
Stability of Frailty in the Social/Health Maintenance Organization

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Although many long-term care (LTC) programs assume that the disabilities of their frail elderly participants are stable in nature, there has been suggestive evidence to the contrary. This study tests stability of disability among social/health maintenance organization (S/HMO) members who were judged eligible for admission into a nursing home. Identified persons were reassessed quarterly. By the end of 1 year, less than 50 percent were still considered to be nursing home eligible. Logit analysis revealed an increased likelihood of instability for persons who were newly identified as functionally disabled after hospitalization. Policy implications for capitated managed-care programs for the elderly are discussed.

BACKGROUND

Many LTC programs have operational protocols that assume stability of disability among their elderly members (Laudicina and Burwell, 1988; Kemper, Appelbaum, and Harrigan, 1987; Pendleton et al., 1990.) These assumptions are based on a stereotype that the disabilities of an aged person with LTC service needs are permanent and will gradually become worse. Several studies over the past decade (Branch and Ku, 1989; Greenlick et al., 1988; Lewis, Cretin, and Kane, 1985; Manton, 1988) have produced evidence that disputes this assumption, however. These studies suggest that some

disabled elderly have a significant probability of improvement in functional status, even at high levels of disability.

Such findings are particularly relevant in the development of capitated managed-care programs that are at risk for acute or LTC costs for the elderly. Development of appropriate payment mechanisms, timing of subsequent followup assessments, and planning service delivery to subpopulations are all affected by assumptions about the stability of needs. The purpose of this article is to examine the stability of disability among members in one such program, the S/HMO (Leutz et al., 1985), and to explore the policy implications of this issue.

Disability Standards in Program Design

The S/HMOs employ a widely used approach for determining service and payment eligibility, the concept of "nursing home certified" (NHC). Many State Medicaid 2176 waiver programs use this as a means to target persons meeting nursing home preadmission screening criteria (Leutz, Sadowsky, and Pendleton, 1992). Several Medicare and Medicaid demonstrations of expanded community LTC services have used the NHC concept to define a payment cell (Dutcher and Brooks, 1992; Leutz et al., 1985; Zawadski and Eng, 1988). However, there is little published research on the usefulness or characteristics of the NHC rate cell or its relationship to the current Medicare payment system for HMOs, the adjusted average per capita cost (AAPCC) formula (Langwell and Hadley, 1986).

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The AAPCC formula pays an HMO an estimate of what it would have spent for an enrollee had that individual remained in the fee-for-service (FFS) sector. National average per capita Part A and Part B spending estimates for the coming year are factored down to a county level based on the county's relative spending history and demographic mix. Then the payments for each individual enrolled are factored according to how he or she scores on four underwriting dimensions: age, gender, whether or not a resident of a nursing home for the prior 30 days, and whether or not eligible for Medicaid. In 1993, individual Part A factor loadings ranged from 0.55 times the average for a non-welfare, non-institutionalized, Medicaid-eligible male 65-69 years of age to 2.4 times the average for institutional residents over 70 years of age. Part B weightings were similar but not quite so extreme. On average, weightings for the institutionalized were the highest, followed by Medicaid-eligibles.

The S/HMO and On Lok (Zawadski and Eng, 1988) represent the only current demonstrations that use a health status-based modification to the standard AAPCC formula. Both create a category to pay a higher rate for community-dwelling disabled who are found to be NHC, using the nursing home preadmission screening criteria that exist in the States where these programs operate. To date, S/HMOs have simply used the institutional cells for community NHC members. These range from 1.5 to 2.4. For the past few years, On Lok, which enrolls only the NHC-level disabled, has received an NHC adjustment factor somewhat higher than S/HMOs: 2.39 for both Parts A and B for all age groups.

Another difference between S/HMOs and On Lok is that On Lok assumes stability of disability in its population while the S/HMO does not. S/HMO case managers confirm

the NHC classification of enrollees every 3 months and reclassify if indicated. In contrast, On Lok assesses enrollees for eligibility only once, upon entrance into the program.

S/HMOs and On Lok also enroll very different populations in their programs. On Lok and its expansion, the Program For All-inclusive Care for the Elderly (PACE), enroll only persons who qualify immediately as NHC, so all bring the higher Medicare NHC rate as well as a high NHC rate from Medicaid to cover LTC. Most are eligible for both Medicare and Medicaid, with Medicaid the source of 60 to 75 percent of total revenues for PACE/On Lok programs (Kane, Illston, and Miller, 1992).

In contrast, the S/HMOs serve a broad mix of elderly, only a small percentage of whom are NHC- and/or Medicaid-eligible. NHC members are identified at intake or later, when they become disabled, and these members bring higher NHC payment rates for as long as they are classified as disabled. To keep the S/HMO's NHC payment approach budget-neutral, the regular AAPCC cells were lowered to account for taking out a subgroup of high-cost community disabled, estimated to be about 5 percent of the community. (Leutz et al., 1985; Gruenberg, Silva, and Leutz, 1993).

The NHC-AAPCC was meant to provide incentives for S/HMOs to enroll a broad spectrum of elderly and to continue to serve them, despite high costs if they are disabled. S/HMOs that enroll a disproportionately high number of frail are paid more than they would be with 100 percent of the regular AAPCC formula. S/HMOs that enroll fewer frail than the community average are paid less than they would be under 100 percent of the regular formula. S/HMOs thus have an incentive to identify enrollees who qualify as NHC, and a disincentive to move them out of this classification.

Balancing this disincentive, however, is the relationship between NHC and LTC benefits. Although the higher rate category is actually aimed at compensating for the higher medical costs of the disabled, at most sites NHC is also the gateway for enrollees to become eligible for LTC benefits. As a result, S/HMOs are motivated to accurately assess disability in order to balance revenues and expenditures: on the one hand to capture the higher NHC rate, and on the other to keep costs down by limiting liability for providing additional services.

Assessing the stability of disability is important for new S/HMO sites, current sites, and other similarly reimbursed programs in deciding whether regular reassessment is necessary. If disabled elderly are stable in their need for help, then reassessment for eligibility is an unjustified cost. If significant variation in stability is found, then identification of subgroups with a high probability of instability or stability would be useful for targeting services and determining the timing of reassessments.

Based on the previously cited studies, we hypothesized that considerable variation exists in the stability of NHC status in the S/HMO population. We further hypothesized that functional status would fluctuate with medical condition. For instance, elderly persons with acute illnesses might be expected to experience short-term, intense disability episodes requiring additional medical and supportive care. Such persons, if they were not NHC prior to the illness episode, might also be expected to regain function with time. By contrast, we also hypothesized that individuals with multiple disease conditions and/or chronic disability would exhibit greater stability of NHC status in the S/HMO. This premise is informed by the work of other researchers who have examined the relationship of illness to disability (Guralnik et al., 1989; Verbrugge, Lepkowski, and Imanaka, 1989).

Finally, there is the question of what happens to members who lose their NHC status or drop out of the sample. Members could leave the community NHC status for one of several reasons: They could recover functioning to the point of not being eligible; they could enter nursing homes and thus be eligible for higher payments under the AAPCC institutional rate category; they could disenroll from the program voluntarily; or they could die. Transitions out of NHC status can yield insight into the nature of the NHC population and the implications for serving them and paying for their care.

In summary, the present analyses test the underlying assumption of the S/HMO model concerning instability of need in the NHC population. The main research questions are: (1) How stable is the condition of persons in the NHC rate category? (2) What factors predict change in NHC status? and (3) What happens to members who either lose their NHC status or disenroll from the S/HMO?

METHODS

To assess the stability of NHC eligibility, NHC classifications in the S/HMO sites were analyzed for a 1-year period. Data are from the S/HMO Consortium Data Base, which represents information collected from all four sites and processed at the Kaiser Permanente Center for Health Research. Data for this analysis are limited to three S/HMO sites because of missing data on a key variable (hospitalization) at a fourth site.

Available data elements include: member demographic information, NHC status, service utilization information, and comprehensive assessment data for at-risk members. We identified the members who were classified NHC for the first time and then checked whether they were still eligible 3,

6, 9, and 12 months later, as a whole and by site. Members who changed classification from "yes" to "no" at any time in the 1-year timeframe were classified as unstable.

Data were obtained from internal management information systems (MIS) in the S/HMO sites, which were used, in part, to document NHC status for Medicare payment. We assumed that missing data for NHC status, after a period of one or more NHC "yes(s)," was either evidence of disenrollment or change to a "no." Disenrollment was straightforward and could be checked from the membership file. Because NHC was important for Medicare payment, our assumption was that case managers would carefully document persons who requalified as NHC, so as not to jeopardize funding. At one site, only the "yes(s)" were documented in the MIS. If the person had not disenrolled, we did an additional check on the LTC utilization files to determine if the person might have become a permanent nursing home resident. If, after the last NHC "yes," the person had nursing home services authorized in 3 consecutive months, then a "yes" for NHC was imputed for the missing data. If no such nursing home service had been authorized, and the person had not disenrolled, we assumed a "no" for NHC.

We identified 2,541 members who had been categorized as NHC at least once from 1985 to 1989. Members who disenrolled during the year were dropped from the analysis from the point of disenrollment and not included in the denominator when proportions of stability were calculated. We also excluded persons who died within the timeframe, because our aim was not to estimate incidence of improvement from frailty so much as to assess how programs should deal with persons who were still alive and enrolled at the end of each 3-month assessment period. Reasons for disenrollment were then examined separately.

Two samples were used to examine independent variables that are significant predictors of stability in logistic regression analyses. The first sample included all members who had become NHC during 1985-89. Information for this sample included: age, gender, hospitalization history, and NHC status at enrollment. We developed dichotomous (yes/no) variables from these last two items to be proxies for acute versus chronic illness and disability, respectively. If persons had been hospitalized within 60 days of their first NHC classification, we considered their disability to result from an acute condition. If they were classified NHC within 45 days of enrollment, we considered their disability to be chronic.

The second sample provided a richer data set, but it was smaller and represented a more limited timeframe. Members who were assessed during 1985-87 have their comprehensive assessment form (CAF) information coded, computerized, and available for analysis. CAF data allow a detailed look at demographic and functional status variables, as well as self-reported utilization and medical conditions. This early sample of NHC members is somewhat different from the 4-year sample in that it has a larger proportion of persons who were found to be NHC within 45 days of enrollment (41 percent versus 21 percent). Nevertheless, the sample provides a second look at predictors of stability in the frail S/HMO population. We limited analysis with this sample to the predictors of stability at 3 months because of the smaller size of the data set.

Logistic regression models were applied with each of the two samples to determine factors that predict stability of NHC. Models were based on theoretical considerations, with variables progressively dropped if they were found to be insignificant. In addition, marginal probabilities

Table 1
Stability of Nursing Home Certified (NHC) Rating, Measured Quarterly

Rating Period	NHC	Out	Disenrolled	Percent From Prior Period Still NHC	Percent From Base Still NHC ¹
Baseline	2,541	—	—	—	100
3 Months	1,802	482	257	79	79
6 Months	1,353	307	142	82	63
9 Months	1,082	188	83	85	53
12 Months	854	153	75	85	43

¹Controlling for disenrollments.

SOURCE: Kaiser Permanente Center for Health Research; Data from the Social HMO Consortium Data Base, 1985-89.

were calculated for each of the significant variables in the final models. Marginal probabilities estimate the change in the probability of being stable for a person with a particular characteristic, compared with a person without the characteristic, holding all other variables in the model at their mean value (Train, 1986).

Finally, to see what happened to the "unstable" NHC members, we followed persons who were dropped from the NHC category at the first reassessment (sample 1) during the next three periods. We also examined the disposition of persons who disenrolled from the S/HMOs.

FINDINGS

Stability of Frailty

As shown in Table 1, 21 percent of NHC members were no longer classified as such when reassessed at the first 3-month check, after controlling for disenrollments. At 6 months, 18 percent of the remaining group left the NHC category, presumably because they got better and no longer qualified under the criteria for their site. At 12 months, only 43 percent of the original sample were still NHC. Site variations from this pattern were minor (Table 2). Thus, the experience of our overall sample would

suggest that less than one-half of patients who at any time receive an NHC eligibility rating remain consistently in that category for more than a 1-year period.

Factors That Predict Stability

Table 3 displays the logistic regression analysis of factors contributing to stability in our first sample of members at 3 months. All four variables in the model were significant predictors at the 3-month check. Higher age and becoming NHC soon after enrollment were predictors of stability, while recent hospitalization and female gender were predictors of moving out of the NHC category at the 3-month check.

Table 2
Percentage Still Nursing Home Certified¹ From Baseline: Comparison by Site, Measured Quarterly

Rating Period	Site A	Site B	Site C
Baseline	100	Percent 100	100
3 Months	84	78	67
6 Months	66	66	54
9 Months	54	56	46
12 Months	44	47	38

¹Controlling for disenrollments.

SOURCE: Kaiser Permanente Center for Health Research; Data from the Social HMO Consortium Data Base, 1985-89.

Table 3**Logistic Regression of Nursing Home Certified (NHC) Stability at 3 Months, Using 1985-89 Data Set**

Variable	Mean	Beta	SE	Marginal Probability
Intercept	—	.19	.55	—
Age	80.30	*.02	.01	.01 With Each Additional 5 Years of Age
First NHC Within 60 Days After Hospital Discharge	.33	*-.56	.11	-.10
NHC Within 45 Days of Enrollment	.21	*.70	.16	.10
Female	.68	**-.27	.12	-.03

* Statistically significant at $p < .01$.** Statistically significant at $p < .05$.NOTES: $n = 2,284$. Model chi square = 76.05 with 4 d.f. (-2 Log L.R.) $p = .0001$. Mean (stable) = .79. SE is standard error.

SOURCE: Kaiser Permanente Center for Health Research: Data from the Social HMO Consortium Data Base, 1985-89.

Marginal probabilities indicate the relatively equal and powerful effects of recent hospitalization (negative) and chronic disability (positive) on NHC stability. Hospitalization decreases the probability of stability by almost 13 percent (-.10/.79), whereas disability at enrollment increases the probability of stability by the same percentage.

At 6 months, gender is no longer a significant predictor of stability, although the other variables continue to be significant (Table 4). Indeed, the other three variables appear to have gained impact, as seen by their larger marginal probabilities. Hospitalization preceding NHC now decreases the probability

of stability by more than 20 percent (-.17/.82), and disability at enrollment increases probability of stability by more than 18 percent (.15/.82).

Using the second sample with the same four variables, plus the additional CAF information on income, level of disability, and medical conditions, we found similar results (Table 5). Hospitalization again predicted instability, as did heart condition and recent fracture or injury. In this sample, the marker for NHC within 45 days of enrollment dropped out as other variables representing severe or chronic disability exhibited significance. These variables

Table 4**Predictors of Nursing Home Certified (NHC) Stability at 6 Months, Using 1985-89 Data Set**

Variable	Mean	Beta	SE	Marginal Probability
Intercept	—	** .97	.51	—
Age	80.31	*.02	.006	.03 for Each Additional 5 Years of Age
First NHC Within 60 Days After Hospital Discharge	.31	*-.76	.10	-.17
NHC Within 45 Days of Enrollment	.21	*.78	.14	.15
Female	.69	-.15	.11	—

* Statistically significant at $p < .01$.** Statistically significant at $p < .05$.NOTES: $n = 1,660$. Model chi square = 138.15 with 4 d.f. (-2 Log L.R.) $p = .0001$. Mean (stable) = .82. SE is standard error.

SOURCE: Kaiser Permanente Center for Health Research: Data from the Social HMO Consortium Data Base, 1985-89.

were cognitive impairment (more than three wrong on the mental status questionnaire) and increasing number of activities of daily living (ADL) impairments. Increasing number of medical conditions was marginally significant ($p = .10$). Reporting dizziness and a marker for high income (more than \$2,100/month) were also significant predictors of stability.

Marginal probabilities indicated that recent hospitalization was by far the strongest single predictor in the model. It decreased the probability of stability by more than 15 percent (-.13/.84). Recent fracture or injury and heart condition decreased the probability by about 7 percent. Evidence of a cognitive disorder, dizziness, and high income all increased the probability by about 7 percent. Each additional ADL dependency and each additional medical condition increased the mean by about 1 percent.

Disposition of Unstable and Disenrolled Members

Table 6 displays the disposition of NHC members who were no longer NHC after the first reassessment period. Of the 530 persons who left the NHC category 3 months after their first NHC, 103 persons (19.4 percent) became NHC again within the next 9 months. Of these 103, 7 died during the period. Of the 427 who did not become NHC again, 46 (11 percent) died within the 9-month followup period, and 10 others were permanently placed in a nursing home. Twenty more (5 percent of 427) disenrolled from the S/HMO. Presumably the remaining 351 persons, representing two-thirds of the original group who were no longer NHC after 3 months, continued in the S/HMO in improved health and functioning.

A total of 557 people disenrolled during our rolling 1-year sampling frame of NHC experience. As can be seen in Table 7, 80

Table 5

Predictors of Nursing Home Certified (NHC) Stability at 3 Months, Using 1985-87 CAF Data Set

Variable	Mean	Beta	SE	Marginal Probability
Intercept	—	*1.06	.32	—
First NHC Within 60 Days After Hospital Discharge	.26	*-.96	.34	-.13
High Income	.21	** .68	.35	.06
Number of Medical Conditions	4.90	***.11	.07	.01 Increase With Each Medical Condition
Dizziness	.41	** .61	.27	.06
Heart Condition	.42	**-.64	.38	-.07
More Than Three Wrong on MSQ	.27	*.78	.34	.07
Recent Fracture or Injury	.23	***-.52	.28	-.06
Number of ADLs (Partial or Maximum Help)	2.90	***.11	.06	.01 Increase With Each Additional ADL

* Statistically significant at $p < .01$.

** Statistically significant at $p < .05$.

*** Statistically significant at $p < .10$.

NOTES: $n = 562$. Model chi square = 47.33 with 8 d.f. (-2 Log L.R.) $p = .0001$. Mean (stable) = .84. CAF is comprehensive assessment form. SE is standard error. MSQ is mental status questionnaire. ADL is activities of daily living.

SOURCE: Kaiser Permanente Center for Health Research: Data from the Social HMO Consortium Data Base, 1985-89.

Table 6
Nine-Month Followup for Persons No Longer Nursing Home Certified (NHC) at 3 Months, Using 1985-87 Data Set

NHC Status and Percent	Total	Died	Permanent Nursing Home	Disenrolled
Total	530 (100 Percent)	53 (10 Percent of 530)	10 (1.9 Percent of 530)	20 (3.8 Percent of 530)
Became NHC Again	103 (19.4 Percent of 530)	7 (6.8 Percent of 103)	—	—
Did Not Become NHC Again	427 (80.6 Percent of 530)	46 (10.8 Percent of 427)	10 (2.3 Percent of 427)	20 (4.7 Percent of 427)

SOURCE: Kaiser Permanente Center for Health Research: Data from the Social HMO Consortium Data Base, 1985-89.

percent of disenrollments were due to death. Other disenrollments were due to a move out of the area (2 percent), an internal transfer to the less expensive Tax Equity and Fiscal Responsibility Act (TEFRA) HMO option (2 percent), transferring to Medicare FFS or another HMO (3 percent), permanent placement in a nursing home (6 percent), or unknown reasons (7 percent).

All of the internal transfers took place at a single site. Transfers to the less expensive TEFRA HMO option could have occurred because the enrollee had reached the spending limits on S/HMO LTC benefits or had been admitted for permanent placement in a nursing home. S/HMO enrollees who wished to continue their medical care within the HMO, but for whom the long-term benefits were no longer applicable, had the option of internal transfer.

DISCUSSION

Data obtained during 1985-89 from S/HMO sites support the hypothesis that considerable variation does exist in the stability of disability among community-dwelling elderly. As expected, evidence of an acute condition immediately prior to an enrollee's first NHC was associated with instability. Evidence of a more chronic and/or severe disabling condition was related to stability of NHC status. Both the

larger sample and the more detailed CAF sample supported our hypotheses.

Previous hospitalization as a marker for an acute episode proved the strongest single variable predicting instability. NHC status close to enrollment was an important factor in the larger sample, but dropped out in the CAF sample. Here it was replaced by evidence of cognitive impairment, increasing medical conditions, and higher ADL dependencies. The associations of instability with female gender in the first model and stability with high income in the CAF model were not expected. Because NHC eligibility is also associated with services eligibility, such associations are of potential policy concern.

Table 7
Number and Percent of Nursing Home Certified Disenrollments, by Reason

Reason	Number	Percent
Total	557	100
Death	443	80
Moved Out of Area	13	2
Internal Transfer to TEFRA HMO (Low Option)	13	2
Transfer to FFS or Other HMO	15	3
Permanent Nursing Home Placement	34	6
Other/Unknown	39	7

NOTES: TEFRA is Tax Equity and Fiscal Responsibility Act. HMO is health maintenance organization. FFS is fee for service.

SOURCE: Kaiser Permanente Center for Health Research: Data from the Social HMO Consortium Data Base, 1985-89.

Effects of gender were mild and only marginally significant, and did not carry over into the CAF analysis. Higher income may have actually replaced the effect of female gender, though with an opposite sign, because female gender was associated with lower income ($p < .0001$).

A report of dizziness on the CAF was another variable that had an unexpectedly strong association with stability. Dizziness may be a proxy for other conditions, such as anxiety or hypotension as an adverse medication effect, and it was a common complaint (41 percent) among our CAF sample. It was not significantly associated with gender, although more males than females in the sample reported this symptom or condition.

The results of these analyses have several policy and program structure implications. First, they suggest that quarterly recertifications are important in determining accurate frailty status and eligibility for the higher Medicare rate. At least quarterly, S/HMO sites reclassify NHC members into lower payment categories if clinical reassessments so indicate. In contrast, On Lok/PACE sites do not recertify quarterly and do not reclassify at all after initial certification of NHC status on entry to the program. Thus it would appear that On Lok/PACE sites technically may be overpaid for that subgroup of their members who regain functioning. To determine the extent of that overpayment, it would be necessary to study the incidence of recovery of functioning among On Lok/PACE members and the length of time they maintain that status.

In this vein, it is also important to consider the impact of changes in eligibility for higher Medicare payment on changes in eligibility for services. Three of the four S/HMO sites require that members be NHC to be eligible to receive expanded LTC services. The fourth site extends

eligibility to those who are at risk of becoming NHC. Thus, being reclassified as not NHC means that S/HMO members at most sites no longer can receive covered LTC services. Because On Lok/PACE sites do not require reclassification, they do not need to terminate LTC services because of recovery of some functioning.

The effects of termination of service eligibility on the S/HMO's LTC population has not yet been fully explored. One concern might be that it is counterproductive to terminate services because those services might be supporting improved functioning. However, there is little, if any, evidence in the literature of such an effect from the provision of community LTC services (Weissert, Cready, and Pawelak, 1988). Another concern might be discontinuity of care, particularly for members who may still need some help with ADL or independent activities of daily living (IADL) needs. The S/HMO membership structure can answer this concern, to a great extent because the person is still served within the S/HMO medical care system. Case managers can also continue to follow such persons, provide case management and referral to community services, and resume covered LTC services, should their status change again.

Present data underscore the importance of this type of followup. A sizeable proportion of persons who left the NHC category after the first quarter was truly unstable in health status, with one-third of the group becoming NHC again or dying during the next 9 months. This type of continuity of medical care and case management would not be possible in the On Lok/PACE model if non-NHC members were forced to disenroll entirely. This may be a good reason not to reassess status in On Lok/PACE.

A second finding relevant to program structures is that hospitalization and other

proxies for acute illness clearly differentiate a subgroup of persons with changing functional status. Other studies (Leutz et al., 1993) have shown that more than two-thirds of referrals to LTC services come from the S/HMO medical care system, excluding persons who were assessed NHC at enrollment. Hospitals were the most frequent referral source. Elderly persons who have been functioning well in the community may have an acute episode of illness or accident resulting in hospitalization. Hospitalization thus becomes a marker for new functional limitations that can frequently be expected to resolve within the next 3 to 6 months.

The S/HMO's broad membership base and integrated service system make it possible for it to create and deliver a short-term LTC benefit beyond Medicare skilled care but more limited in time than most prior community-care LTC programs. This improvement in status cannot necessarily be generalized outside of the S/HMO, because the S/HMO provides services that link to and complement acute care, and presumably assist frail elderly in regaining their best possible functioning.

On Lok/PACE clients may be more stable in their disabilities upon enrollment, in contrast to the newly disabled patients identified in the broad-based S/HMO membership. The results of this analysis support the notion that chronic conditions are associated with more stable disability and need. Research examining the condition on entry, association with the acute-care system, and NHC stability of On Lok/PACE clients would further test this notion.

A final policy message is that programs receiving a large percentage of their referrals from the acute-care and medical systems need to incorporate regular reassessments into their service eligibility and payment protocols more than programs that receive the bulk of their referrals from the

community. As can be seen from the hospitalization mean in Table 3, 33 percent of NHC members had been hospitalized within 60 days prior to their first NHC. LTC programs clearly need to establish strong linkages with hospital discharge planners, gear their service array to appropriately meet the needs of the post-acute patient, and closely coordinate services with existing Medicare post-acute benefits.

Finally, the analysis of disenrollment data shows that death was a major reason for disenrollment at all sites. Other disenrollment pathways are of particular interest, because voluntarily leaving might indicate dissatisfaction with care or benefits. This possibility has been suggested but not confirmed by the HCFA-funded evaluation of the project. Members with functional disabilities were somewhat less satisfied than members without disabilities (Newcomer, Preston, and Harrington, 1991), but members with disabilities were overall somewhat less likely to disenroll than those without disabilities (Harrington, Newcomer, and Preston, 1991).

The evaluators speculated that these findings may indicate that S/HMOs may have more "margin for error" with members who have disabilities, because these members do not have other options to obtain S/HMO LTC benefits. The disenrollment patterns reported herein tend to support the evaluation finding that voluntary disenrollment by frail members who remain in the local community (i.e., who do not move out of area or enter a nursing home) was exceedingly rare. There is nothing in these data to indicate that dissatisfaction with the S/HMO benefits or services was an important factor in disenrollment by frail members.

In conclusion, frail S/HMO members show considerable variation in their NHC careers. Although these findings are limited

to persons who had a S/HMO available to them and who chose to join it, they support previously cited studies that found a similar pattern of change in frailty. Taken together with these other studies, our findings underscore the need to question conventional wisdom about disability among the elderly. Current S/HMO protocols appear to be appropriate for tracking frail members and should be continued at least this often. Intimate connections with acute-care systems facilitate targeted assessments, allowing expanded LTC services to complement traditional HMO care.

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REFERENCES

- Branch, L.G., and Ku, L.: Transition Probabilities to Dependency, Institutionalization and Death Among the Elderly Over a Decade. *Journal of Aging and Health* 1(3):370-408, August 1989.
- Dutcher, J., and Brooks, M.: Responsiveness to Needs Equals Client Satisfaction: The ElderCare Annual Report. Paper presented at the First International Conference on Long-Term Care Case Management. Seattle, WA. February 4, 1992.
- Greenlick, M.R., Nonnenkamp, L.L., Gruenberg, L., et al.: The S/HMO Demonstration: Policy Implications for Long Term Care in HMOs. *Pride Institute Journal* 7(3):15-24, Summer 1988.
- Gruenberg, L., Silva, A., and Leutz, W.: *An Improved Disability-Based Medicare Payment System for the Social/HMO*. Contract Number 99-C-98526/1-07. Prepared for the Health Care Financing Administration. San Francisco, CA. 1993.
- Guralnik, J.M., LaCroix, A.Z., Everett, D.F., and Kovar, M.G.: Aging in the Eighties: The Prevalence of Comorbidity and Its Association with Disability. *Vital and Health Statistics*, Series No. 170. DHHS Pub. No. (PHS) 89-1250. National Center for Health Statistics, Public Health Service. Hyattsville, MD. May 26, 1989.
- Harrington, C., Newcomer, R., and Preston, S.: *A Comparison of SHMO Disenrollees and Continuing Members*. Contract Number 500-85-0042. Prepared for the Health Care Financing Administration. San Francisco, CA. 1991.
- Kane, R.L., Illston, L.H., and Miller, N.A.: Qualitative Analysis of the Program of All-inclusive Care for the Elderly (PACE). *The Gerontologist* 32(6):771-780, December 1992.
- Kemper, P., Appelbaum, R. and Harrigan, M.: Community Care Demonstrations: What Have We Learned? *Health Care Financing Review* 8(4):87-100, Summer 1987.
- Laudicina, S.S., and Burwell, B.: A Profile of Medicaid Home and Community-Based Care Waivers, 1985: Findings of a National Survey. *Journal of Health, Politics, and Law* 13(4):525-546, Winter 1988.
- Langwell, K.M., and Hadley, J.P.: Capitation and the Medicare Program: History, Issues and Evidence. *Health Care Financing Review* 1986 Annual Supplement. Pp. 9-20, December 1986.
- Leutz, W., Sadowsky, E., and Pendleton, S.: *Cost Caps in State Long-Term Care Programs*. Report prepared for the Congressional Office of Technology Assessment. Washington. U.S. Government Printing Office, August 1992.
- Leutz, W.N., Greenberg, J.N., Abrahams, R., et al: *Changing Health Care for an Aging Society: Planning for the Social Health Maintenance Organization*. Lexington, MA. Lexington Books, 1985.
- Leutz, W., Abrahams, R., Altman, S., et al: *Design of Second-Generation Social Health Maintenance Organization Sites*. Contract Number 99-C-98526/1-07. Prepared for the Health Care Financing Administration. Waltham, MA. April 1993.
- Lewis, M.S., Cretin, S., and Kane, R.: The Natural History of Nursing Home Patients. *The Gerontologist* 25(4):382-388, August 1985.
- Manton, K.G.: A Longitudinal Study of Functional Change and Mortality in the United States. *Journal of Gerontology* (43)5:153-161, September 1988.
- Newcomer, R., Preston, S., and Harrington, C.: *Health Plan Satisfaction Among Members of the Social Health Maintenance Organization*. Contract Number 500-85-0042. Prepared for the Health Care Financing Administration. San Francisco, CA. 1991.

Pendleton, S., Capitman, J., Leutz, W., and Omata, R.: *State Infrastructure for Long-Term Care: A National Study of State Systems*. Institute for Health Policy, Florence Heller Graduate School, Brandeis University. Boston, MA. March 1990.

Train, K: *Qualitative Choice Analysis. Theory, Econometrics and an Application to Automobile Demand*. Cambridge, MA. The MIT Press, 1986.

Verbrugge, L.M., Lepkowski, J.M., and Imanaka, Y.: Comorbidity and Its Impact on Disability. *Milbank Quarterly* 67(3 and 4):450-484, 1989.

Weissert, W.G., Cready, C.M., and Pawelak, J.E.: The Past and Future of Home and Community-Based Long-Term Care. *Milbank Quarterly* 66(2): 309-388, 1988.

Zawadski, R., and Eng, K.: Case Management in Capitated Long-Term Care. *Health Care Financing Review* 1988 Annual Supplement Pp. 75-82, December 1988.

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