

A STUDY OF MOBILITY AMONG TUBERCULOUS HOUSEHOLDS IN UPPER HARLEM¹

SALLY PREAS AND JEAN DOWNES

THE mortality from tuberculosis among Negroes in New York City presents a serious problem. A tuberculosis mortality rate for Negroes which in 1940² was more than five times the rate for white persons offers a definite challenge to those interested in the study and control of the disease. One important factor in the control of tuberculosis among Negroes is the stabilization of the family. It is apparent that the movement of persons in and out of tuberculous households may increase the risk of the spread of tuberculosis and may make difficult or impossible adequate follow-up work of cases and contacts. The objective of this paper is to describe the flow of population through a group of Negro tuberculous households because of its definite relationship to the problem of control of the disease among them and its probable relationship to the spread of tuberculosis in the Negro community.

DATA AND METHOD OF STUDY

The source of the material for this report was the special study for the control of tuberculosis among Negroes started April 1, 1939, by the Community Service Society, the Bureau of Tuberculosis of the Department of Health, and the Milbank Memorial Fund. The special study was set up in an area (Health Area 8) of Upper Harlem comprised of some thirty-five city blocks. Thirty-one thousand Negroes in 8,700 household units live in this area.³ The

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

² The rate for white persons was 43 per 100,000; for Negroes and other colored 220 per 100,000. *From*: "Net Tuberculosis Mortality, 1940." New York Tuberculosis and Health Association.

³ *From*: Census Tract Data on Population and Housing, New York City, 1940. Bureau of the Census, U. S. Department of Commerce.

families of all active or recently active cases of tuberculosis in the area are being given intensive public health nursing and clinic supervision.

Detailed records concerning the social and economic condition of each family are being obtained. The families are visited by the public health nurse at least once a month for the first year in order to note any changes in these conditions. The data being collected have been described in more detail in a previous paper.* The information which was essential for the present report was the record of all changes occurring in the composition of the household together with data describing certain social, economic, and biological characteristics of the population.

The households included in this study of mobility constitute a cross-section of the total households in Health Area 8 which had nursing supervision. Only households which were under supervision at some time during the period, April 1, 1941 to March 31, 1942, were selected. The minimum period of observation was two months, and the maximum, three years—from April 1, 1939 to March 31, 1942. Households in which the tuberculous case responsible for bringing the members under supervision was a lodger were excluded. Only households in which the index case was a family member or a person related to some member of the family were considered. Also excluded was any household which came under supervision because of a move to that household of a person already present in the study. If a person under supervision moved into a home already under supervision, both households were studied, but no households were included which came under supervision as a result of a move of a person. If part of a family moved and set up its own establishment, the new unit was still included in this study; the persons who moved were considered as contributing to the experience of two different household units,

* Downes, Jean and Price, Clara R., R.N.: The Importance of Family Problems in the Control of Tuberculosis. *The Milbank Memorial Fund Quarterly*, January, 1942, xx, No. 1, pp. 7-22.

but their individual identities were retained for the purpose of relating all moves of the same person.

DESCRIPTION OF HOUSEHOLDS

In this paper the term "household" has been used to designate all persons dwelling in a home regardless of blood relationship. The term "family" has been reserved for the simple biological unit consisting of husband and wife with or without children, husband only and children, or wife only and children.

It has already been stated that each household was selected because of a case of active or recently active tuberculosis in a family member or related person. When the person with tuberculosis is the husband or wife, the stability of the family unit may be greatly affected by that person's disability, hospitalization, or death. In 44 per cent of the 266 study households the index case was either the husband or wife in the family. In the remaining households the index case was a son or daughter or other relative.

Since economic factors undoubtedly are of importance in in-

Table 1. Households classified according to sex and age of head of house—Upper Harlem area of New York.

AGE OF HEAD OF HOUSEHOLD	HEAD OF HOUSEHOLD MALE	HEAD OF HOUSEHOLD FEMALE	HEAD OF HOUSEHOLD MALE	HEAD OF HOUSEHOLD FEMALE
	Per Cent		Number	
TOTAL HOUSEHOLDS	100.0	100.0	170	96
20-24	3.0	3.2	5	3
25-29	6.6	8.4	11	8
30-34	16.9	10.5	28	10
35-39	18.7	21.0	31	20
40-44	19.9	17.9	33	17
45-49	15.1	15.8	25	15
50-54	10.8	11.6	18	11
55-59	4.8	4.2	8	4
60+	4.2	7.4	7	7
Unknown Age			4	1

fluencing family stability, it is necessary to give some description of the economic status of the group. An average annual income per adult cost unit was figured for each household unit.⁵ This average applied only to family members and to other relatives when they shared the family expenses. The rent paid by lodgers was added to the family income, but lodgers were not included in the adult cost units. The average was based on the entire period of observation rather than on a single visit. The median income for the 266 households was \$383 per adult cost unit per year. The lower quartile was \$277 and the upper, \$545. The median monthly rent paid was \$33. The quartile range for rent was \$10, that is, from \$30 to \$40. The monthly rent described here was not an average for the period studied, but the actual amount reported on the first visit.

The constitution of the household is of special interest in relation to the mobility of the unit itself or of its members. In 36 per cent of

Table 2. Households classified according to presence of husband and wife in the home¹—Upper Harlem area of New York.

STATUS OF HUSBAND AND WIFE ²	PER CENT	NUMBER OF HOUSEHOLDS
TOTAL HOUSEHOLDS	100.0	266
Both Husband and Wife Present	61.8	160
Husband Present, Wife Dead	2.7	7
Separated	0.8	2
In Institution ³	0.4	1
Wife Present, Husband Dead	15.4	40
Separated	16.9	44
Deserted	0.4	1
Divorced	0.8	2
In Institution ³	0.4	1
In Army	0.4	1
Head of House Single Individual		7

¹ A husband or wife in a hospital because of tuberculosis is counted as present in the household.

² Status of husband and wife as of the first visit to the household.

³ Other than for tuberculosis.

⁵ Income is expressed per adult cost unit (food cost unit) because this method allows for the relative cost of maintenance of children and adults.

the total households the head of the house at the time of the first visit to the home was female. Table 1 shows the age distribution of the heads of households according to sex. It is evident that the age distribution for female heads was similar to that for males. Approximately two-thirds of the females and slightly more than two-thirds of the males were between the ages of 30 and 49. There were relatively few heads of households in the older age groups (50 years and over).

In only 62 per cent of the households studied were both husband and wife a part of the family unit. This percentage included households in which a husband or wife was in a hospital or sanatorium for tuberculosis. Any person related to the family was counted as present in the home throughout his hospitalization for tuberculosis. Table 2 gives the explanation of the absence of either husband or wife. Death and separation appeared to be responsible for the majority of broken homes.

The absence of older persons was not limited to the heads of households. The age content of the household at the time of the nurse's first visit is shown in Table 3. Only 8 per cent of all households contained persons 60 years of age or older. Approximately

Table 3. Distribution of households according to age of members¹—Upper Harlem area of New York.

AGE CONTENT OF HOUSEHOLD	PER CENT	NUMBER OF HOUSEHOLDS
TOTAL HOUSEHOLDS	100.0	266
Adults Only	48.5	129
Adults 15-59 Years of Age Only	44.4	118
Adults 15-59 and 60 or More Years of Age	4.1	11
Adults and Children	51.5	137
Infants Only	3.0	8
Infants and Children 1-14	4.5	12
Children 1-14 Only	44.0	117
Total Households Containing Persons 60 Years of Age or Older	8.0	23

¹ Age of members as of the first visit to the household.

one-half the households consisted of adults, mainly between the ages of 15 and 59. Infants were present in about 8 per cent and children aged 1 to 14 were present in 49 per cent of the homes. In terms of the total persons observed at any time throughout the study period 3 per cent were less than one year of age, approximately 3 per cent were aged 60 or over, and 21 per cent were in the 1-14 age group. The largest proportion of the population consisted of middle-aged adults.

Another way of describing the constitution of the household is in terms of the family units included within the household unit. These data are shown in Table 4. At the time of the first visit to the home 19 per cent of the households contained more than one family unit as defined earlier in this paper. In 14 per cent of the total households there were related family units living together, but in the other 5 per cent there were one or more unrelated or lodger family units living in the home. The nonmultiple family households were mainly one-family households. Seven households, or 3 per cent of the total number, consisted of one individual living alone, and 6 per cent were classed as partner households. The partner households were composed of two or more persons who shared the same apartment, who may or may not have been related, but who did not constitute a family unit.

Table 4. Distribution of households according to type of family unit¹—Upper Harlem area of New York.

TYPE OF HOUSEHOLD UNIT	PER CENT	NUMBER OF HOUSEHOLDS
TOTAL HOUSEHOLDS	100.0	266
Multiple Family Households—Composed of:	18.8	50
Related Units	14.3	38
Unrelated Units	4.5	12
Nonmultiple Family Households—Composed of:	81.2	216
One-Person Household	2.6	7
Partner Household	5.7	15
One-Family Household	72.9	194

¹ Type of family unit as of first visit to the household.

The average size of household on the first visit was 4.2 persons. Figure 1 shows the percentage distribution of households according to size on the first and last visits of the study period. The average size of household at the last observation was 3.7 persons. Figure 1 indicates a decrease in the proportion of households of three, four, six, or more than six persons, and an increase in those of one, two, and five persons during the study period. These data reveal the presence of a changing population,

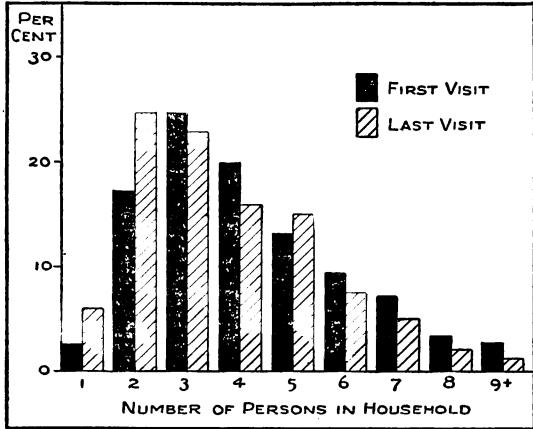


Fig. 1. Distribution of households according to size on the first and last visits of the study period.

but express only the balance of the changes. In order to discover the actual amount of mobility it is necessary to consider the incidence of moving during the study period.

INCIDENCE OF MOVING

Preliminary to any statement of rates of moving it is essential to define what constituted a move. In this study there were two types of moves under consideration, one the movement of an entire household unit and the other the movement of persons in and out of a household unit.

All moves of the entire household unit to another address, either within the study area, out of the study area, or back into the area subsequent to an earlier move out were counted as household moves, provided the unit was observed for at least two months. Any household unit moving out of the study area prior to the completion of two months' supervision was excluded from this study. Moves within the same apartment house were not counted as household moves.

Individual moves included all moves of persons in or out of the households included in the study, regardless of the length of time the persons were under observation; the only exceptions were persons hospitalized for tuberculosis and visitors.

A family member or relative in a tuberculosis hospital or sanatorium was regarded as present in the home. His admission to a hospital because of tuberculosis was not counted as a move unless it was def-

Table 5. Distribution of households according to number of moves of households—Upper Harlem area of New York.

NUMBER OF HOUSEHOLD MOVES	PER CENT	NUMBER OF HOUSEHOLDS
TOTAL HOUSEHOLDS	100.0	266
0	65.4	174
1	27.8	74
2	4.5	12
3	1.1	3
4	0.4	1
5	0	0
6	0.8	2

initely established that he would return to a different household upon discharge. A person who upon discharge did not return to the household where he was considered as present was treated as moving on the date of discharge from the hospital. Persons who entered or left the home on a visit were not considered as moving unless the visit was of unusually long duration.⁶

The average annual moving rate for household units was 29.9 per 100 observed. Table 5 presents the distribution of households according to the number of moves made by each. Sixty-five per cent of the total households remained in the same dwelling throughout the study period. Twenty-eight per cent moved once, and 5 per cent moved twice. Only 2 per cent moved three or more times. Apparently the moving rate for this sample of households was not influenced to any great extent by multiple moves of the same household.

The movement of persons through tuberculous households is

⁶ Examples of visitors who were counted as moving were one individual who entered a household on a visit and remained six months, another who remained nine months and was still "visiting" at the time of the last observation, and another who left for the Virgin Islands on a visit.

CLASSIFICATION OF MOVES	RATE PER 100 PERSONS PER YEAR	NUMBER OF MOVES	NUMBER OF PERSON-YEARS
Total Moves In	13.2	212	1,610
Total Moves Out	17.7	285	1,610
Moves In (Excluding Lodgers)	6.3	94	1,490
Moves Out (Excluding Lodgers)	11.3	168	1,490
Lodger Moves (In and Out)	195.8	235	120
Other Relatives (Moves In and Out)	46.6	122	262

Table 6. Rate of individual moves in and out of tuberculous households—Upper Harlem area of New York.

shown in Table 6. The total rate of moving in was thirteen moves per 100 persons per year. The rate of moving out was eighteen per 100 persons per year. The excess of “moves out” over “moves in” was increased when moves of lodgers were excluded — the rates were lowered to six and eleven, respectively. The total rate of moving in and moving out for lodgers was 196 per 100 persons per year. In other words, lodgers moved on the average twice a year. Persons who were related to the family but who were not members of the immediate family unit had a moving rate of forty-seven per 100 persons per year. Evidently family members were, on the average, the least mobile persons, other relatives were next, and lodgers were by far the most mobile.

Table 7. Average number of months of observation of households classified by type of unit¹—Upper Harlem area of New York.

TYPE OF HOUSEHOLD UNIT	MEAN NUMBER OF MONTHS OF OBSERVATION PER HOUSEHOLD	STANDARD DEVIATION	STANDARD ERROR OF MEAN	NUMBER OF HOUSEHOLDS
Simple Unit	18.3	10.94	±1.00	119
Simple Unit and Relatives	19.5	10.10	±1.06	90
Simple Unit and Lodgers	18.0	11.70	±2.14	30
Simple Unit and Other Relatives and Lodgers	16.2	7.44	±1.66	20

¹ Type of unit as of the first visit to the household.

In an effort to determine what kind of households presented the greatest risk of having persons move in and out, the households were grouped into four classes according to the composition of the household. The biological family unit, as defined previously, formed the basis of the classification. One-person households were excluded. Households were grouped according to whether at the time of the first visit they contained (1) the simple family unit only, (2) the simple family unit and "other relatives," (3) the simple unit and lodgers, and (4) the simple unit with both "other relatives" and lodgers. The four groups were considered to be fairly comparable with respect to the period of time the households were under supervision. The average number of months of observation per household for the four groups ranged only from sixteen to nineteen months. These data are shown in Table 7.

The rates of individual moves through the four groups of households are presented in Table 8. The moves include both entries and departures. The moving rates for the four groups showed a striking difference, varying from 19.4 per 100 persons per year for the simple biological unit to 78.2 for the most complex unit containing both "other relatives" and lodgers. Since the moving rate for lodgers was found to be far higher than that for family members and "other relatives," it is of interest to note what proportion of the

Table 8. Rate of individual moves in and out of tuberculous households classified according to type of unit¹—Upper Harlem area of New York.

TYPE OF HOUSEHOLD UNIT	RATE PER 100 PERSONS PER YEAR	TOTAL MOVES OF PERSONS	NUMBER OF PERSON- YEARS
Simple Unit	19.4	126	649
Simple Unit and Relatives	30.0	192	640
Simple Unit and Lodgers	41.6	77	185
Simple Unit and Other Relatives and Lodgers	78.2	97	124

¹ Type of unit as of first visit to the household.

moves were lodger moves. Table 9 indicates that for the units which contained no lodgers on the first visit, more than two-thirds of the moves were those of persons related to the family. For households containing lodgers but no "other relatives," 84 per cent of the total moves were lodger moves, and for households containing "other relatives" and lodgers, 72 per cent of the moves were made by lodgers. It is apparent that the most stable households were those containing no persons outside the simple biological family. The mobility of the members of the household was increased by the presence of "other relatives" and even more by the presence of lodgers in the home. The greatest mobility occurred when the home contained both "other relatives" and lodgers.

The question may arise as to how much the moving rates were affected by multiple moves of the same person. Table 10 shows that few persons in any group moved three or more times. The proportion of persons who moved once or twice during the period of observation was directly related to the complexity of the household unit. For example, in the simple family unit households, only 5 per cent

Table 9. Individual moves classified according to type of household unit¹—Upper Harlem area of New York.

TYPE OF HOUSEHOLD UNIT	TOTAL	MOVES OF RELATIVES	MOVES OF LODGERS
	PER CENT		
Simple Unit	100.0	70.6	29.4
Simple Unit and Other Relatives	100.0	69.8	30.2
Simple Unit and Lodgers	100.0	15.6	84.4
Simple Unit and Other Relatives and Lodgers	100.0	27.8	72.2
NUMBER OF INDIVIDUAL MOVES			
Simple Unit	126	89	37
Simple Unit and Other Relatives	192	134	58
Simple Unit and Lodgers	77	12	65
Simple Unit and Other Relatives and Lodgers	97	27	70

¹ Type of unit as of first visit to the household.

of persons moved twice, as compared with 15 per cent in the most complex group, households with "other relatives" and lodgers. Persons moving twice did have some weight in the group of households containing "other relatives" and lodgers. However, the moving rates seem to be influenced mainly by whether a person moved or did not move rather than by the number of times he moved. In terms of households, 62 per cent of those which had no moves in or out were simple units, 31 per cent contained "other relatives," 30 per cent lodgers, and 5 per cent "other relatives" and lodgers.

Even though the populations of some of the groups of households were relatively small in number, it is of interest to examine the moving rates by age. These data are presented in Table 11. In the two groups of households which contained no lodgers on the first visit, the moving rates for persons aged 15-29 were considerably in excess of the rates for all ages. It is important to note that all in-

Table 10. Distribution of persons according to number of moves and type of household unit—Upper Harlem area of New York.

CLASSIFICATION OF PERSON MOVES	SIMPLE UNIT	SIMPLE UNIT AND OTHER RELATIVES	SIMPLE UNIT AND LODGERS	SIMPLE UNIT AND OTHER RELATIVES AND LODGERS
TOTAL PERSONS	100.0	100.0	100.0	100.0
No Move	82.7	72.1	63.8	49.3
One Move	10.2	19.0	28.2	34.5
Two Moves	5.3	7.3	8.0	14.8
Three or More Moves	1.8	1.6		1.4
	NUMBER			
TOTAL PERSONS	450	491	174	142
No Move	372	354	111	70
One Move	46	93	49	49
Two Moves	24	36	14	21
Three or More Moves	8	8		2

dividual moves do not indicate family instability. It is to be expected that some persons will leave a household to establish one of their own and that others may move into a household as the result of marriage with a person in that home. It would be of value to determine how much of the moving described here might be considered excessive and how much "normal." However, it was not possible to obtain data on a control group for comparison or to obtain information on this group as to reasons for moving. Undoubtedly some proportion of the moving of persons, especially in the age group 15-29, is to be expected and cannot be interpreted as

Table 11. Rates of moving for persons in tuberculous households according to age and type of household unit—Upper Harlem area of New York.

AGE GROUPS	SIMPLE UNIT	SIMPLE UNIT AND OTHER RELATIVES	SIMPLE UNIT AND LODGERS	SIMPLE UNIT AND OTHER RELATIVES AND LODGERS
RATE PER 100 PERSONS PER YEAR				
ALL AGES	19.4	30.0	41.6	78.2
Under 15	12.1	16.5	19.4	63.6
15-29	35.1	50.6	37.7	124.2
30+	11.9	26.6	53.4	60.9
NUMBER OF MOVES				
ALL AGES	126	192	77	97
Under 15	21	32	7	14
15-29	73	87	23	41
30+	32	73	47	42
NUMBER OF PERSON-YEARS				
ALL AGES	649	640	185	124
Under 15	173	194	36	22
15-29	208	172	61	33
30+	268	274	88	69

evidence of family instability. For the group of households containing lodgers only, the highest rate occurred at ages 30 and over. It should be remembered that 84 per cent of the moves for all ages in this group were lodger moves. In households containing "other relatives" and lodgers, persons aged 15-29 moved on the average of slightly more than once a year. The populations were not large, but with the exception of the group composed of the simple unit and lodgers, the rate was consistently highest for persons aged 15-29.

The question may be raised as to whether the differences in the moving rates for the four groups of households were due to some factor which was associated with type of household. One such factor which may have been important was size of household. The average size of household at the time of the first visit was 3.6 for the simple unit, 4.7 if "other relatives" were present, 4.6 when lodgers were included, and 5.4 when the household contained both "other relatives" and lodgers. It is apparent that size of household was related to type of household, as it was described here. However, the fact of the somewhat higher moving rate for "other relatives" as compared with family members, and the strikingly higher rate for lodgers, seems to indicate that the relationship of the persons in the household may have been more important than simply the number present.

Economic factors might also be related to the type of household and the amount of moving. The median monthly rent at the time of the first visit was \$30 for simple units, \$35 for units with "other relatives," \$40 for units with lodgers, and \$40 for units with "other relatives" and lodgers. Evidently there was some relationship between rent and type and size of household. Obviously the presence of more persons may require a higher rent or the higher rent may necessitate the presence of more persons to help meet the cost.

Average annual income appeared to have less relationship to the moving rates for each type of household. The two groups of households which contained lodgers had a higher median income

per adult cost unit than those without lodgers. The simple unit had a higher median income than that for the unit including "other relatives." The median annual incomes per adult cost unit were \$368 for the simple unit, \$334 for the unit with "other relatives," \$438 for that with lodgers, and \$512 for that containing "other relatives" and lodgers. Apparently the status as to relief of the household was not associated with the amount of moving of persons. Relief was received by 70 per cent of the simple units, 61 per cent of the units with "other relatives," 67 per cent of those with lodgers, and 63 per cent of those with "other relatives" and lodgers.

Another factor which may be related to stability is the marital status of the head of the household. The percentage of heads of households who were either widowed, separated, or divorced was 29 for the simple unit, 40 for the unit containing "other relatives," 37 for that containing lodgers, and 40 for that containing both "other relatives" and lodgers. The smaller percentage of broken homes in the simple-unit households may have been a factor making for stability, but for the other three groups the difference in the percentage of broken homes does not vary directly with the amount of moving.

DISCUSSION

All the evidence seems to indicate that the type of household which experienced the least mobility was that composed of the simple biological family. This household was a relatively smaller one and paid on the average a lower rent than that which contained other persons. Households containing persons other than family members experienced a greater amount of moving through the household when the persons were lodgers than when they were related to the family, and the greatest amount when both "other relatives" and lodgers were present.

When it is considered that the households in question were selected because of an active or recently active case of tuberculosis,

85 per cent of which were known to be infectious, the movement of persons in and out of the home is of great significance. The importance of household contact in the spread of tuberculosis is well established. New cases of reinfection tuberculosis occurred among contacts in these families at the rate of 2.2 per 100 persons per year. Therefore, it seems probable that on the whole persons moving into a group of households selected as these, were exposed to an increased risk of tuberculosis, and that persons moving out offered an increased risk to the households into which they moved. It would be of interest to attempt to measure the risk to the community due to persons moving into and out of the tuberculous family, but the persons who are the most mobile are often extremely difficult to follow and supervise. To trace the lodger or person related to the family from one address to another and to persuade him to have a chest examination is not an easy task. The relatively long period between exposure to tuberculosis and the development of clinical symptoms adds to the difficulty of determining how much infection is spread by moving persons. However, in view of the high prevalence of tuberculosis among Negroes, the possibility that persons moving in and out of tuberculous households may contribute greatly to the spread of the disease should be taken note of even though the risk cannot be measured precisely.

The flow of population through Negro tuberculous households has other broad implications in relation to the problem of the control of the disease. The households which call for particular attention are those with "other relatives" and lodgers living in the home. The presence of persons outside the immediate family in the home often results from economic difficulties. The keeping of lodgers is a common way of supplementing income in Harlem. The need for special financial aid for tuberculous families has been emphasized before as a means of raising their level of living. The need becomes even more urgent in order to prevent additional risk to other members of the community. A "floating" population such

as the group observed here may be difficult to supervise, but emphasis can be placed on the tuberculous household, and efforts can be directed toward preventing persons from moving into the tuberculous household. Nursing supervision can be directed toward stabilizing the family unit, toward preventing the break-up of the home, especially when its existence is threatened by the death or illness of a member. Much remains to be done among Negro families, but if the tuberculous environment can be limited and properly supervised, we can hope for more positive results in the control of the disease among them.