The Evaluation of the National Long Term Care Demonstration

7. The Effect of Channeling on the Use of Nursing Homes, Hospitals, and Other Medical Services

Judith Wooldridge and Jennifer Schore

An analysis of the impacts of channeling on the use of hospital, nursing home, and other medical services is described. Comprehensive data on hospital and nursing home use were obtained from Medicare and Medicaid claims and provider records; other medical service use was limited to that which is reimbursed by Medicare or Medicaid. The analysis showed that the population served was not at high risk of institutionalization, and that the reductions in nursing home use among the treatment group were neither large nor, generally, statistically significant. An exception was for the small group of persons who were in a nursing home at enrollment, for whom large reductions in nursing home use were found. The population showed a very high use of hospitals and other medical services, but the channeling program had no impact on the use of these services.

The frail elderly are heavy users of acute and long-term care medical services. Thus, a central question for the channeling evaluation was whether these expensive services were reduced sufficiently to offset the costs of the channeling program. Comprehensive data were collected from Medicare and Medicaid claims and provider records to answer

Judith Wooldridge, M.A. is a Senior Researcher and Jennifer Schore, M.S. is a Research Analyst at Mathematica Policy Research. Address correspondence to Judith Wooldridge, Mathematica Policy Research, Inc., P.O. Box 2393, Princeton, NJ 08543-2393.

this question. Two analytical subsamples of the research sample were identified for whom complete nursing home or acute medical service data were available. Using these samples, we estimated the impact of channeling for the full samples and for subgroups distinguished by their prior service use, frailty, and demographic and socioeconomic characteristics. Impacts were estimated separately for the basic case management model and the financial control model. (See Wooldridge and Schore (1986) for a more detailed technical discussion of these results.)

As discussed in the first article (Carcagno and Kemper), channeling was intended to reduce the use of nursing homes through case management and, particularly under the financial control model, through payment for community services. A reduction in the number of days in a nursing home was expected from two sources: fewer clients becoming permanent nursing home residents, and the substitution of in-home care for convalescent care in nursing homes. Offsetting the reductions to some extent, increases were possible both in the number of short-term convalescent stays (for those clients who would otherwise become nursing home residents) and in the number of long-term nursing home residents who case managers deemed to be served more appropriately in nursing homes but who would not otherwise have entered them.

A similar substitution of community care for hospital care, although not a primary objective of channeling, was also a possible outcome of channeling. If, because of the availability of community services clients in hospitals were to be sent home sooner, or if clients in hospitals who were waiting for a nursing home bed were to decide instead to return to the community, hospital stays would be reduced. In addition, hospital use would be reduced if case managers made sure that health problems were treated at an earlier stage — before hospitalization became necessary. These reductions could be partially offset, however, by increases in use by persons who would have been in nursing homes without channeling (and who therefore would have had some ailments treated by the nursing home) and by persons with previously neglected conditions identified through case manager monitoring.

Finally, the substitution of community care for nursing home and hospital care was expected to increase the use of physician services and other medical services delivered while the patient was not in a nursing home or hospital.

In fact, channeling did not substantially affect nursing home use, although treatment group use was generally slightly lower than control

group use. Channeling had no effect on the use of hospitals, physicians, or other medical services delivered outside the nursing home or hospital.

NURSING HOME USE

Trends in nursing home use over 18 months are shown in Figure 1. The percent of the surviving control group in a nursing home rose from 2–3 percent at enrollment to 13–14 percent after 12 months and to 19 percent after 18 months. These rates of nursing home use are somewhat higher than those found for the U.S. population ages 75–84. (The average age of the channeling sample at enrollment was 80 years.) Of the U.S. population ages 75–84 in 1977, 6.8 percent were in a nursing home; of those 85 and older, 21.6 percent were in a nursing home (U.S. Public Health Service, 1980).

Despite the effort to identify a population with a high risk of nursing home placement, the channeling control group's institutionalization rates were lower than expected. In the absence of channeling, only one of eight channeling treatment group members who were still alive would have been in a nursing home one year after he or she was initially enrolled.

Under channeling, as indicated by Figure 1, treatment group institutionalization rates were generally lower than control group rates after enrollment. At the end of the first year under the basic model, 13 percent of the control group was institutionalized, compared with 11.6 percent of the treatment group. Under the financial control model, the corresponding estimates were 14 percent for the control group and 11.3 percent for the treatment group. Neither difference is statistically significant. However, reductions in institutionalization rates at the end of the first and second months (not shown) under the basic model were statistically significant.

Admission rates and the number of days spent in nursing homes provide more precise measures of the magnitude of the treatment/control differences. Table 1 shows both measures for the three six-month periods of the demonstration for those alive at the beginning of each period. Control group admission rates were fairly consistent over time. About 13 percent were admitted in the first six months, about 11 percent in the next six months, and 12–16 percent in the last six months. There were no effects on the percentage admitted for any time period under either model.

The treatment group spent fewer days in nursing homes than the

Figure 1: Percent of Survivors in a Nursing Home over Time
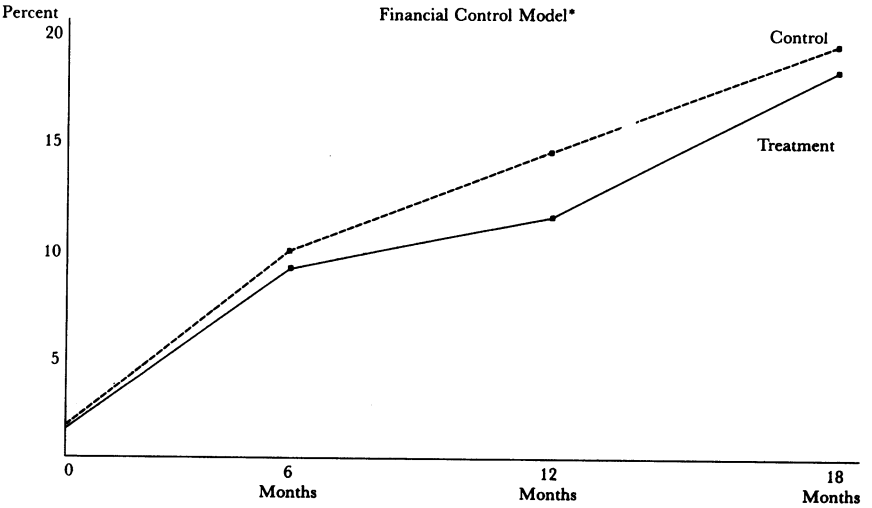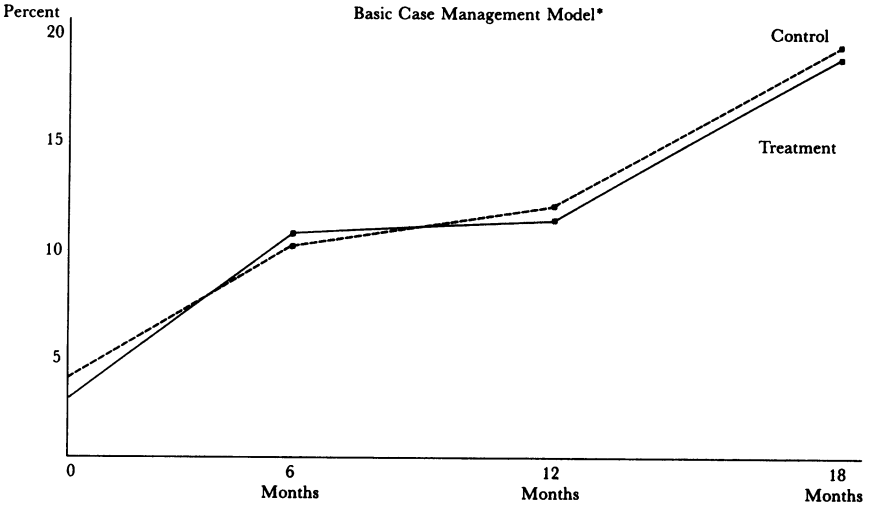
Source: Wooldridge and Schore, 1986, Table C.1.
*None of the treatment/control differences is statistically significant.

Table 1:   Nursing Home Use (by Those Alive at Beginning of Each Period)

	Treatment Group Mean	Control Group Mean	Treatment/ Control Difference*
Percent Admitted			
Basic case management model			
Months 1–6	12.5	13.0	−0.5
Months 7–12	8.5	11.2	−2.7
Months 13–18	11.6	11.6	0.0
Financial control model			
Months 1–6	12.1	12.5	−0.4
Months 7–12	11.0	10.8	0.2
Months 13–18	12.2	15.6	−3.4
Number of Days			
Basic case management model			
Months 1–6	9.8	12.2	−2.4
Months 7–12	18.7	19.9	−1.2
Months 13–18	29.9	32.0	−2.1
Financial control model			
Months 1–6	8.5	9.6	−1.1
Months 7–12	17.0	20.2	−3.2
Months 13–18	27.2	28.2	−1.0

Source: Wooldridge and Schore, 1986, Table IV.3.

Sample Sizes: basic model, 2,184, 1,876, and 741 for months 1–6, 7–12, and 13–18, respectively; financial model, 2,409, 2,023, and 774.

*None of the treatment/control differences is statistically significant at the 5 percent level on a two-tail test.

control group under both models in all three time periods, but the differences were small and none was statistically significant. The six-month difference of 20 percent (or 2.4 days) under the basic model would be statistically significant if a one-tail statistical test were used (that is, not allowing for the possibility of an unexpected increase in nursing home use). The largest difference under the financial model (during months 7–12) was 16 percent, but this amounted only to 3.2 days. Thus, even if the treatment/control differences could be attributed to channeling, their magnitude is small both because the percentage reductions in nursing home use were small and because the number of days spent in nursing homes by the control group (which determines the maximum possible reduction) was low.

There is no evidence to suggest that channeling affected use only in the longer term (rather than within the first 18 months after enroll-

ment). Treatment/control differences did not appear to grow over time. Under the basic model during months 13–18, the treatment group used only 2.1 fewer days than the control group, and under the financial model the treatment/control difference was only one day — despite the continuing gradual growth in nursing home use by the control group.

We explored treatment/control differences for various subgroups of the sample to determine whether there were some types of clients for whom channeling reduced nursing home use. Firm evidence of reductions for both models exists for only one group: those in a nursing home at the eligibility screen. For this small group (2–3 percent of the sample), both models reduced nursing home days substantially. Those in a nursing home at the screen had very high control group nursing home use (117–119 days over the first year, depending on the model), and for this subgroup channeling reduced nursing home use by 29–35 days (24–30 percent), depending on the model. This suggests that channeling may have enabled clients who were in a nursing home at the screen to return to the community earlier than controls. Such an interpretation is consistent with data on how many of those in a nursing home during a particular month were still in a nursing home three months later. For the early months under the basic model and for all months under the financial model, a lower proportion remained institutionalized in the treatment group than in the control group (although these differences were not statistically significant).

HOSPITAL USE

As seen in the third article (Applebaum), many channeling referrals came from hospitals. Indeed, 13.9 percent of the control group in the basic sites and 24.6 percent in the financial control sites were in a hospital when eligibility screening and randomization took place. Subsequent hospital use was high, particularly in the financial control sites. As the control group means in Table 2 illustrate, 46.1 percent of the control group in the basic case management sites were admitted to a hospital at some time during the first six months, declining to 27.8 percent during the final six months. The financial control sites showed a similar pattern, with a drop from 45 percent who had an admission during months 1–6 to 34.7 percent during months 13–18. The same trend appears in hospital days, which declined over time from 11.5 days during months 1–6 to 6.0 days during months 13–18 in basic sites. The consistently higher use in financial sites also declined — from 16.2

days to 8.8 days. The decline in hospital use over time appears to have been due largely to the diminishing effect of an acute episode that precipitated application to channeling for some individuals. Some of the decline may also have been due to the death of sicker sample members over time, leaving a group who required less hospital care.

Channeling did not affect hospital use under either model for any time period. As can be seen from Table 2, the treatment/control differences were small and not statistically significant whether the measure is the percentage admitted or the number of days hospitalized.

PHYSICIANS AND OTHER MEDICAL SERVICES

The use of physician services paid for by Medicare or Medicaid (not shown) was similar to the patterns of hospital use with respect to both time trends and model differences. Under the basic model, 76 percent of the control group saw a physician in the first six months, but the percentage dropped to 71 percent in months 7–12 and 13–18. In the financial control sites, more control group members saw a physician — 86 percent during the first six months — but the percentage dropped to 81 percent and then to 80 percent over the subsequent 12 months. The use of nonphysician medical services (e.g., outpatient services, x-rays, and laboratory services) was somewhat lower but more stable over time. In the basic case management sites, a roughly constant 60–65 percent of control group members received such services. Use was again higher in the financial control sites, with 73–77 percent of the control group receiving services.

Channeling did not affect the use of physicians or other medical services. The treatment/control differences (not shown) were all less than 4 percentage points, none was statistically significant, and the differences were inconsistent in direction.

COMPARISON WITH OTHER DEMONSTRATIONS

There was a wide range of nursing home use among control and comparison groups of other community care demonstrations, from less than a day to 130 days over a 12-month period (Applebaum, Harrigan, and Kemper, 1986). Channeling at 32 and 30 days under the basic and

Table 2:   Hospital Use (by Those Alive at Beginning of Each
Period)

	Treatment Group Mean	Control Group Mean	Treatment/ Control Difference*
Percent Admitted			
Basic case management model			
Months 1–6	43.3	46.1	-2.8
Months 7–12	36.1	36.5	-0.4
Months 13–18	30.9	27.8	3.1
Financial control model			
Months 1–6	47.0	45.0	2.0
Months 7–12	38.5	37.6	0.9
Months 13–18	34.5	34.7	-0.2
Number of Days			
Basic case management model			
Months 1–6	11.1	11.5	-0.4
Months 7–12	8.1	8.3	-0.2
Months 13–18	7.0	6.0	1.0
Financial control model			
Months 1–6	15.5	16.2	-0.7
Months 7–12	10.1	10.6	-0.5
Months 13–18	9.6	8.8	0.8

Source: Wooldridge and Schore, 1986, Table V.1.

Sample Sizes: basic model, 2,712, 2,291, and 1,037 for months 1–6, 7–12, and 13–18, respectively; financial model, 2,842, 2,406, and 1,017.

*None of the treatment/control differences is statistically significant at the 5 percent level on a two-tail test.

financial models, respectively, was in the middle of the distribution of the other demonstrations.

Only 3 of the 13 demonstrations that used individual-level data reported statistically significant effects on days of nursing home use. These were the three with extremely high nursing home use levels among their control groups. The results for two of them must be interpreted cautiously, because their comparison groups were not comparable to their treatment groups along several important measured characteristics. The comparison group for one differed from the treatment group in terms of race, sex, and the proportion in a nursing home at enrollment (in addition to catchment area). The comparison group for the other differed from the treatment group in terms of age (in addition to catchment area), and was selected in a very different way.

The third demonstration, the South Carolina Long-Term Care

Project, used an experimental design with random assignment to treatment and control groups (Blackman et al., 1985). It also had very high rates of nursing home use by its control group, almost certainly because it received clients exclusively through the state's nursing home preadmission screen. Thus, applicants had expressed at least a willingness to consider nursing home placement. Over the year after enrollment, nursing home use was reduced by 40 days — a 31 percent reduction from a control group mean of 130 days.

Hospital use in the channeling control group was higher than that found among control/comparison group members in the other demonstrations. Channeling controls averaged 20 hospital days in the basic sites and 27 days in the financial sites over the first 12 months. The three highest of the other demonstrations averaged 16–20 days during the year after enrollment. This suggests that channeling enrolled one of the sickest groups among the demonstrations.

Only one of the prior demonstrations showed a significant effect on hospital use — a decrease in the number of hospital days. Its only data source was Medicaid records, however, which could be quite misleading if the treatment and control groups differed in terms of their non-Medicaid hospital stays.

REFERENCES

Applebaum, R. A. The evaluation of the National Long Term Care Demonstration: 3. Recruitment and characteristics of channeling clients. *Health Services Research* 23(1) (this issue).

Applebaum, R. A., M. Harrigan, and P. Kemper. *The Evaluation of the National Long Term Care Demonstration: Tables Comparing Channeling to Other Community Care Demonstrations.* Channeling Evaluation Supplementary Report 86-02. Princeton, NJ: Mathematica Policy Research, 1986.

Blackman, D., et al. South Carolina Community Long Term Care Project: Report of Findings. Draft. South Carolina State Health and Human Services Finance Commission, Spartanburg, 1985.

Carcagno, G. J., and P. Kemper. The evaluation of the National Long Term Care Demonstration: 1. An overview of the channeling demonstration and its evaluation. *Health Services Research* 23(1) (this issue).

U.S. Public Health Service. *Health United States 1980.* Hyattsville, MD, 1980, Table 43.

Wooldridge, J., and J. Schore. *Evaluation of the National Long Term Care Demonstration: Channeling Effects on Hospital, Nursing Home, and Other Medical Services.* Channeling Evaluation Technical Report, TR-86B-04. Princeton, NJ: Mathematica Policy Research, 1986.