5.3	1.9
Advise re. Prenatal and Postpartum Care	0.3	0.5	0.2	0	15.5	0
Health and Social History	2.3	7.5	2.6	1.9	1.1	1.9
Miscellaneous Services	0.2	0.8	1.0	3.9	0	1.0

Table 7. Distribution of nursing services classified according to main objective of nursing visit (856 families). (May 15-December 31, 1937.)

fact may be interpreted as an indication that the nurse gave attention to the special family problems which she noted at the time of the visit.

Nursing Services in Relation to Time Spent and to Age. It is of considerable interest to examine the nursing services rendered to individuals in the different groups of families and their distribution related to the time spent. Table 8 shows these data for the

CLASSIFICATION OF SERVICES TO INDIVIDUALS AND TIME SPENT	FAMILIES	FAMILIES	FAMILIES	FAMILIES	FAMILIES	FAMILIES	FAMILIES
	INDEX CASE- ACTIVE PULMONARY TUBERCULOSIS	INDEX CASE- DEATH FROM PULMONARY TUBERCULOSIS	INDEX CASE- ARRESTED PULMONARY TUBERCULOSIS	INDEX CASE- PRIMARY INFECTION IN A CHILD	INDEX CASE- NONPULMONARY TUBERCULOSIS	INDEX CASE- BLOOD RELATIVE OF TUBERCULOUS INDIVIDUAL	INDEX CASE- IND. WITH RECENT ATTACK OF ACUTE RESPIRATORY DISEASE
TOTAL SERVICES TO INDIVIDUALS	901	784	661	5,244	161	1,021	634
TOTAL TIME SPENT (HOURS)	171.5	150.3	103.0	734.1	22.4	168.2	111.3
	PERCENTAGE DISTRIBUTION						
Refer for Clinic Exam. (TB)	31.9	40.7	40.7	39.7	38.5	40.3	31.4
Time Spent	23.7	28.9	32.0	30.8	28.7	30.8	26.3
Refer for Special Clinic Exam. or Medical Care	3.7	3.4	8.9	10.8	14.3	9.3	10.6
Time Spent	2.9	3.5	7.6	11.7	13.7	8.7	9.6
Discussed Clinic or Medical Findings With Patient	11.2	8.8	4.7	4.8	3.7	7.0	6.4
Time Spent	12.2	9.7	5.2	6.0	4.9	8.2	7.0
General Health Instruction	25.1	25.2	23.0	17.7	21.1	18.3	24.4
Time Spent	25.7	29.9	26.3	20.7	31.0	20.5	30.4
Teaching Precautions Against Tuberculosis	3.4	4.2	2.0	0.9	1.2	2.4	1.3
Time Spent	4.9	9.7	3.0	1.3	0.4	3.4	1.1
Advise and Arrange Hospital Care	1.6	1.7	0.4	0.4	0.0	0.5	0.8
Time Spent	2.3	3.7	0.4	0.9	0.0	0.6	1.6
Advise Concerning Special Nutrition Problem	3.6	3.3	3.2	3.9	5.6	4.1	3.6
Time Spent	3.8	2.8	3.1	3.8	3.5	3.3	3.4
Discussed Case with Physician	0.4	0.0	0.0	0.1	0.0	0.0	0.2
Time Spent	1.4	0.0	0.0	0.2	0.0	0.0	0.4
Advise re. Financial and Social Problems	5.0	4.7	4.3	5.3	8.7	4.2	6.3
Time Spent	4.7	4.5	6.0	6.4	11.0	4.7	6.2
Arrange for Dental Care	3.7	1.4	4.2	5.9	3.1	3.0	3.2
Time Spent	1.8	1.0	3.4	5.1	2.6	2.8	2.3
Arrange for Country Care	2.8	1.1	1.8	4.2	1.2	2.1	3.5
Time Spent	2.3	0.8	1.7	3.8	0.8	1.6	2.8
Advise re. Prenatal and Postpartum Care	0.6	0.0	0.2	1.4	1.2	2.9	0.8
Time Spent	0.9	0.0	0.2	3.8	2.2	5.6	2.1
History and Social History	5.0	4.6	5.9	3.5	0.6	3.6	6.3
Time Spent	11.6	4.9	10.5	3.5	0.4	3.8	5.7
Miscellaneous Services	2.0	0.9	0.7	1.3	0.8	2.3	1.2
Time Spent	1.8	0.6	0.6	2.1	0.8	6.0	1.1

Table 8. Distribution of nursing services to individuals and estimated time spent on services in 856 families classified according to the index case in the family. (May 15-December 31, 1937.)

families classified according to the index case or the initial reason for visiting the family. From 55 to 65 per cent of the services in all of the groups of families were classed as either general health instruction or referrals for tuberculosis clinic examinations; from 50 to 60 per cent of the total visiting time was estimated as spent in rendering these particular services. Discussion of clinic or medical findings with the patient formed from 4 to 11 per cent of the nursing services. From 4 to 10 per cent of the services in the different groups of families were referrals to a special clinic or for special medical care.¹⁴

That other special problems in the family were recognized by the nurses is evident by the fact that services falling in the following categories were rendered to individuals in the various groups of families: advice and arrangements for hospital care, advice concerning a special nutrition problem,¹⁵ financial and social problems,¹⁶ arrangements for dental care and for country care, advice concerning prenatal and postpartum care. There are no criteria established to indicate the expected frequency of special problems in a group of families which should be given attention by the nurse nor are there criteria to indicate the amount of time the nurse should devote to rendering service or assistance to the family in solving special problems. However, it is clearly evident from the data shown in Table 8 that special problems in the family were noted by the nurse and it was estimated that from 13 to 24 per cent of the time spent on visits among families in the different groups was spent in giving services concerning such problems.

A question concerning the nursing services rendered to individuals in the various groups of families which may justly be asked is:

¹⁴ "Special clinics" include infant clinics, prenatal and maternity clinics, orthopedic clinic, cardiac clinic, venereal disease clinic, etc.

¹⁵ General instructions regarding the importance of proper diet are included as a part of "general health instruction." This category includes only special nutrition problems.

¹⁶ Social problems noted by the nurses included problems of employment or unemployment, the need for vocational guidance, behavior problems, poor housing conditions, and delinquency.

Were the services concentrated upon any particular age group? Table 9 shows for each group of families the distribution of the services according to the age of the individual served and the percentage distribution of the population of the families. For the most part members of the families of various ages received the services of the nurse. This is indicated by the fact that the age distribution of the services in the different groups of families follows the age dis-

Table 9. Distribution of nursing services according to age compared with the age distribution of the population in 856 families classified according to the index case in the family. (May 15-December 31, 1937.)

CLASSIFICATION OF FAMILIES	ALL AGES	AGE GROUPS				
		0-4	5-9	10-19	20-29	30 and Over
		PER CENT				
TOTAL FAMILIES-ALL CLASSES						
TOTAL NURSING SERVICES	100.0	7.7	13.7	31.3	14.0	33.3
Distribution of Population	100.0	6.2	13.2	33.5	16.0	31.1
Index Case-Death from Pulmonary Tuberculosis						
Distribution of Services	100.0	2.8	5.7	30.5	25.4	35.6
Distribution of Population	100.0	1.4	6.4	32.3	26.3	33.6
Index Case-Active Pulmonary Tuberculosis						
Distribution of Services	100.0	3.2	8.5	23.4	20.8	44.1
Distribution of Population	100.0	5.1	9.3	22.9	24.2	38.5
Index Case-Arrested Pulmonary Tuberculosis						
Distribution of Services	100.0	7.1	8.2	30.4	17.4	36.9
Distribution of Population	100.0	3.9	9.8	34.5	19.6	32.2
Index Case-Primary Infection in a Child						
Distribution of Services	100.0	7.8	17.1	36.3	7.4	31.4
Distribution of Population	100.0	5.8	14.6	37.1	12.1	30.4
Index Case-Nonpulmonary Tuberculosis						
Distribution of Services	100.0	6.6	15.6	26.9	16.2	34.7
Distribution of Population	100.0	6.1	14.2	32.4	20.3	27.0
Index Case-Blood Relative of Tuberculous Family						
Distribution of Services	100.0	16.7	12.1	15.3	31.6	24.3
Distribution of Population	100.0	11.8	11.0	20.2	27.8	29.2
Index Case-Individual with Recent Attack of Acute Respiratory Disease						
Distribution of Services	100.0	6.0	10.6	28.5	13.6	41.3
Distribution of Population	100.0	8.3	11.9	26.7	18.7	34.4

tribution of the population quite closely. In certain groups of families there was some tendency to concentrate services upon persons in certain age groups. For example, in families where the index case was a blood relative of a tuberculous family, 16.7 per cent of the services was given to individuals in the age group 0-4 and 11.8 per cent of the total population of these families consisted of children at those ages. On the other hand, in families where the index case was active adult pulmonary tuberculosis, a relatively high proportion of the total services rendered to individuals was given to those 30 years of age and over (44.1 per cent) while individuals at those ages formed 38.5 per cent of the total population. The important fact brought out by Table 9, however, is that the distribution of the services by age in all groups of families so nearly approximated the age distribution of the population of these families.

The recording of all nursing services given to the various families carried by the Mulberry Health Center makes it possible to express these services in terms of a rate. Table 10 shows for the different groups of families classified according to the index case the service

Table 10. Nursing service rate in families classified according to the index case in the family. (May 15-December 31, 1937.)

CLASSIFICATION OF FAMILIES	NURSING SERVICE RATE PER FAMILY PER MONTH OF CARE	MONTHS OF CARE	NUMBER OF NURSING SERVICES TO INDIVIDUALS AND TO FAMILY AS A WHOLE
Index Case-Active Adult Pulmonary Tuberculosis	3.4	330.5	1,136
Index Case-Death from Pulmonary Tuberculosis	3.0	326.5	982
Index Case-Arrested Pulmonary Tuberculosis	2.7	312.0	831
Index Case-Primary Infection in a Child	1.8	3,686.0	6,460
Index Case-Nonpulmonary Tuberculosis	1.6	129.5	205
Index Case-Blood Relative of Tuberculous Family	1.7	758.0	1,273
Index Case-Individual with Recent Attack of Acute Respiratory Disease	1.6	506.5	803

rate per family per month of care.¹⁷ It is clearly evident that families in which the index case was active adult pulmonary tuberculosis and those in which the index case was a death from pulmonary tuberculosis received the greatest number of services. These families received 3.4 and 3.0 services per family per month of care, respectively. Families in the other groups received from 20 to more than 50 per cent less services per month of care than did the two groups discussed above.¹⁸

CONCLUSIONS

In this study an analysis of volume of nursing service has been made in order to illustrate that volume of work without reference to quality can be made to serve a useful purpose for the administrator. Both amount of service on a cost basis and frequency of visits in families grouped according to the tuberculosis problem in them indicated that in 1937 an effective effort had been made to concentrate the nursing service upon families where the need was greatest.

The analysis of the nursing services rendered to the families indicated that the main objectives of the public health nursing program in tuberculosis were a part of the nursing program and were put into effect in the Mulberry district. There was evidence that the family was considered as a unit. In those families where the need for service was greatest, practically all members of the family received some service and the services rendered were not concentrated upon a particular age group. In the visits made by the nurses the greatest emphasis was placed upon securing a tuberculosis clinic examination and upon general health supervision of the family.

¹⁷ The population base used for obtaining a service rate is expressed in units of time, instead of numbers of families; that is, a month of service or care for each family is the unit of time.

¹⁸ It is believed that the difference in these service rates would have been even greater had it been possible to adjust the rates for differences as to size of family and as to age distribution of the population of the various family groups. For example, in the group of families where the index case was a child with primary infection the average number of individuals per family was 6.2 compared with an average of 4.6 individuals per family in the group where the index case was active adult pulmonary tuberculosis.

There was evidence, however, that in visits to the family the nurse noted and gave attention to special health problems and socio-economic problems in the family.

In conclusion it should be stated that the purpose of the special tuberculosis study in the Mulberry district has been to evolve a program for better control of the disease in a congested area of a large city. Nursing service forms an important part of the program for control and a critical evaluation of this service is essential in order to maintain an efficient and balanced program.