Longitudinal Analyses of Four Years of Experience of a Prepaid Comprehensive Medical Care Plan[1]

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THE SPECTACULAR CONTRIBUTIONS OF SCIENCE TO medicine and the popularization of the results have greatly stimulated the demand on the part of the public for making modern medical benefits more readily accessible to a larger portion of the population.

But the very advances which have stimulated this demand and which have focused attention on the preventive aspects of disease have also contributed greatly to the cost of medical care. On the one hand, this increased cost has led to an enormous growth in the application of the insurance principle to prepayment for medical and hospital care; on the other, it has led to new approaches in the organization of medical practice to provide this care.

These changes in the methods of paying for and of providing medical care are comparative newcomers among American social institutions. Provision for prepayment of hospitalization began in 1933 with the establishment of Blue Cross plans. Prepayment of medical care is an even more recent phenomenon. Fewer than six persons per 1,000 held surgical and medical insurance in 1939. Today, according to the Health Information Foundation,[2] almost 70 per cent of the population is protected or "covered" by some combination of hospital, surgical, or medical insurance.

On the organizational side change has been less rapid, but there has been a steady growth in the number of group practice organizations. It has been estimated[3] that while in 1932 there were 239 medical groups

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with 1,466 physicians in the United States, by 1951 there were 600 such groups with over 5,000 physicians.

Growth in voluntary health insurance both in terms of people covered and in benefits offered will undoubtedly continue. New organizational patterns will continue to emerge. Unlike their predecessors, however, these new developments will be able to call upon a body of experience to guide them which was not available to most of the present voluntary prepayment plans for medical care at the time they were founded. The experience of one such plan—the Health Insurance Plan of Greater New York (HIP)—has been analyzed in the belief that it will be of value not only to HIP but also to administrators of other medical care plans, to welfare fund administrators, to public health officials, to community planners, to sociologists, and to the public in general, all of whom are interested in facts that bear on the problem of making the benefits of modern medical care available to the population.

The HIP experience will be presented in three parts: Part I, the present paper, deals with enrollment experience and sets forth data on the extent to which enrollees of different classes remain in the Plan and factors influencing continuance of their enrollment; Part II will present information on the number and kinds of physicians' services utilized by enrollees and how this utilization varies with length of coverage in the Plan; Part III will contain data on morbidity among enrollees of the Plan and will seek to develop measures of prevalence and incidence of various diagnoses as reflected in the operating records of HIP. These data represent the results of a "longitudinal" analysis of the first four years of operation in HIP—that is, they show the experience of the same group of individuals followed through four years of calendar time. They supplement material contained in a published report on the findings of a field survey inquiring into the health and medical care of HIP and New York City households[4] which was essentially a cross-sectional study depicting the situation at a particular point in time.

Description of the HIP Program

Since the meaning of the data to be presented cannot be properly assessed without an understanding of the organizational framework in which they have been collected, a brief description of the HIP program is in order.

HIP grew out of the late Mayor Fiorello LaGuardia's concern for the health of the employees of the City of New York and of their families. This concern extended not only to providing a means for meeting the costs of medical care but also to the kind of medical care to be provided. Mr. LaGuardia felt that such medical care should be comprehensive in coverage and should emphasize maintenance of health and prevention of illness.

With this philosophy as a guiding principle, the Health Insurance Plan of Greater New York began operation as a nonprofit corporation in March, 1947. It is generally classed as a "service" program which means that in return for the premium the enrollee is entitled to receive a variety of medical services. He receives no bills for these services, the premium paying the entire cost.[5] In this sense, once the premium is paid there are no additional costs for medical care in HIP. This contrasts with the "indemnity" type of program in which the enrollee is billed by the doctor and is indemnified in cash according to a fixed schedule of fees for those medical services covered in the contract. The indemnity received may or may not equal the amount of the physician's bill.[6]

The HIP contract makes available to the enrollee the following services in the home, physician's office, or hospital: general medical care; surgical, maternity, pediatric, and other specialist care; periodic health examinations; immunizations; laboratory and x-ray services; physical therapy; administration of blood and plasma; psychiatric consultations; visiting nurse services; and ambulance services.[7] There are no waiting periods for service and no limitations on the number of services or duration of medical care. Group enrollment is required, and, with few exceptions the employer pays at least half the premium directly or, in the case of union welfare funds, all of the premium is usually paid as a fringe benefit. A person losing coverage under the group contract is legally entitled to continue as an individual subscriber with a "policy in conversion."

Medical services are provided on a group-practice basis through medical groups distributed throughout New York City. The organization of these medical groups during the period of the present study is described in detail by Baehr.[8] The medical groups are paid on a per capita basis for each individual on their rolls, irrespective of the volume of service. The payment of the individual doctor in the medical groups is determined by each medical group.

Enrollment Experience

The present paper sets forth the extent to which HIP's enrollees have remained in the Plan during the four-year period 1948–1951 and examines some of the factors influencing retention of coverage in the Plan. From the economic standpoint it is desirable to have a picture of retention of membership in a medical care plan because (a) the plan may be embarrassed financially if its enrollee population tends to stay in the plan only during periods of need for extensive medical services, (b) estimates of personnel and facilities required under certain conditions and considerations of such social questions as that of health insurance of the aged require forecasts of future enrollment in the plan, and such forecasts require knowledge of attrition rates of various components of the population, and (c) a high rate of turnover results in higher operational costs.

Knowledge of retention of coverage is also of importance from the standpoint of health maintenance. If, as in HIP, one of the objectives of a plan is to maintain and protect the health of its enrollees, continuity in membership is essential to the achievement of this aim. Moreover, research on the impact of the plan on the health of its enrollees is hampered if survivorship in the plan is low, since follow-up studies become exceedingly difficult if not impossible.

In short, facts on retention of coverage by enrollees in a medical care plan are of importance from an administrative, medical, and sociological standpoint.

Methodology: Source of Data

The basic facts needed to study membership retention in a medical care plan are the date of entry to the plan and the date of leaving. These basic data are available for each enrollee in the Registrar Division of HIP. All changes in enrollment status are noted on the enrollee's file card. Also available for each enrollee are date of birth; sex; whether the enrollee is the subscriber in whose name the contract is made out, a spouse, or a dependent; whether the type of contract covers the family or only the subscriber; and the particular class of account to which the subscriber belongs. Thus, it is possible to examine the extent to which enrollees remain in the Plan in relation to each of these factors.

Nature of Sample

Analysis of retention of coverage in this report extends from January 1, 1948, to December 31, 1951. This period covers the first four full calendar years of HIP's existence. During these four years the enrollment advanced from 76,106 to 287,659. For the purpose of this study a ten per cent sample of all enrollees resident in New York City was chosen. Selection was made on the basis of all subscribers active at any time during the study period whose certificate number ended in a specified digit[9] and who entered the Plan before January 1, 1951. This closing date for entrants was chosen to provide at least one year of coverage for persons included in the study. Altogether the sample available for analysis consisted of 27,130 enrollees.[10] The distribution of these 27,130 persons by the basic variables of the study are shown in detail in Table 1 and Appendix Tables A1 and A2. However, of the 27,130 total persons, 11,928 were subscribers and 15,202 were dependents. In what follows the term "enrollees" refers to the entire group of 27,130 individuals but the term "subscribers" refers only to the 11,928 individuals in whose name the certificate or policy is issued.

TABLE 1
Percentage Distribution of Enrollees by Class of Account, Each Year of Entry

	Percentage of Enrollees				
		Year of Entry			
Class of Account	Total	1947	1948	1949	1950
All Accounts	100.0	100.0	100.0	100.0	100.0
New York City Accounts	86.4	89.3	76.3	93.7	75.7
Board of Education	16.9	41.6	17.2	3.8	11.6
Department of Sanitation	11.3	–	39.0	5.9	10.6
Board of Transportation	27.7	–	–	62.7	14.9
Other City Departments	30.5	47.7	20.2	21.3	38.7
Union and Trustee Accounts	5.4	4.9	16.4	1.8	2.4
Other Accounts	6.8	4.2	6.0	3.7	19.0
Conversions in Year of Entry[1]	1.4	1.6	1.3	0.8	2.9
Total Enrollees Entering	27,130	6,672	5,020	10,895	4,540

[1]For enrollees entering in 1947 these may be conversions either in 1947 or 1948. "Conversions" are individuals who have lost their group enrollment status and have elected to continue their coverage under an individual contract.

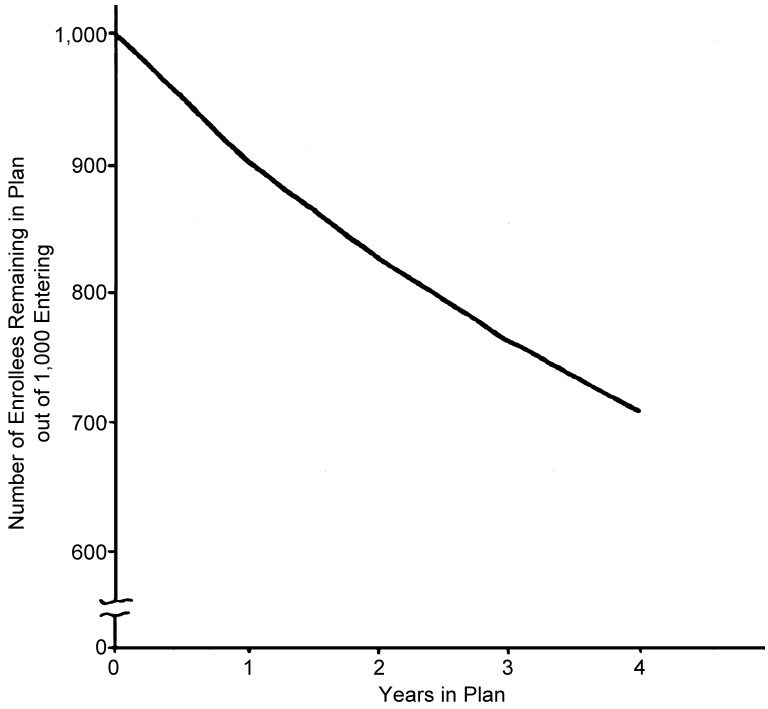


FIGURE 1. Retention of Coverage in HIP of All Enrollees

Calculation of Proportion of Persons Remaining in HIP a Stated Period of Time after Entry

The procedure for calculating the proportion of persons remaining in the Plan within a given period of time after enrollment is detailed in Appendix Table A3. This proportion is called the *retention rate* and may be thought of as the number of persons out of a thousand who remain in the Plan one, two, three, or four years following entry.

Findings: Overall Retention of Coverage

The experience in retaining coverage for the 27,130 enrollees as a whole is shown in Figure 1. The detailed data are presented in Appendix Table A4. The chart shows that, during the study period, the chances were that about 7 out of every 10 persons entering would still be in the Plan four years later. The curve is slightly convex to the horizontal axis suggesting that the greatest loss occurred during the first year in the Plan. This

suggestion is supported by examination of the proportions remaining at the end of each successive year among those present at the beginning of the year. These proportions are as follows:

Enrollment Year	Number of Persons out of 1,000 Present at Beginning of Year, Remaining at End of Year
1st	903
2nd	917
3rd	923
4th	928

In other words, if a person remains in HIP throughout the first year, the likelihood that he will leave in any one of the three subsequent years becomes progressively less, though the trend is not a very marked one.

The retention of coverage of the successive cohorts was not uniform (Figure 2, Appendix Table A4). Enrollees in the 1947 cohort showed the highest retention rates while those in the 1950 cohort had the lowest rates. About as many persons in the 1950 cohort were lost to the Plan by the end of two years as by the end of three years for the 1948 and 1949 cohorts.

In considering this variation in the experience of the several cohorts, it is important to bear in mind their composition in regard to class of account. This distribution is shown in Table 1. It can be seen that nearly 90 per cent of the 1947 cohort were employees of the City of New York and the largest single department was the Board of Education. In the 1950 cohort the category "Other Accounts" represented 19 per cent of the new enrollees although City departments still accounted for three fourths of the new enrollees.[11] The difference in the retention rates of the 1947 cohort and the 1950 cohort may therefore be a difference in the class of accounts or it may be due to a difference in type of coverage. Enrollees in City accounts are covered under family contracts but a substantial proportion of those in non-City accounts fall in a type known as "employee-only" accounts. The influence of the type of coverage and of the class of account on retention of membership in the Plan will, therefore, be examined next.

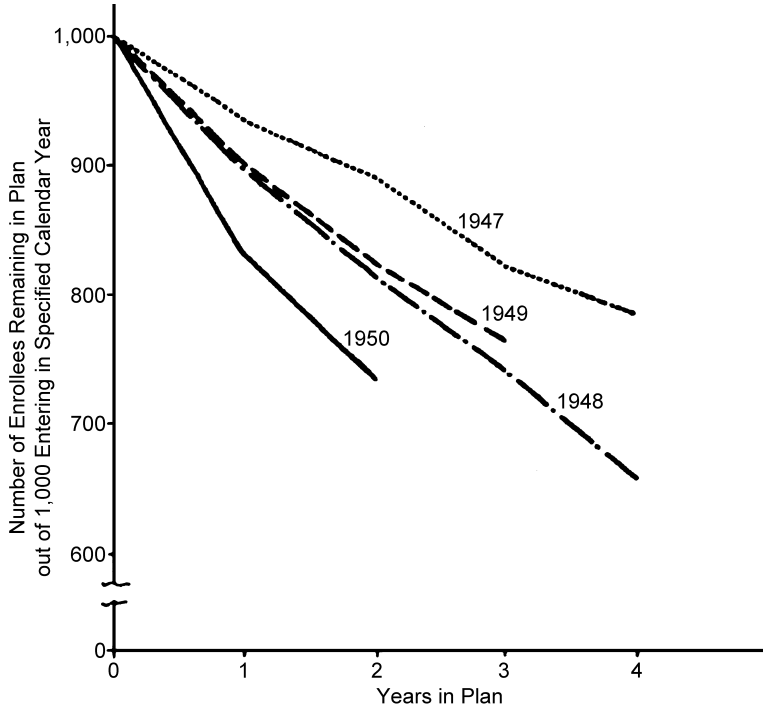


FIGURE 2. Retention of Coverage in HIP of All Enrollees, by Year of Entry

Retention of Membership by Type of Coverage and Class of Account

In general there are two broad classes of coverage provided by HIP contracts—those in which the subscriber covers himself and his family (family coverage) and those in which the subscriber is eligible to cover only himself (employee-only coverage). The HIP retention experience of persons covered under family contracts is very much better than that of those covered under employee-only contracts. (Figure 3 and Appendix Table A5.) This difference is observed in all of the cohorts. The enrollees under family contract are for the most part in City departments, while those under employee-only contract are covered predominantly in Union and Trustee accounts. All City departments have higher retention rates than either the Union and Trustee accounts or the category "Other Accounts," which is made up of small private employer contracts and housing projects. (Figure 4, Appendix Table A6.)

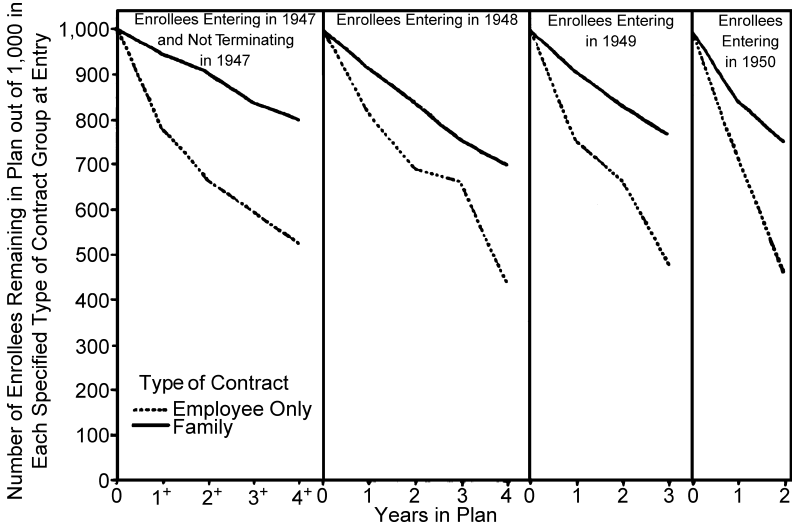


FIGURE 3. Retention of Coverage in HIP of All Enrollees, by Type of Contract and Year of Entry

In considering these differences, these facts must be borne in mind: (1) subscribers under City accounts pay only half the premium, the other half being paid for by the City; (2) subscribers under "Other" accounts in many instances pay the entire premium; (3) subscribers under Union and Trustee accounts for the most part pay none of the premium as individuals, the premium being paid for out of union welfare funds. Subscribers under City and commercial ("Other") accounts may decide as individuals to drop their coverage, but this individual decision is not open to subscribers of Union and Trustee Accounts since they remain covered as long as the union continues to pay the premium for its members.

Because loss of coverage by a subscriber in Union and Trustee accounts is a result either of death or of failure to remain eligible for coverage by the union welfare fund, the low retention rates in this category must be ascribed primarily to instability of employment,[12] and to a low rate of conversion to individual policies (*see* discussion on *Experience with Conversions*, on page 662). Retention rates for subscribers in "Other" accounts are poor under both family and employee-only type of contract. While instability of employment undoubtedly plays a role here also, an additional factor of importance in these accounts is the fact that many of the enrollees bear the entire cost of the premium as individuals.

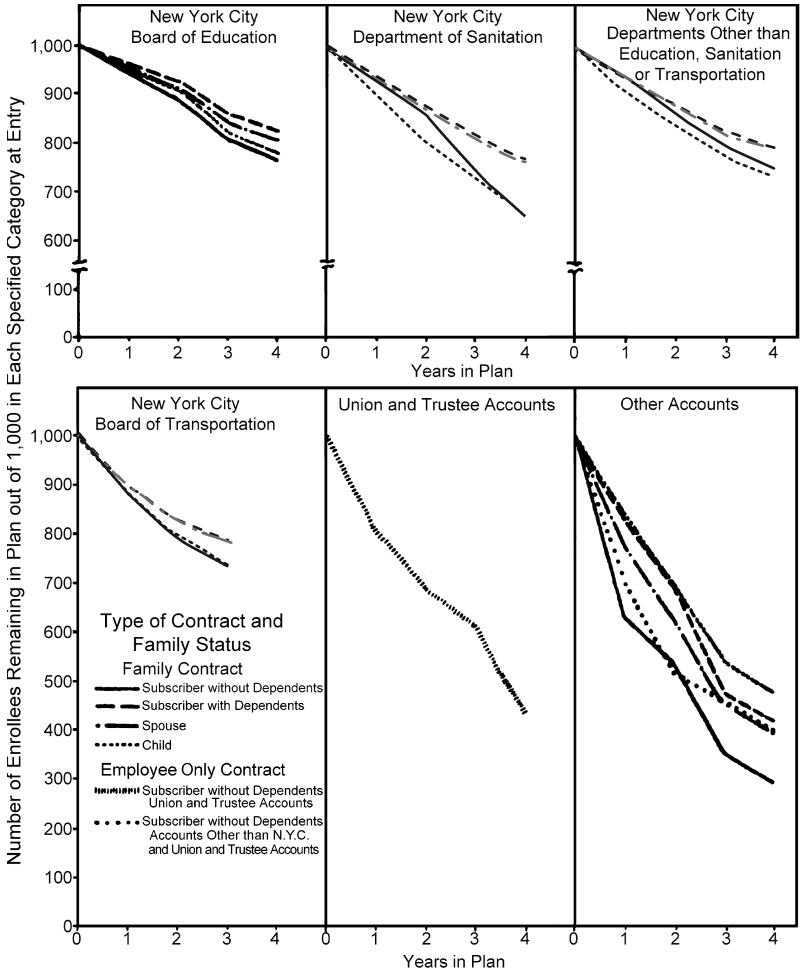


FIGURE 4. Retention of Coverage in HIP of All Enrollees, by Class of Account, Type of Contract, and Family Status

Study of the curves (Figure 4) for City accounts (all of which are family type of contract) shows that the existence of dependents is another important factor which influences retention of coverage in the Plan. The rate of retention is always higher for subscribers with dependents than for those without dependents. The same relationship exists between subscribers under family contract with and without dependents in the group of "Other" accounts.

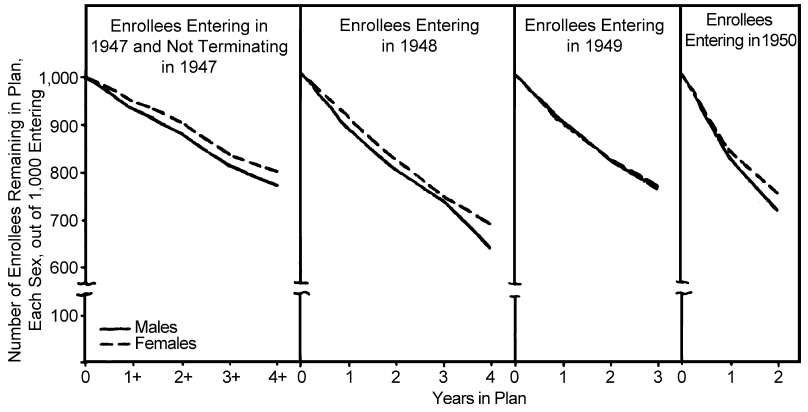


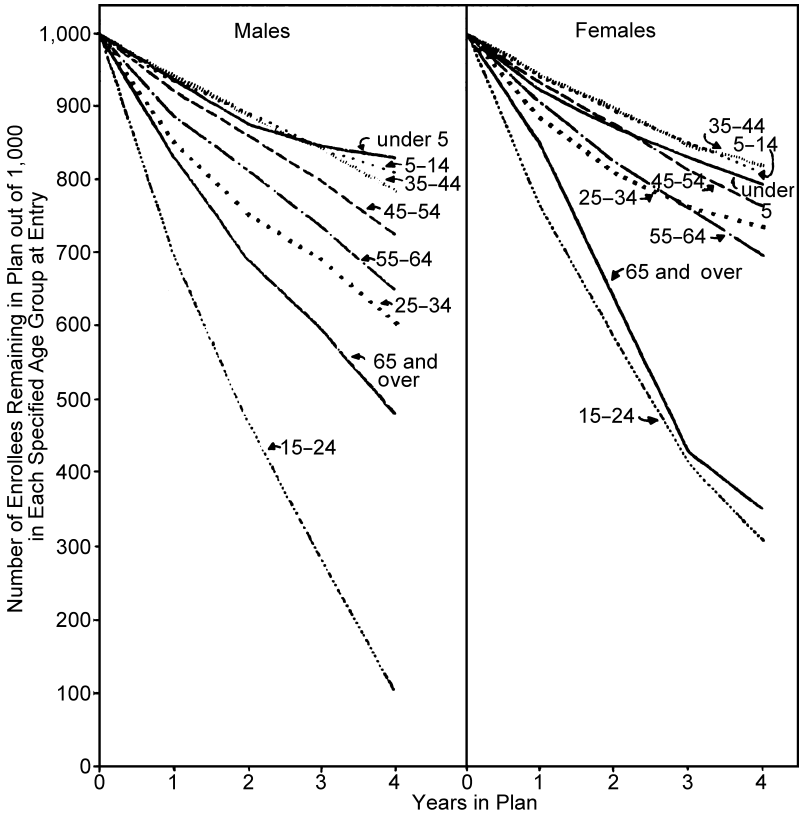
FIGURE 5. Retention of Coverage in HIP of All Enrollees, by Sex and Year of Entry

The factors just discussed probably play a major part in determining retention of subscribers in the Plan. In some instances anticipation of acquiring dependents, or psychological factors related to being associated with enrollees in the same accounts who have dependents, may also exercise an influence on retention of coverage. In addition, the higher retention rates for enrollees of the Board of Education than for employees of other City departments suggest the possibility that education may also be a factor in determining continuance of coverage in the Plan. One would have to examine education explicitly to determine this.

Retention of Coverage by Sex and Age

There is a slightly but consistently higher retention rate of females as compared with males (Figure 5, Appendix Table A7) in three out of four of the cohorts. Moreover, when the data are broken further by age as well as by sex (Figure 6, Appendix Table A8) the higher retention rate of females is more pronounced and is seen in every age group except 65 and over. In that age group the number of females on which the rates are based is quite small.

There is an apparently greater variability in the retention rates with age among the men than among the women. This greater variability, however, is largely due to the much lower rate of males in the age group 25–34 than of females in this age group. The spread of the rates in the



Note: For purposes of this computation, assumption has been made that cohorts entering both in 1947 and 1948 have been in Plan one year at end of 1948, two years at end of 1949, etc.

FIGURE 6. Retention of Coverage in HIP of All Enrollees, by Sex and Age at Entry

ages 35–64 is about the same in the two sexes, the female rates merely being at a higher level.

The lower retention rates of males reflect, in part, the fact that practically all of the enrollees in employee-only accounts are males and, as has been shown, this type of account is characterized by relatively poor retention of coverage.

When attention is focused on age as a factor in retention of coverage, it is seen that children under 15 of both sexes have a high retention rate as do both men and women in the age group 35–44. These two age groups accounted for nearly half (47.7 per cent) of all enrollees

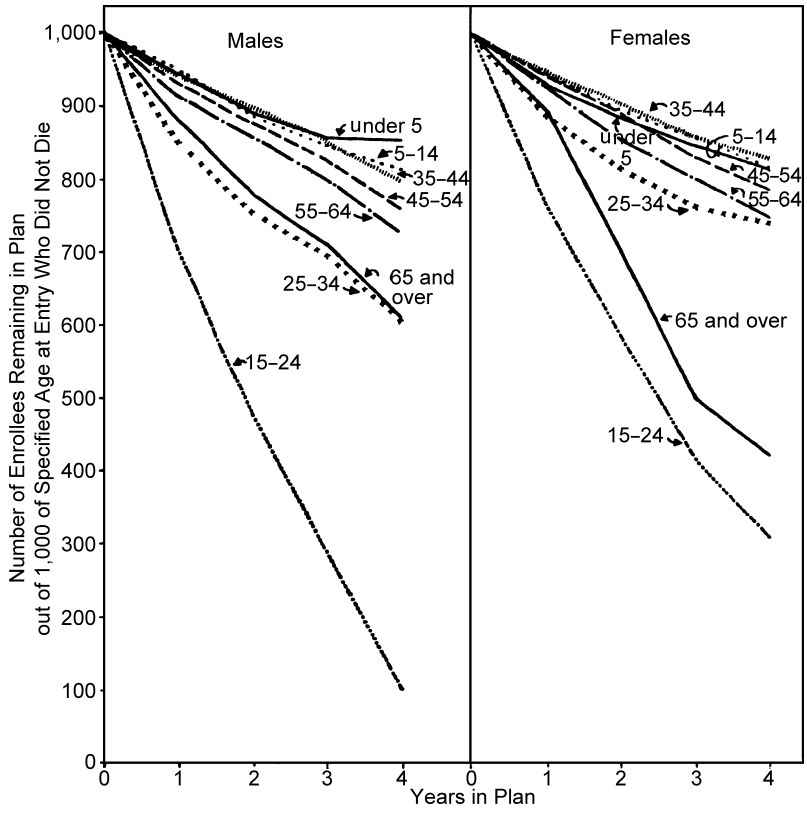


FIGURE 7. Estimated Retention of Coverage in HIP of Enrollees by Age and Sex, with Expected Deaths Excluded

with uninterrupted coverage who had entered HIP prior to January 1, 1951. Family responsibilities are great in the 35–44 age bracket and this undoubtedly is reflected in the high retention rate of this group.

Retention of coverage in HIP decreases successively in the three age groups 45–54, 55–64, and 65 and over. Of course, this is expected to some extent due to the increasing force of mortality. The retention rates, at the end of four years, for these three age groups in males are, respectively: 724, 647, and 480. When these rates are recomputed to exclude estimated losses from death,[13] the corresponding figures are: 757, 724, and 608. Similar, although slightly smaller, changes are effected in the retention rates for females of these ages through the exclusion of deaths. Exclusion of deaths has practically no effect on the retention rates between the

ages of 5 and 44. The HIP survivorship rates, with deaths excluded, are shown in Figure 7. (Appendix Table A8). Although exclusion of deaths raises the retention rates from age 45 on, there is still a decrease with advancing age but not as great as before. This trend may represent a combination of several factors. In the age group 65 and over, persons retire from covered employment and their retirement income may not be sufficient to permit them to pay the full premium themselves even though they have the privilege of doing so. As a result, the retention rate is low. Similar factors may operate, though with less force, in the age group 55–64 particularly in the Fire and Police Departments where early retirement is permitted.

It may also be that the trend toward lower HIP retention rates with advancing age reflects in part a greater likelihood of an older person having established medical contacts prior to entrance to HIP which he wishes to maintain.

Finally, it may be that in some instances the trend reflects the fact that the older a person is the more likely he is to have a chronic disease. If this chronic disease incapacitates him to the point of not being able to continue in his job, his income is sharply reduced, he cannot continue his premium payments and he loses his coverage in the Plan. It is not known to what extent this is so, but if the situation arises with any frequency it is a matter which should be of considerable concern to the community since such persons are very likely to become charges upon the community in one way or another. From the standpoint of the community planner it is clearly desirable to have more data on the magnitude of this problem.

The low retention rate of enrollees 15–24 represents a special situation. To meet Insurance Department regulations children who reach age 18 are no longer carried as dependents. Such an enrollee is said to have reached "maturity" and is no longer covered by the parent's enrollment. Like the enrollee 65 or over, the 18 year old may convert to individual coverage by paying the entire premium but this is an age when illness rates are low and the inducement to remain in the Plan is not great. Also some of these young persons may be attending schools which provide at least some medical services.

The lower retention rate of persons 25–34 in comparison with those 35–44 may be accounted for by a higher proportion of single persons and relatively lower incomes and illness rates in the younger group.

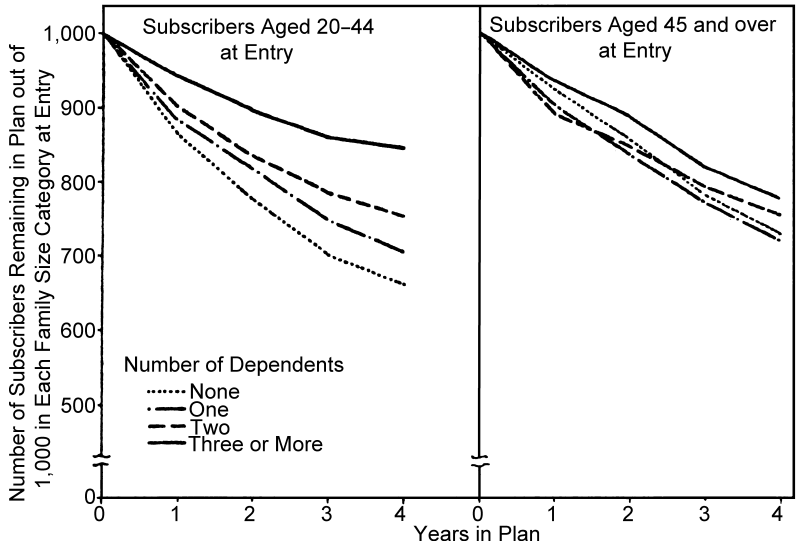


FIGURE 8. Retention of Coverage by HIP Subscribers under Family Contract by Age and by Number of Covered Dependents at Entry

Retention of Subscribers by Size of Covered Unit

In the previous discussion of retention of coverage and family status it was noted that subscribers with dependents have a better retention rate than those without dependents. In Figure 8 (Appendix Table A9) the retention of subscribers in family accounts is examined further in relation to the number of dependents covered.

It is clear that among the younger group of subscribers, the greater the number of dependents the more likely it is that the subscriber will remain in HIP throughout the four-year period. Thus among those with three or more dependents, 84.5 per cent were still in the Plan four years later. The corresponding figures for those with two, one, and zero dependents covered were 75.5, 70.4, and 66.0 per cent respectively. These variations in per cent retaining membership probably reflect similar variations by size of family in the need for obstetric and pediatric services.

In contrast to the experience of younger subscribers, the chance of a subscriber 45 years of age or older remaining in the Plan over the four year period varies very little in relation to the number of covered dependents. The highest retention rates are still observed among those with the greatest number of dependents, but the excess over that of

subscribers with fewer dependents is not nearly as marked as among subscribers 20–44 years old. It may be hypothesized that the pattern of retention of coverage in the Plan of the older subscriber is conditioned primarily by the needs of persons in his age group rather than by the medical care needs of other members of his family.

It has been previously noted that subscribers *without covered dependents* enrolled in family accounts are more likely to remain in the Plan than subscribers in employee-only contracts. A comparison of Figure 8 with Figure 4 shows this statement to be true regardless of whether the former group of subscribers is under or over 45 years of age. In other words, this difference between the class of subscribers without covered dependents apparently is not due to any influence of age on the survivorship pattern. It is more likely related to factors such as job stability or to the fact that the subscriber in the employee-only account may be subjected to the influence, implicit or explicit, of the members of his family who receive their medical care outside the Plan. Presumably the subscriber without dependents enrolled under the family contract is not exposed to these forces.

The patterns of retention of coverage in relation to the size of the covered unit which have just been discussed are essentially the same in each of the four cohorts classed by year of entry (Appendix Table A10) namely, that retention is greatest among subscribers with the greatest number of dependents. The variation in retention of coverage among the different cohorts is largely due to the different class of accounts entering in different years which has previously been discussed.

Experience with Conversions

At the present time initial enrollment in most medical care plans is largely on a group basis. However, persons leaving an enrollment group because of job change, retirement or similar reasons are permitted in some instances to convert their enrollment to an individual policy with more limited coverage. In HIP, all enrollees have the privilege of conversion to an individual policy with the same coverage as they previously had. Although the premium rate in HIP for such individual policies is only slightly higher than for the group policy, conversion for most enrollees usually means that they have to meet the entire premium themselves, including the portion formerly paid by an employer or by a union health and welfare fund.

TABLE 2
Enrollees Listed for Termination, and Per Cent Converting, by Type of Contract

Year	Family Coverage		Employee Only Coverage	
	Listed for Termination	Per Cent Converting	Listed for Termination	Per Cent Converting
1948	734	15.8	197	4.1
1949	1,444	17.7	188	4.8
1950	2,175	16.0	121	3.3
1951	1,779	25.4	336	1.8

Of the total persons in the Plan at the end of 1951, 3.5 per cent had converted to individual contracts. This low figure may suggest that conversions are of relatively little importance. However, the conversion privilege assumes a different significance when it is realized that through the conversion mechanism, the aged and other segments of the population faced with extraordinary health needs have an opportunity to remain insured. Accordingly, the conversion privilege may be of considerable importance to the individual, the medical care plan, and the community at large. It is for this reason that the following data are presented on the probability of converting and of retaining coverage after conversion.

Influence of Type of Contract on the Chance of Converting

The chance of converting among those initially enrolled under family contracts as compared with those originally enrolled under employee-only contracts is shown in Table 2. Clearly the former group are far more likely than the latter to exercise the conversion privilege if they are listed for termination. It seems reasonable to suppose that this reflects an anticipated need for medical care for dependents on the part of those originally enrolled under the family contract. However, other factors may also play some part in bringing about the observed differential in conversion rate. Initial enrollment conditions in the two types of coverage are quite different. Employee-only contracts were in large part those of unions which automatically covered their memberships and paid the entire premium. In the case of people with family coverage, however, individual decisions

TABLE 3
Subscribers Listed for Termination, Each Year, 1948–1951, Per Cent Converting, by Age and Sex

	Listed for Termination				Per Cent Converting			
Age and Sex	1948	1949	1950	1951	1948	1949	1950	1951
All Ages	485	726	988	1,031	10.5	14.3	13.5	15.6
Males	345	539	667	771	6.7	8.5	8.5	8.6
Females	140	187	321	260	20.0	31.0	23.7	36.5
20 to 44	259	399	615	628	13.5	15.1	16.3	19.1
Males	160	267	371	428	8.2	8.2	7.8	9.8
Females	99	132	244	200	21.2	32.6	26.2	39.0
45 to 64	171	271	302	308	6.4	10.0	9.9	7.8
Males	136	227	238	263	3.7	7.0	8.4	4.6
Females	35	44	64	45	*	25.0	15.6	26.7
65 and over	37	37	49	62	*	*	16.3	25.8
Males	35	32	46	55	*	*	17.4	21.8
Females	2	5	3	7	*	*	*	*

*Percentage not calculated; base less than 40.

had to be made to join HIP and the subscriber himself usually paid at least half the premium. This personal participation in the initial decision to enroll may account for a part of the difference in conversion rates. Another part may be due to a lower economic position of enrollees in employee-only accounts. In any event, as is detailed later, the presence of dependents in the family exercises an important influence on the chance of converting to individual contracts if the need arises.

Influence of Age and Sex on the Chance of Converting

Women subscribers are much more likely to convert than men subscribers when they are no longer eligible for group enrollment. (Table 3). The difference is greatest in the 20–44 age group although it is still large in the 45–65 age group. Part of the difference reflects the fact that there are more male employees in the employee-only type of contract but it is also likely that the high conversion rate of females in the young age group reflects a need for maternity and pediatric services in the family.

Finally, it must be remembered that a large proportion of female *subscribers* are employees of the Board of Education. The rules of the Board of Education may, therefore, influence the per cent converting. Teachers on maternity or sabbatical leave must convert or lose coverage for the duration of the leave. They may then return to group enrollment.

Though the numbers in the age group 65 and over are small the conversion rate in this group would appear to be high, probably reflecting a foreseen need for medical care.

Influence of Size of Family and Length of Coverage on the Chance of Converting

In family contracts, the subscriber with two dependents is more likely to maintain coverage in the Plan through conversion than the subscriber in smaller or larger families (Figure 9, Appendix Table A11). This appears to be true irrespective of the length of coverage. One would like to examine the data further by age as well as size of family but the material is too limited to permit this.

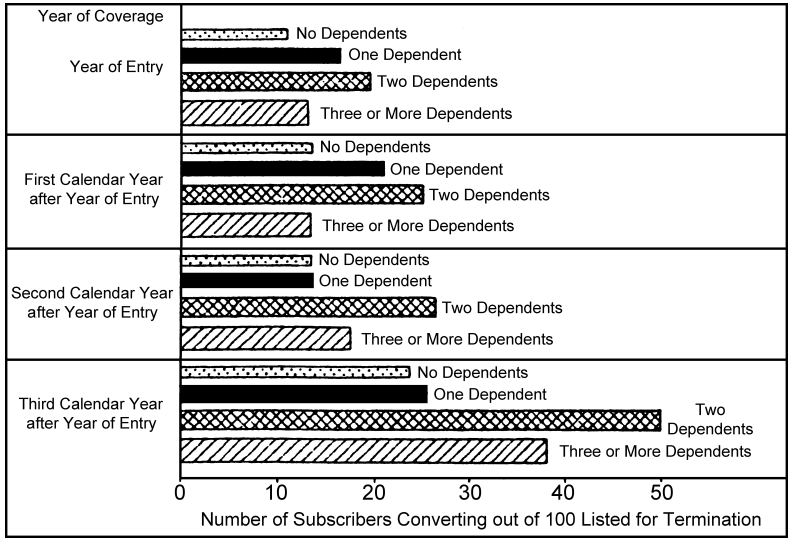


FIGURE 9. Conversions to Individual Policies by Subscribers under Family Contract by Number of Covered Dependents and Length of Coverage of Subscribers

Within families in which the subscriber has two dependents the chance of a subscriber converting increases with the length of his prior coverage. A similar trend appears to be present among subscribers in larger families though there is little difference between the chance of converting in the year of entry and the succeeding year.

The picture for subscribers with no dependents and those with one dependent is not quite as clear but the conversion rates in the third calendar year after entry do seem to be higher than in previous years. It would appear that in each size family there is a tendency for the conversion rate to increase the longer the prior coverage and that this tendency is stronger where there are two and three or more dependents than in smaller families.

The subscriber who covers only himself is more likely to convert if he is covered under a family contract than under an employee-only contract. For the former group the chance is approximately 15 per cent (Figure 9) and for the latter not more than 5 per cent (Table 2). This difference reflects a combination of factors among which are the presence of a purely individual decision to join HIP in the first place and the privilege under the family contract of covering eligible dependents if and when they are acquired.

Class of Account and the Chance of Converting

Of the several classes of accounts, subscribers in the Board of Education had a considerably higher rate of conversion when listed for termination than any other (Table 4). Employees of the Board of Education are largely teachers. It is of interest that the study of Health and Medical Care in New York City (*op. cit.* p. 4) showed that in HIP the proportion of persons seeing a doctor in a year was greatest in those households in which the education of the head of the household was greatest. It was suggested that this might be due to a different concept of illness in the better educated household. If this is true, it may also influence the rate of conversion by Board of Education subscribers.

A high proportion of Board of Education subscribers are females and it was previously shown that a greater proportion of these convert than do males. The possible reasons for this were previously discussed.

Table 4 demonstrates once again that there is considerable variation by class of account. Though there is no clear trend in the conversion rate

TABLE 4
Percentage of Subscribers Listed for Termination Who Convert, by Class of Account and Length of Coverage

Class of Account	Subscribers Listed for Termination			Per Cent Converting		
	1st Calendar Year after Year of Entry	2nd Calendar Year after Year of Entry	3rd Calendar Year after Year of Entry	1st Calendar Year after Year of Entry	2nd Calendar Year after Year of Entry	3rd Calendar Year after Year of Entry
N.Y.C., Board of Education	134	154	86	37.3	21.4	37.2
N.Y.C., Dept. of Sanitation	74	56	40	13.5	19.6	10.0
N.Y.C., Transporation	206	120	—	5.3	10.0	—
N.Y.C., Other	246	173	87	19.9	15.6	34.5
Union and Trustee Accounts	183	97	212	5.5	1.0	0.9
Other Accounts	182	104	26	14.3	12.5	11.5

with length of prior coverage, accounts with initially high conversion rates tend to continue with high rates and similarly for accounts with low initial conversion rates. This suggests that the rate of conversion is tied to the characteristic of the account and is not greatly influenced by experience with the Plan. To test this hypothesis would require a longer period of observation and, since in the previous section there is a suggestion that the probability of conversion increases with time in the larger size families, a more detailed analysis would be necessary to take into account such factors as family size.

Retention of Membership by Enrollees Who Convert

Having considered the factors influencing the chance of converting from a group to an individual policy, we now turn to consider how long persons who have exercised the privilege of converting retain their membership in the Plan. This question is of particular interest since all who convert assume responsibility for full payment of premiums.

Since the primary decision to convert is usually that of the subscriber it would be desirable to limit the analysis to *subscribers* rather than all enrollees but the sample available for study does not yield cohorts of subscribers large enough for reliable results. Accordingly, the following discussion is in terms of enrollees rather than subscribers.

The chance of a convertee remaining in the Plan after conversion is shown in Figure 10 (Appendix Tables A4 and A12). It is clearly very much less than that of enrollees in general. By the time the third enrollment year after conversion has been reached almost half of the enrollees who converted had lost their status in the Plan.

Generally speaking, females who convert remain in the Plan slightly longer than males (Figure 11 and Appendix Table A12) though the difference is not very great.

When length of prior coverage as well as sex is taken into consideration (Figure 12 and Appendix Table A12) it appears that females with at least six months of prior coverage retained membership somewhat longer than those who had been in the Plan less than that length of time when they converted. No consistent pattern is observed for males. In either case the numbers on which the rates are based are small.

When the analysis is confined to adult enrollees (Figure 13 and Appendix Table A13), it is seen that the 20–44 age group has a better

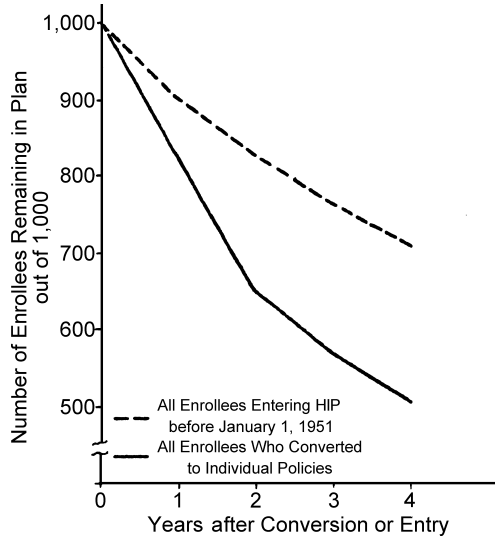


FIGURE 10. Retention of Coverage in HIP after Conversion to Individual Policy and of All Enrollees

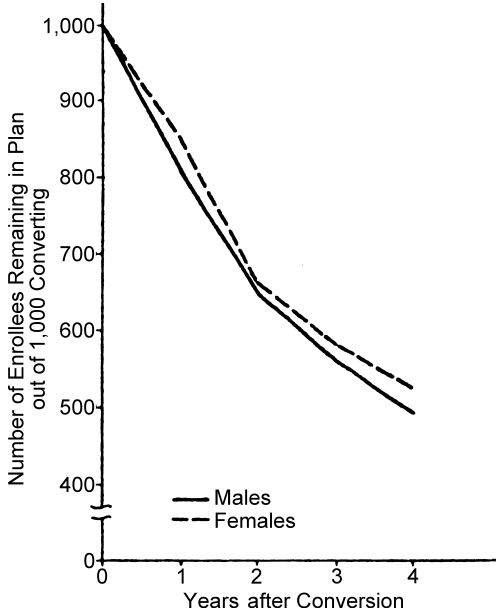


FIGURE 11. Retention of Coverage in HIP after Conversion to Individual Policy, by Sex

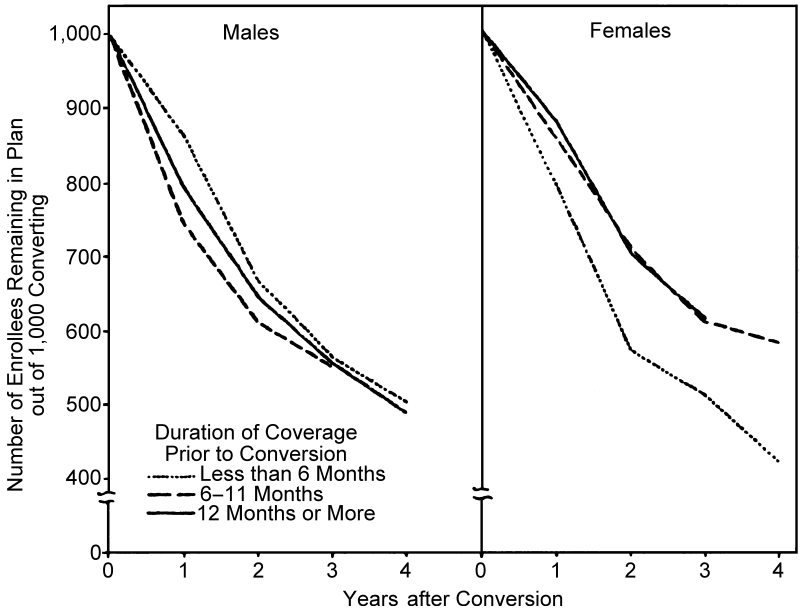


FIGURE 12. Retention of Coverage in HIP after Conversion to Individual Policy, by Sex and Duration of Coverage Prior to Conversion

chance of retaining membership after conversion than the 45–64 group, but even the former group has only about 600 out of every 1,000 still in the Plan in the third year after conversion. The higher retention rate of the younger age group probably reflects greater family responsibilities in that group.

In general, it appears that whatever the factors influencing a person to convert to an individual policy, the chances of his retaining his coverage for any length of time after conversion are not very great.

Summary and Discussion

Any medical care plan is subject to a natural attrition of its membership. People change jobs, moving from an industry covered by the plan to one which is not covered or which has some other type of coverage. Others move out of the area of coverage. Still others retire and cannot afford to pay the entire premium themselves. Families are broken by divorce and no longer continue their coverage. Whole contracts are lost through a

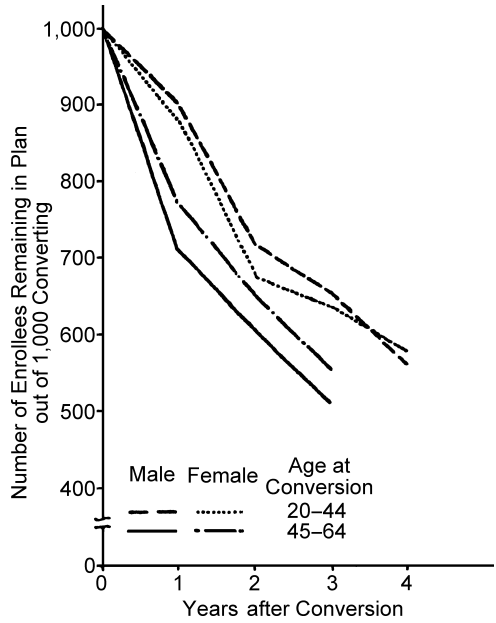


FIGURE 13. Retention of Coverage in HIP after Conversion to Individual Policy, by Age and Sex

variety of circumstances, and, of course, there is an attrition resulting from mortality. In addition to these "involuntary" losses, enrollees may leave the plan because of dissatisfaction with the service they have received or because they see no immediate or pressing need for medical care or because they do not understand the framework in which the medical care is rendered. Whatever the reason, it is obviously desirable from many points of view to have some idea of the magnitude of this attrition and the factors influencing it.

In the first four years of HIP's operation the average annual loss of enrollees was about 9 per cent.[14] The fact that the loss is greatest in the first year after an enrollee enters the Plan may have some influence on retention of coverage. However, the trend is not very marked, the loss rate being 9.7 per cent in the first year and falling to 7.2 per cent in the fourth year. This suggests that the particular nature of any given cohort may play at least as important a part in determining retention of coverage as experience with the Plan. The stability of employment, the age and sex composition of the cohort, and other characteristics not

directly under the control of the Plan itself may be of prime importance in this connection.[15] Certainly the material examined earlier in this report shows far more variation in the retention rates classified according to these characteristics than in regard to length of coverage in the Plan.

Among the characteristics having a considerable influence on retention of coverage is the presence in the family of dependents who are covered by the Plan. Subscribers with dependents in the Plan are more likely to retain their coverage than those without dependents and the retention rate among subscribers under 45 increases with the number of covered dependents.

The greater retention rate of larger size families is of particular significance from the administrative point of view. This becomes apparent when the premium structure is considered. In HIP, there is a three-step premium—that is, given the basic annual premium for one person, the rate for two persons is twice that, but for three *or more* persons it is three times that. Thus, a six-person family pays the same premium as a three-person family. It follows that the higher retention rate of families with dependents may, if not offset by compensating new enrollment, result in an increasing proportion of families of size four or more in the Plan with a consequent reduction in premium income *per enrollee*. If this were to happen some change in either the base premium or the premium structure would be necessitated for the Plan to remain solvent. It is clearly important, therefore, for the Plan to have up-to-date data on the family size composition of its covered population.

In our society the family is the basic social unit. The problems of one member of the family become the problems of the family as a whole. It is of particular interest, therefore, that the highest retention rates are found where the family is covered and that these rates increase with the number of dependents. The benefits of medical care are most likely to accrue when continuity of coverage is provided and the family situation itself increases the likelihood that such continuity will be provided.

A second factor playing an important role in retention of coverage is type and stability of employment. In HIP, enrollees who are employees of the City of New York have higher retention rates than enrollees who are members of various union welfare funds or employees of small private businesses or organizations. Both the union accounts and the small private accounts have less stable conditions of employment than the New

York City departments. The higher retention rates for City enrollees still hold when comparison is restricted to *subscribers without dependents* who are employees of the City and subscribers in the Union and Trustee or the "Other" accounts; the higher retention rates of City employees are therefore not merely a reflection of the influence of covering dependents. In the case of the small private organizations and businesses ("Other Accounts") the fact that many of the enrollees must pay the entire cost of the premium, in contrast with the City departments where the subscriber pays only half the cost, is another factor which can be expected to influence the retention rates unfavorably.

It is of interest that the development of insurance programs for medical care has taken place almost entirely during a period of a rising economy when employment has been high. Should the economy suffer a severe setback with rising unemployment and insecurity of job status, retention of coverage might drop sharply with serious consequences for plans with enrollment concentrated in one or two types of employment. Such a situation could be of particular concern to union welfare programs.

The relation of stability of employment to retention of coverage for medical care should also be of concern to those responsible for community planning. In the past, during periods of major unemployment, relatively few individuals would have previously been covered by medical care insurance. This is no longer the case and the significance of this for long range planning on the part of community welfare and health agencies deserves considerable thought.

Age is another determinant of the retention rate. In HIP retention of coverage decreases with advancing age, the rates, after allowance for mortality, being higher under 45 than over that age. Not only does the overall chance of retaining coverage change with age, but should a person leave covered employment because of job changes, retirement, or similar reasons the chance of his retaining his coverage by converting from a group to an individual policy also varies. The per cent of individuals who take advantage of this conversion privilege when listed for termination under a group policy is about 15 per cent for those 20–44, falls to about 10 per cent for those 45–64, and rises again to about 20 per cent among persons 65 and over. Finally, retention of coverage *after* having converted to an individual policy is greater in the 20–44 age group than in the 45–64 group.

When age and family size are considered together, it is found that retention rates among subscribers under 45 increase with the number

of dependents covered, but among subscribers above that age retention rates did not increase nearly as markedly with the number of dependents. This suggests that, other things being equal, retention of coverage under 45 is a function of the needs of the family as a whole, but over 45 the retention rate is conditioned largely by the needs of individuals in that age group.

In view of the increasing health needs of older persons, particularly in the area of chronic illness, the foregoing observations are of particular interest. It may be that in HIP older enrollees are more likely to have medical contacts prior to joining HIP and the lower retention rate reflects a desire to maintain these contacts. On the other hand, it may be chronic illness itself which results in a lower retention rate among older persons, especially when the illness makes it impossible for them to continue in their jobs and thereby reduces their capacity to continue premium payments even if they should wish to convert to individual policies. Thus, the individual may be deprived of a resource by the very condition with which the resource was designed to cope. From the community standpoint the result may well be a deteriorating social and economic situation ending in economic and/or medical dependency.

While there are no direct observations in this report on the role of education as a factor influencing retention of coverage, the fact that enrollees who are employees of the Board of Education have the highest retention rates of any New York City department and that if they are listed for termination, they also have the highest percentage who convert to individual enrollment, is evidence that education is of importance. These findings agree with those in the report on "Health and Medical Care in New York City" which, through household interviews, found that utilization of medical care facilities was greatest among those with most education.

The foregoing discussion has attempted to show that facts on retention of coverage in a medical care plan are of significance from many points of view. As new patterns of insurance against the costs of medical care emerge and new organizational patterns evolve for providing such care, it will be of importance to assess the effects of these new patterns on retention of coverage not only from the standpoint of the particular program, but also from the broader standpoint of the community as well. It is to be hoped that additional data on enrollment experience will be forthcoming from a variety of situations in the future.

References

1. This is the first of a series of reports based upon the records of the Health Insurance Plan of Greater New York. The analysis was made possible by a grant of funds from the Commonwealth Fund and The Rockefeller Foundation to a Committee for the Special Research Project in HIP. In addition to this analysis of the operating records of HIP, the Committee has published a report of a household morbidity survey of HIP and non-HIP families resident in New York. In addition to the authors, the following members of the Committee were most closely associated with the longitudinal analysis of the records of the Plan: Dr. Lowell J. Reed, Chairman of the Steering Committee, Dr. Selwyn D. Collins, Jerome Cornfield, Dr. Forrest E. Linder.
2. *Progress in Health Services*, v, No. 9, November, 1956. New York, Health Information Foundation.
3. *Building America's Health*. Vol. 3, p. 297, United States Government Printing Office, 1951.
4. *Health and Medical Care in New York City*. Harvard University Press for the Commonwealth Fund, 1957.
5. The only exception to this is a possible $2.00 charge for a night call to the home between 10:00 p.m. and 7:00 a.m.
6. *See* Anderson, O.W. and Feldman, J.J.: *Family Medical Costs and Voluntary Health Insurance: A Nationwide Survey*. New York, McGraw-Hill, 1956, for a discussion of this point.
7. Excluded are dental care, prescribed drugs and biologicals, prosthetic appliances, purely cosmetic surgery; treatment for acute alcoholism, drug addiction, and mental or nervous disorders for which care, after diagnosis, by a psychiatrist is required; illness or injuries which can be treated only in an institution which is not a hospital for general care; anesthesia and certain other services, such as administration of blood plasma, if a hospital requires its administration by its own staff. Workmen's Compensation and Veterans' Administration cases are excluded.
8. Baehr, G.: H.I.P.—An Alternative to Compulsory Medical Insurance. *Connecticut State Medical Journal*, January, 1953, XVII, No. 1.
9. Certificate numbers are assigned in serial number order. A pilot study showed the sample chosen by these means to be random with regard to this number.
10. Not included in the analysis are 1,028 persons who had one or more episodes of *interrupted coverage* during the study period. These were persons who terminated coverage in the Plan and then re-entered the Plan at a later date. Because of the difficulties this group would impose on the analysis and because they were a small group relative to the total they were eliminated in the analysis of survivorship. However, although these persons with interrupted coverage were only a small proportion of the total sample, they did constitute about 20 per cent of the persons with employee-only coverage. They are unlikely to have much effect on retention rates as a whole or on retention of family-coverage groups but they could affect the retention rate of the employee-only groups.
11. A certain amount of the higher retention rates of the 1947 cohort is the result of the technique used in setting up that cohort. The first full calendar year of HIP's operation (and the first year of the study period) was 1948. Persons who both enrolled and terminated coverage in 1947 were excluded from the cohort. Consequently, the 1947 cohort really consists of those persons who entered in 1947 and were still in the Plan on January 1st, 1948. They are a selected group. However, the effect of this selection on survivorship is not great and can be roughly estimated. The average length of time a person in the 1947 cohort would have been in the Plan on January 1, 1948, was about 4 months. If the 1947 curve in Figure 2 is moved to the left, a distance equivalent to 4 months, it will still be well above the curves for the other cohorts.
12. The chances of a person in an employee-only account terminating his coverage and then renewing it again are about three times as great as those of a person terminating from a family-coverage

account. This class of individuals is characterized as having "interrupted coverage" (*see* reference 10).

13. This adjustment was made by adding the number of deaths to be expected in each age group to the observed number of survivors and recalculating the survivorship rates. The expected deaths were calculated based upon Life Tables for 1949–1951, Middle Atlantic Division, *Vital Statistics Special Reports*, Vol. 41, No. 4, July 26, 1956.
14. It should be remembered that this figure is largely determined by the experience of employees of the City of New York, who constituted a high proportion of the enrollment.
15. It would be desirable to have data on the reasons for leaving HIP, but such data are not available in the normal records of the Plan.

Appendix

TABLE A1

Enrollees[1] Entering HIP before January 1, 1951, Classified by Year of Entry, Age at Entry and Sex

Age at Entry and Sex	Number of Enrollees					Percentage of Enrollees				
		Year of Entry					Year of Entry			
	Total	1947	1948	1949	1950	Total	1947	1948	1949	1950
All Ages	27,130	6,675	5,020	10,895	4,540	100.0	100.0	100.0	100.0	100.0
Males	14,303	3,352	2,868	5,791	2,292	52.7	50.2	57.1	53.2	50.5
Females	12,827	3,323	2,152	5,104	2,248	47.3	49.8	42.9	46.8	49.5
Under 5	2,991	487	343	1,361	800	11.0	7.3	6.8	12.5	17.6
Males	1,573	273	166	730	404	5.8	4.1	3.3	6.7	8.9
Females	1,418	214	177	631	396	5.2	3.2	3.5	5.8	8.7
5–14	4,187	998	682	1,958	549	15.4	14.9	13.6	18.0	12.1
Males	2,144	511	350	996	287	7.9	7.6	7.0	9.2	6.3
Females	2,043	487	332	962	262	7.5	7.3	6.6	8.8	5.8
15–24	2,321	399	448	980	494	8.6	6.0	8.9	9.0	10.9
Males	971	184	191	399	197	3.6	2.8	3.8	3.7	4.4
Females	1,350	215	257	581	297	5.0	3.2	5.1	5.3	6.5
25–34	4,836	826	703	2,195	1,112	17.8	12.4	14.0	20.1	24.5
Males	2,338	336	357	1,095	550	8.6	5.0	7.1	10.0	12.1
Females	2,498	490	346	1,100	562	9.2	7.4	6.9	10.1	12.4
35–44	5,784	1,837	1,085	2,148	714	21.3	27.5	21.6	19.7	15.7
Males	3,020	870	602	1,192	356	11.1	13.0	12.0	10.9	7.8
Females	2,764	967	483	956	358	10.2	14.5	9.6	8.8	7.9
45–54	4,114	1,286	992	1,322	514	15.2	19.3	19.8	12.1	11.3
Males	2,375	671	644	792	268	8.8	10.1	12.8	7.3	5.9
Females	1,739	615	348	530	246	6.4	9.2	7.0	4.8	5.4
55–64	2,047	631	548	632	236	7.5	9.4	10.9	5.8	5.2
Males	1,342	379	408	401	154	4.9	5.7	8.1	3.7	3.4
Females	705	252	140	231	82	2.6	3.7	2.8	2.1	1.8
65 and over	451	118	115	151	67	1.7	1.8	2.3	1.4	1.5
Males	352	94	104	108	46	1.3	1.4	2.1	1.0	1.0
Females	99	24	11	43	21	0.4	0.4	0.2	0.4	0.5
Unknown	399	93	104	148	54	1.5	1.4	2.1	1.4	1.2
Males	188	34	46	78	30	0.7	0.5	0.9	0.7	0.7
Females	211	59	58	70	24	0.8	0.9	1.2	0.7	0.5

[1]Enrollees with interruptions in coverage are omitted.

TABLE A2

Enrollees[1] Entering HIP before January 1, 1951, Classified by Year of Entry, Type of Contract and Family Status at End of Calendar Year of Entry

	Number of Enrollees					Percentage of Enrollees				
		Year of Entry					Year of Entry			
Type of Contract and Family Status	Total	1947	1948	1949	1950	Total	1947	1948	1949	1950
All Enrollees	27,130	6,675	5,020	10,895	4,540	100.0	100.0	100.0	100.0	100.0
Employee Only Contract	1,754	383	873	266	232	6.5	5.7	17.4	2.4	5.1
Family Contract	25,376	6,292	4,147	10,629	4,308	93.5	94.3	82.6	97.6	94.9
Subscriber, No Dependents	3,296	1,056	576	1,018	646	12.1	15.8	11.5	9.3	14.2
Subscriber with Dependents	6,878	1,789	1,114	2,917	1,058	25.3	26.8	22.2	26.8	23.3
Spouse	6,935	1,704	1,133	2,953	1,145	25.6	25.5	22.6	27.1	25.2
Child	8,267	1,743	1,324	3,741	1,459	30.5	26.1	26.4	34.3	32.1

[1] Enrollees with interruptions in coverage are omitted.

TABLE A3
Procedure Used in Calculating Proportion of a Given Cohort Remaining in HIP a Stated Period of Time after Entry

The example below will illustrate the procedure for the 1947 cohort covered by family contracts. The symbols in the table are defined as follows:

lx = number present at the beginning of the year
dx = number terminating during the year
Lx = average number present during the year = $lx - \frac{dx}{2}$

(In deriving the survivorship of *all enrollees*, the actual person years of coverage contributed by all persons covered were available and were used as the value of Lx. In deriving survivorship curves for *subscribers only*, the above definition was used.)

1,000 mx = termination rate = dx/Lx × 1,000
1,000 px = the proportion remaining in HIP at the end of year x = 1,000 (1 − mx)
1,000 Px = the retention rate = the proportion of the original cohort remaining in HIP 1, 2, 3 or 4 years later where

$P_1 = p_1$
$P_2 = p_2 \times p_1$
$P_3 = p_3 \times p_2 \times p_1$
$P_4 = p_4 \times p_3 \times p_2 \times p_1$

Example: 1947 cohort with family coverage

Year	lx	dx	Lx	1,000 mx	1,000 px	1,000 Px
1948	6,292	354	6,112.5	57.9	942.1	942.1
1949	5,938	240	5,816.5	41.3	958.7	903.2
1950	5,697	417	5,457.2	76.4	923.6	834.2
1951	5,281	213	5,176.5	41.2	958.8	799.8

Thus it is estimated that for every 1,000 enrollees with family coverage in the 1947 cohort, 800 were still in the Plan at the end of 1951.

Note: In the retention of coverage tables which follow only Lx and 1,000 Px values are shown, except for Appendix Table A4, where 1,000 px values are also given. In any given instance the 1,000 px value for the first year is the same as the 1,000 Px value; the 1,000 px value for the 2nd year can be obtained by dividing 1,000 Px for the 2nd year by 1,000 Px for the 1st year; 1,000 px for the 3rd year can be obtained by dividing 1,000 Px for the 3rd year by 1,000 Px for the 2nd year, etc.

TABLE A4

Retention of Coverage in HIP of (a) All Enrollees; (b) Enrollees Classified by Year of Entry; (c) Enrollees Classified by Class of Account at Close of Year of Entry

Year of Entry and Class of Account	Lx				1,000 px				1,000 Px			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
(a) All Enrollees	19,946	24,140	18,699	9,065	903	917	923	928	903	828	764	709
(b) Year of Entry												
1947	6,455	6,106	5,707	5,400	934	954	922	955	934	890	821	784
1948	4,038	4,389	3,996	3,665	898	905	913	887	898	812	742	658
1949	7,144	9,740	8,995		901	913	929		901	822	764	
1950	2,309	3,906			831	884			831	734		
(c) Class of Account:												
N.Y.C. Bd. of Education	3,817	4,299	3,554	3,030	954	953	918	956	954	909	834	798
N.Y.C. Dept. of Sanitation	2,404	2,767	2,164	1,499	920	917	932	917	920	834	778	713
N.Y.C. Bd. of Transportation	5,335	6,611	5,662		889	912	940		889	811	762	
N.Y.C. Other	6,015	7,534	5,556	3,404	922	936	932	959	922	862	804	771
Union and Trustee Accounts	1,038	1,168	964	733	807	851	898	713	807	687	617	440
Other Specified Accounts	1,045	1,451	631	306	749	814	748	870	749	610	456	397
Unknown (Conversions in Year of Entry)	2,888	308	165	91	837	795	867	890	837	666	577	513

TABLE A5
Retention of Coverage in HIP of Enrollees, by Type of Contract and Date of Entry

Year of Entry and Type of Contract	Lx				1,000 Px			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
1947								
Employee Only	343	290	251	223	781	668	598	523
Family	6,113	5,817	5,457	5,177	942	903	834	800
1948								
Employee Only	621	708	636	559	813	694	662	438
Family	3,410	3,681	3,334	3,107	913	835	755	700
1949								
Employee Only	151	215	180		755	667	478	
Family	6,994	9,525	8,815		904	826	770	
1950								
Employee Only	126	164			722	457		
Family	2,183	3,742			837	749		

TABLE A6
Retention of Coverage in HIP of Enrollees, by Type of Contract, Class of Account, and Family Status (All Dates of Entry Combined)

Type of Contract, Class of Account, and Family Status	Lx				1,000 Px			
	Year of Coverage				Year of Coverage			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Family—N.Y.C., Board of Education								
Subscriber, No Dependents	656	733	615	515	938	885	806	767
Subscriber, with Dependents	1,083	1,205	1,020	890	964	926	859	827
Spouse	1,058	1,195	984	843	958	912	840	804
Child	1,021	1,166	935	782	952	904	821	781
Family—N.Y.C., Dept. of Sanitation								
Subscriber, No Dependents	125	157	120	59	936	859	744	656
Subscriber, with Dependents	689	789	635	461	936	873	826	771
Spouse	678	794	631	452	931	869	826	766
Child	912	1,026	778	526	897	801	733	660
Family—N.Y.C., Board of Transportation								
Subscriber, No Dependents	421	503	430		886	787	734	
Subscriber, with Dependents	1,526	1,860	1,641		892	824	783	
Spouse	1,514	1,869	1,621		892	825	783	
Child	1,875	2,380	1,970		885	795	735	

TABLE A6—*Continued*

Type of Contract, Class of Account, and Family Status	Lx				1,000 Px			
	Year of Coverage				Year of Coverage			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Family—N.Y.C., Other								
Subscriber, No Dependents	954	1,139	851	605	936	860	796	752
Subscriber, with Dependents	1,641	2,020	1,524	977	928	879	824	797
Spouse	1,626	2,033	1,518	958	924	872	820	795
Child	1,796	2,343	1,663	864	905	840	775	733
Family—Other Accounts								
Subscriber, No Dependents	241	327	124	51	635	534	357	294
Subscriber, with Dependents	197	295	127	66	832	691	478	420
Spouse	195	293	127	64	774	632	453	396
Child	192	313	138	69	839	691	540	478
Employee Only—Union and Trustee	1,020	1,147	948	723	809	688	618	439
Employee Only—Other Accounts	219	223	115	56	699	515	457	400

TABLE A7

Retention of Coverage in HIP of Enrollees, by Sex and Date of Entry

Year of Entry and Sex	Lx				1,000 Px			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
1947								
Males	3,231	3,039	2,836	2,671	925	880	810	769
Females	3,225	3,067	2,872	2,729	942	901	832	799
1948								
Males	2,285	2,491	2,269	2,072	888	802	737	634
Females	1,753	1,898	1,727	1,594	911	825	747	688
1949								
Males	3,809	5,180	4,764		902	822	760	
Females	3,335	4,559	4,232		900	822	768	
1950								
Males	1,159	1,951			824	718		
Females	1,149	1,955			837	750		

TABLE A8

Retention of Coverage in HIP of Enrollees by Age and Sex (All Dates of Entry Combined)—Observed and with Estimated Deaths Excluded

	Lx				1,000 Px, Observed				1,000 Px, Excluding Estimated Deaths[1]			
Age and Sex	1st Year	2nd Year	3rd Year	4th Year	1st Year	2nd Year	3rd Year	4th Year	1st Year	2nd Year	3rd Year	4th Year
Males												
Under 5	998	1,464	1,042	392	937	877	839	830	943	890	856	853
5–14	1,640	1,981	1,641	750	933	887	843	808	934	888	845	810
15–24	626	673	374	85	700	475	286	104	701	477	287	105
25–34	1,509	1,993	1,409	480	850	751	690	601	851	754	693	605
35–44	2,337	2,793	2,353	1,251	937	889	841	785	941	896	851	797
45–54	1,903	2,147	1,778	1,039	921	857	795	724	932	876	822	757
55–64	1,072	1,173	941	568	886	810	733	647	912	857	798	724
65 and over	270	282	210	123	830	689	597	480	881	775	711	608
Females												
Under 5	901	1,306	912	337	922	872	830	793	927	881	844	811
5–14	1,553	1,896	1,588	708	941	893	852	810	941	893	853	812
15–24	882	1,022	591	160	763	583	413	310	764	584	414	311
25–34	1,680	2,208	1,617	668	885	811	758	734	886	813	761	738
35–44	2,215	2,566	2,133	1,245	941	895	847	818	944	900	854	826
45–54	1,415	1,593	1,286	789	934	876	812	763	941	888	829	783
55–64	580	623	497	302	909	824	760	697	924	853	799	746
65 and over	75	76	46	17	853	640	432	354	888	697	495	422

[1]Estimated mx from deaths for each age-sex group were computed from "Life Tables for 1949–1951, White Males and Females, Middle Atlantic Division" (Tables 5 and 6, Vital Statistics Special Reports, 41, No. 4. pp. 84–87). These values were then subtracted from the observed mx values, and 1,000 px and 1,000 Px values computed to exclude the estimated deaths.

TABLE A9

Retention of Coverage in HIP of Subscribers under Family Contract, by Age and Sex of Subscriber and Number of Covered Dependents at Entry (All Dates of Entry Combined)

Age of Subscriber at Entry, Sex, and Number of Dependents Covered at Entry	Lx[1]				1,000 Px			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
20–44								
All Size Families	4,012	5,500	4,242	1,968	895	826	767	736
Males	2,760	3,939	3,106	1,187	902	833	787	763
Females	1,253	1,570	1,118	782	881	809	717	677
No Dependents	1,343	1,807	1,299	667	863	773	699	660
Males	617	885	653	220	865	766	696	652
Females	726	922	647	448	861	780	701	665
One Dependent	828	1,122	857	390	884	816	746	704
Males	532	762	594	205	874	814	754	710
Females	297	370	263	184	899	819	728	689
Two Dependents	754	1,038	804	389	901	832	783	755
Males	630	889	689	301	895	821	777	764
Females	123	149	115	89	927	895	817	734
Three or More Dependents	1,088	1,534	1,283	524	941	895	857	845
Males	981	1,403	1,171	462	944	896	871	862
Females	106	131	94	62	915	894	674	652

(*Continued*)

TABLE A9—*Continued*

Age of Subscriber at Entry, Sex, and Number of Dependents Covered at Entry	Lx[1]				1,000 Px			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
45 and over								
All Size Families	2,628	3,378	2,747	1,585	911	850	782	735
Males	1,968	2,605	2,129	1,094	903	839	772	724
Females	658	773	618	491	936	883	813	768
No Dependents	896	1,104	885	581	922	856	780	730
Males	437	556	455	247	904	829	754	702
Females	459	548	430	334	939	882	804	756
One Dependent	1,096	1,424	1,149	625	902	834	770	721
Males	943	1,252	1,007	507	896	826	760	708
Females	151	172	142	119	934	885	835	800
Two Dependents	284	374	315	175	891	845	789	753
Males	252	337	284	151	893	845	788	752
Females	32	37	31	25	875	851	796	764
Three or More Dependents	352	477	399	204	932	885	816	776
Males	337	460	384	191	929	882	813	775
Females	16	18	15	14	*	*	*	*

[1]The Lx figures have been computed independently for both sexes, for males, and for females; it is for this reason that the total for both sexes does not always equal exactly the sum for males and females.
*Rates not computed because of low frequencies.

TABLE A10
Retention of Coverage in HIP of Subscribers under Family Contract, by Number of Covered Dependents at Entry and Date of Entry

Date of Entry, and Number of Covered Dependents at Entry	Lx				1,000 Px			
	1948	1949	1950	1951	1948	1949	1950	1951
1947								
All Subscribers	2,747	2,631	2,499	2,365	949	916	853	819
No Dependents	1,058	1,004	946	889	940	898	832	791
1 Dependent	799	762	721	679	944	909	841	803
2 Dependents	395	382	367	350	954	932	879	848
3 Dependents	356	348	333	319	972	952	889	873
4 or More Dependents	140	136	133	129	964	950	914	893
1948								
All Subscribers	1,145	1,506	1,384	1,271	898	836	751	702
No Dependents	396	513	457	407	866	790	674	619
1 Dependent	327	428	393	356	872	813	728	662
2 Dependents	187	250	237	225	963	909	859	817
3 Dependents	160	215	203	192	938	894	832	798
4 or More Dependents	76	101	95	92	934	887	831	831
1949								
All Subscribers		2,233	3,510	3,245		885	807	752
No Dependents		602	937	848		879	785	712
1 Dependent		653	1,018	932		866	778	720
2 Dependents		368	576	534		842	769	720
3 Dependents		380	610	579		947	890	853
4 or More Dependents		230	370	353		922	877	837
1950								
All Subscribers			677	1,438			776	682
No Dependents			265	554			724	610
1 Dependent			183	380			830	747
2 Dependents			105	228			771	684
3 Dependents			87	193			816	752
4 or More Dependents			38	84			790	714

TABLE A11

Percentages of Subscribers under Family Contract Listed for Termination Who Convert in Successive Years of Coverage, by Age of Subscriber at Entry and Number of Covered Dependents at Termination or End of Specified Year

Number of Covered Dependents at Termination or End of Calendar Year Specified, and Age of Subscriber at Entry	Year of Entry		1st Calendar Year after Year of Entry		2nd Calendar Year after Year of Entry		3rd Calendar Year after Year of Entry	
	Listed for Term.	Per Cent Converting	Listed for Term.	Per Cent Converting	Listed for Term.	Per Cent Converting	Listed for Term.	Per Cent Converting
All Subscribers	770	14.4	781	17.7	600	16.3	230	29.1
Under 20	5	*	3	*	7	*	0	
20–44	498	17.3	501	19.6	345	19.1	115	34.8
45–64	217	6.0	221	14.0	208	11.1	91	18.7
65 and over	37	24.3	41	19.5	31	29.0	18	50.0
Unknown	13	*	15	6.7	9	*	6	*
No Dependents	301	11.0	302	13.6	235	13.6	97	23.7
Under 20	3	*	3	*	6	*	0	
20–44	199	10.1	192	13.0	124	12.9	44	20.5
45–64	74	8.1	82	14.6	83	10.8	39	20.5
65 and over	18	27.8	19	21.1	16	43.8	10	*
Unknown	7	*	6	*	6	*	4	*
One Dependent	231	16.5	237	21.1	176	13.6	82	25.6
Under 20	2	*	0		1	*	0	
20–44	123	22.8	116	27.6	78	12.8	30	30.0

45–64	87	5.7	95	14.7	82	14.6	42	19.0
65 and over	18	22.2	21	14.3	15	13.3	8	*
Unknown	1	*	5	*	0		2	*
Two Dependents*	132	19.7	123	25.2	98	26.5	30	50.0
Under 20	0		0		0		0	
20–44	100	26.0	98	27.6	78	32.1	26	53.8
45–64	30	*	23	13.0	18	5.6	4	*
65 and over	1	*	1	*	0		0	
Unknown	1	*	1	*	2	*	0	
Three or More Dependents	106	13.2	119	13.4	91	17.6	21	38.1
Under 20	0		0		0		0	
20–44	76	15.8	95	14.7	65	23.1	15	53.3
45–64	26	7.7	21	9.5	25	4.0	6	*
65 and over	0		0		0		0	
Unknown	4	*	3	*	1	*	0	

*Percentage not computed because of low frequency.

TABLE A12
Retention of Coverage in HIP of Enrollees Who Convert (Overall Retention and Retention on Conversion Status), by Sex and Duration of Coverage Prior to Conversion

Duration of Coverage Prior to Conversion and Sex	Lx				1,000 Px			
	Year of Conversion	Year after Conversion			Year of Conversion	Year after Conversion		
		1st	2nd	3rd		1st	2nd	3rd
	Overall Retention of Coverage							
All Persons	379	661	304	101	828	653	569	507
Less than 6 Months Prior Coverage	123	207	93	35	829	616	537	461
6–11 Months Prior Coverage	71	140	66	36	802	659	579	531
12 or More Months Prior Coverage	185	315	145	30	838	673	585	525
Males	187	325	148	50	807	646	558	491
Less than 6 Months Prior Coverage	59	101	45	19	865	668	563	502
6–11 Months Prior Coverage	36	66	29	15	747	611	549	*
12 or More Months Prior Coverage	92	158	74	17	794	643	556	490
Females	192	337	156	51	849	660	580	523
Less than 6 Months Prior Coverage	63	106	49	17	795	570	511	419
6–11 Months Prior Coverage	35	74	37	22	858	707	610	582
12 or More Months Prior Coverage	93	157	71	13	882	702	613	*
	Retention of Coverage on Conversion Status (without Return to Group Enrollment)							
All Persons	370	580	245	70	830	638	544	458
Less than 6 Months Prior Coverage	121	171	71	24	842	591	516	409
6–11 Months Prior Coverage	70	124	51	25	800	639	539	474
12 or More Months Prior Coverage	179	285	123	20	833	663	561	479
Males	182	283	118	35	808	631	535	442
Less than 6 Months Prior Coverage	58	83	35	14	880	646	554	*
6–11 Months Prior Coverage	35	58	21	9	743	589	505	*
12 or More Months Prior Coverage	89	143	62	12	787	632	530	445
Females	188	297	127	35	851	644	553	474
Less than 6 Months Prior Coverage	62	88	36	11	807	541	481	*
6–11 Months Prior Coverage	35	66	30	17	857	688	574	539
12 or More Months Prior Coverage	90	143	61	8	878	693	591	*

*Not computed because of low frequencies.

TABLE A13
Overall Retention of Coverage in HIP of Enrollees Who Convert, by Sex and Age at Conversion

	Lx				1,000 Px			
Age and Sex	Yr. of Conversion	1 Yr. After	2 Yrs. After	3 Yrs. After	Yr. of Conversion	1 Yr. After	2 Yrs. After	3 Yrs. After
Both Sexes								
Under 20	130	216	96	30	808	632	520	434
20–44	170	311	134	45	889	692	640	569
45–64	62	105	59	21	742	629	533	508
Males								
Under 20	68	106	44	17	764	591	484	398
20–44	80	150	67	22	900	714	649	560
45–64	27	47	25	8	708	603	507	*
Females								
Under 20	62	110	51	13	855	677	558	*
20–44	90	162	67	23	878	672	632	578
45–64	35	58	34	13	769	649	553	*

*Not computed because of low frequencies.