
Utilization of Services in Arizona's Capitated Medicaid Program for Long-Term Care Beneficiaries

Nelda McCall, M.A. and Jodi Korb, M.A.

The Arizona Long-Term Care System (ALTCS), Arizona's Medicaid program for long-term care (LTC) beneficiaries, capitates contractors to provide a full range of acute and LTC services to financially-eligible beneficiaries determined to be at risk of institutionalization. This article compares the acute care utilization experience of LTC beneficiaries in ALTCS with those in a fee-for-service (FFS) Medicaid program, linking data from both the Medicare and the Medicaid program files. Patterns of use observed in Arizona seem more consistent with a managed care environment than those observed in the FFS comparison. Rates of acute care utilization observed for both the capitated and the FFS program should be of interest to States considering incorporating LTC beneficiaries into their Medicaid managed care program.

INTRODUCTION

Throughout the past decade, States have turned increasingly to prepaid managed care as a way to control Medicaid costs and to improve access to care for beneficiaries. While prepaid managed care is becoming increasingly common for providing Medicaid services to the Aid to Families with Dependent Children population, the elderly and disabled have generally been excluded from managed care programs, especially mandatory Medicaid managed

care programs. Only a handful of States require elderly or disabled beneficiaries to enroll in prepaid managed care and, of those who do, an even smaller number include those in need of chronic LTC services (U.S. General Accounting Office, 1996). With LTC costs representing 37 percent of Medicaid expenditures nationwide in 1995 (Scanlon, 1997), States are expressing interest in examining the development of managed care programs that include LTC (Kaiser Commission on the Future of Medicaid, 1995; Lewin-VHI, 1995; Williams, 1994).

Arizona was the first State to implement a capitated mandatory managed care program for beneficiaries who require chronic LTC services. Since 1989, the ALTCS program has capitated acute and LTC Medicaid services delivered to eligible beneficiaries at risk of institutionalization.¹ Eligible beneficiaries are both the elderly and physically disabled and the mentally retarded/developmentally disabled. Findings from HCFA's evaluation of the Arizona LTC system provide important lessons for other States considering a capitated managed care program for LTC beneficiaries (McCall, 1997; McCall et al., 1996).

In theory, capitated programs control costs by encouraging the more efficient use of services. There is evidence from evaluations of acute care programs that managed care may reduce the use of costly institutional services such as hospitalizations or emergency rooms (Riley, 1990;

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¹ The ALTCS program, which operates as a HCFA demonstration project with a section 1115 waiver, covers a full range of medical care services. Behavioral health services were phased into the program beginning in 1990 and ending in 1995.

Hurley, Freund, and Paul, 1993; McCall, Korb, and Driver, 1995). A study by the General Accounting Office (1993) found that access to care was slightly better under managed care approaches than in traditional FFS Medicaid programs, and quality of care was about the same. Little is known, however, about the applicability of these findings to the elderly and disabled in need of chronic LTC services, a population with special and complex health care needs. Initial evidence from the Program of All Inclusive Care for the Elderly (PACE), which capitates acute and LTC for the frail elderly in 10 demonstration sites throughout the country, suggests reductions in hospital use and increased use of ambulatory and other non-institutional services (Kidder, 1996).

The study described here compares the acute care service utilization experience of elderly and physically disabled ALTCS beneficiaries with that of elderly and physically disabled beneficiaries in a Medicaid FFS program. This study is unique not only because it examines service use in a capitated and a traditional FFS Medicaid program for chronic long-term beneficiaries, but also because it links data from both the Medicare and the Medicaid program files. This integration of Medicare and Medicaid data makes it possible to examine all the acute medical care use of ALTCS beneficiaries.

The ALTCS program capitation payment does not cover Medicare payments for Medicare-covered services used by beneficiaries who are dually eligible for Medicare and ALTCS, although it does include Medicare deductible and copayment amounts. Providers must bill Medicare on a FFS basis for services provided. Neither ALTCS nor its health plans, however, are required to pay coinsurance and deductibles for dually eligible mem-

bers who use out-of-ALTCS providers. From 1994 through 1996, Arizona attempted to secure a HCFA waiver that would permit financial integration of Medicare and Medicaid funding streams to attempt to further integrate their services, but its attempts were unsuccessful.² Minnesota has secured such a waiver (Minnesota Department of Human Services, 1995), and other States are investigating the advisability of pursuing the Arizona or the Minnesota delivery and financing approaches (Meiners, 1994; Epstein, 1995). The data reported here in conjunction with analyses of their own historical Medicare and Medicaid data may be of interest to these States as they pursue their design efforts. The article is divided into three main sections: description of the study population, presentation of the utilization analysis results, and discussion of the study's main findings and implications.

STUDY POPULATION

This study focuses on elderly and physically disabled beneficiaries in ALTCS and in a comparison FFS Medicaid program in New Mexico.³ Acute care utilization data for Arizona before the ALTCS program began were not available nor were State-specific detailed utilization data like those now available in HCFA's State Medicaid Research Files (SMRF). Because of the cost of manipulating individual States'

² Arizona first requested a waiver of this type to amend its existing section 1115 demonstration in April 1994. Because of their inability to negotiate an agreement on three issues, Arizona withdrew its waiver request in March 1996. The three issues on which they were unable to reach agreement were: HCFA wanted dual eligibles who did not make a selection to default into FFS Medicare, HCFA wanted Arizona to cost share for persons who elected to go out of the ALTCS managed care network, and HCFA would not consider a PACE risk adjustment factor.

³ Mentally retarded/developmentally disabled beneficiaries in both programs are excluded from this article. Data concerning their placement level (nursing home or home and community-based care) and their use of ambulatory services were found to be of poor quality in Arizona.

claims files, it was decided to confine this comparison to one State, and New Mexico was selected.⁴

Delivery Systems in Arizona and New Mexico

During fiscal years 1991 and 1992, the Medicaid LTC programs in Arizona and New Mexico covered a similar array of LTC services, including both nursing home care and home and community-based services (HCBS). Eligibility for the LTC program in each State required that an individual meet specified financial and medical/functional criteria. The delivery system in each State is described here.

Arizona

The maximum income permitted under ALTCS was 300 percent of the supplemental security income (SSI) level (\$1,221 per month for an individual in 1991 and \$1,226 per month for an individual in 1992). Beneficiaries also had to be certified to be at risk of institutionalization using a preadmission screening instrument administered by an ALTCS employee in a face-to-face interview with the applicant.

Once deemed eligible for the ALTCS program, elderly and physically disabled beneficiaries were assigned to the LTC program contractor in their county of residence. The contractor was responsible for providing or arranging for a full range of acute, preventive, HCBS, and nursing home services. During fiscal years 1991 and 1992, there were 6 contractors serving the elderly and physically disabled in 13 counties. ALTCS served as the program

contractor in the remaining two counties, managing the provision of services through a FFS network.

Upon enrollment, clients were assessed by the contractor and placed in either an institution or a home and community-based setting. Each program contractor was paid an individually-negotiated, monthly capitation payment per enrollee. The capitation rate varied by county and ranged from \$1,776 to \$2,020 per member month during the study period. This capitation payment did not cover Medicare payments. Medicare was the first payer for Medicare-covered services for beneficiaries who were dually-eligible for Medicaid and Medicare. The ALTCS program contractors were responsible for Medicare copayments and deductibles for dually-eligible beneficiaries using in-network providers.

New Mexico

The income eligibility level for LTC services in New Mexico was slightly below the 300 percent of SSI level: \$1,043 per month in 1991 and \$1,082 per month in 1992. Medical/functional eligibility was determined by the New Mexico Medicaid Professional Review Organization under contract with the State. The professional review organization made this determination by reviewing an applicant's LTC assessment abstract form. For nursing home clients, the assessment form was completed by LTC facility personnel. For clients who were expected to receive HCBS, the assessment form was completed by a licensed physician. Thus, screening was more rigorous and independent in Arizona than in New Mexico.

Institutional services and HCBS were administered by separate agencies within New Mexico's Human Services Department during the study period. Institutional services were administered by Medicaid, but

⁴ Although New Mexico is not a perfect comparison group, we believe that it was the best choice available. It is similar to Arizona in geography, climate, population characteristics, and in health care resources. In addition, the Medicaid LTC delivery systems cover similar services to individuals at risk of institutionalization.

HCBS, provided under a 2176 home and community-based waiver, which provides home care in lieu of institutional placement, were administered by the Coordinated Community In-Home Care program. LTC facilities and HCBS providers were reimbursed per diem or per unit rates set prospectively by the State. Medicare was the first payer for services that it covered. The State paid for Medicaid acute care services on a FFS basis according to a fee schedule.

Data Sources

Utilization data examined in Arizona were encounter data submitted by the LTC program contractors,⁵ FFS claims paid by ALTCS, and Medicare data from the National Claims History data base⁶ maintained by HCFA. Comparison FFS program data included both Medicare data from the National Claims History data base for New Mexico and New Mexico Medicaid claims. Medicaid claims were those processed by the New Mexico fiscal intermediary and HCBS claims processed by the Coordinated Community In-Home Care program. Services included were for care received from January 1, 1991 through September 30, 1992.

Combining Medicare and Medicaid data was complicated not only by the two States' different systems for handling joint Medicare/Medicaid (crossover) claims

but also by inconsistencies in the identification of crossover claims in Arizona. In Arizona, the crossover indicator was incorrectly coded in the encounter data during the study period. In order to correct ALTCS encounter data for crossover activity, all services received by a given beneficiary with the same service type and service date as a service in the Medicare data files were excluded from the ALTCS data. For consistency, this exclusion was also performed for the comparison data.

Characteristics of the Population

The study population consisted of 14,506 person-years of coverage for ALTCS beneficiaries and 8,215 person-years of coverage for New Mexico LTC beneficiaries.⁷ Table 1 shows the distribution of the two groups by selected sociodemographic and eligibility characteristics. Age was similar for beneficiaries in the two programs, with a mean of 77 years. Thirty-eight percent of the person-years in both programs were for the oldest age group, those 85 years and older, and approximately 7 out of 10 beneficiaries were female. The ethnic mix of New Mexico's chronic LTC population differed from Arizona's in that it had a much larger percentage of persons of Hispanic origin. Among ALTCS beneficiaries, 78 percent of the person-years were for white persons, 12 percent were for Hispanics, and 10 percent were for African Americans, Native Americans, or those of another ethnicity. The corresponding numbers for New Mexico were 62 percent, 28 percent, and 8 percent. The majority of ALTCS beneficiaries resided in urban counties (73 percent of the person-years), whereas New

⁵ Although the reporting of encounter data in Arizona has been problematic, collection has improved dramatically since the beginning of the program and has been relatively stable for the last several years. While data quality was found generally to be good, mentally retarded and developmentally disabled (MR/DD) beneficiaries were not analyzed because of lack of data on placement and on non-institutional service use. In addition, some of the type-of-service analyses suggest that the encounter data for the ALTCS beneficiaries may be slightly under reported and that the actual rates of use may be higher than rates reported here. It should be noted that States that do not collect usable encounter data will not be able to conduct these types of analyses.

⁶ Data for ALTCS beneficiaries includes all Medicare claims including those services provided by Medicare providers outside the ALTCS network.

⁷ Beneficiaries were excluded if they did not receive at least one LTC service (i.e., nursing home or HCBS) between January 1991 and September 1992 or were enrolled in a Medicare health maintenance organization (HMO). No utilization data on services used in Medicare HMOs were available. These exclusions were made both in Arizona and in New Mexico.

Table 1
Characteristics of Beneficiaries, by Program

Variable	Arizona Managed Care	New Mexico Fee-for-Service
Person-Years	14,506	8,215
Age	Percent	
Under 65 Years	16.1	17.3
65-74 Years	14.4	13.5
75-84 Years	31.5	31.0
85 Years or Over	38.1	38.2
Sex		
Male	27.8	29.5
Female	72.2	70.5
Ethnicity		
Missing	0.0	2.6
White	77.9	61.8
Hispanic	12.4	27.6
Black	3.8	1.8
Native American	5.2	3.7
Other	0.7	2.5
Urbanization		
Rural	27.4	71.0
Urban	72.6	29.0
Cash Recipient		
No	83.2	82.5
Yes	16.8	17.5
Medicare Coverage		
No	9.9	14.8
Yes	90.1	85.2
Enrollment Span Length		
1-5 Months	5.9	6.7
6-10 Months	12.9	10.1
11-15 Months	16.0	11.3
16-20 Months	14.9	11.8
21 Months	50.4	60.1
Placement		
Home and Community-Based Care	20.0	20.9
Nursing Home	80.1	79.1

NOTE: Percentages may not sum to 100 due to rounding.

SOURCES: Authors' tabulations from Arizona's Prepaid Medicaid Management Information System, New Mexico Medicaid data, New Mexico Community In-Home Care data, and Medicare data from HCFA's National Claims History data base—all January 1, 1991-September 30, 1992.

Mexico Medicaid beneficiaries tended to reside in rural counties (71 percent of the person-years).

Virtually all of the beneficiaries were determined eligible under SSI-related criteria. Medicaid beneficiaries who had income levels below the SSI limit, \$407 per month for an individual in calendar year 1991 and \$409 per month for an individual in 1992, received cash payments from SSI. Approximately 17 percent of

person-years in ALTCS and 18 percent in the FFS comparison were for individuals who received some form of cash assistance. Medicare coverage was indicated in the Medicaid eligibility files for 90 percent of the person-years in ALTCS and 85 percent of the person-years in the New Mexico FFS program. One-fifth of the person-years in ALTCS were for those placed in home and community-based care rather than nursing home care. Twenty-

Table 2
Mean Utilization per Person-Year, by Type of Service and Program

Variable	Arizona Managed Care	New Mexico Fee-for-Service
Person-Years	14,506	8,215
Inpatient Hospital		
Days	3.692	4.731
Admissions	0.524	0.582
Professional Visits	3.231	4.889
Ambulatory Services		
Evaluation and Management Visits	15.033	10.552
Office Visits	4.963	3.043
Nursing Home Visits	7.939	5.346
Consultations/Specialty-Specific Visits	2.131	2.164
Emergency Room Visits	0.924	0.625
Procedures	5.798	3.999
Laboratory Services	6.067	15.289
Radiology Services	4.109	3.372
Drugs		
Prescriptions	29.189	25.753

SOURCES: Authors' tabulations from Arizona's Prepaid Medicaid Management Information System, New Mexico Medicaid data, New Mexico Community In-Home Care data, and Medicare data from HCFA's National Claims History data base—all January 1, 1991-September 30, 1992.

one percent of the person-years in the comparison group were for home and community-based placements.

ANALYSIS RESULTS

Utilization is reported as a rate of use per person-year of eligibility. Rates of utilization were calculated separately for each type of service. Types of service examined were inpatient hospital services, ambulatory services, and prescription drugs. In defining service measures, data from UB-92 claim forms, which are typically used to bill for institutional services, were combined with data from HCFA-1500 forms, which are typically used to bill for non-institutional services.

Inpatient hospital service measures examined were number of inpatient hospital days, admissions, and professional visits for evaluation and management delivered in an inpatient setting. Ambulatory services examined were evaluation and man-

agement visits (office visits, nursing home visits, and consultations and specialty-specific visits), emergency room visits, procedures, laboratory services, and radiology services. This categorization for ambulatory services was adapted from the Urban Institute Type-of-Service Classification System (Berenson and Holahan, 1990), and was based on service codes. Most of the ambulatory services were reported on HCFA-1500 claim forms; however, any evaluation and management visits or procedures delivered in an outpatient facility or clinic setting and reported on a UB-92 claim form were also included in the appropriate service category. For emergency room visits, only those reported on a HCFA-1500 form were counted.⁸ To combine these with the emergency room facility charges reported on UB-92 forms would double count each

⁸ We also counted emergency room visits using only the UB-92 data. The pattern of the results was similar to that found with the HCFA-1500 data but was slightly more pronounced. We elected to present the HCFA-1500 data because we believed it was reported more consistently across the two States.

Table 3
Specifications of Independent Variables

Type/Variable	Specification
Program	
ALTCS	=1 if managed care (ALTCS), 0 if fee-for-service
Sociodemographic Characteristics	
Age ¹	
Under 65 Years	=1 if age at midpoint of enrollment span under 65 years
75-84 Years	=1 if age at midpoint of enrollment span 75-84 years
85 Years or Over	=1 if age at midpoint of enrollment span 85 years or over
Female	=1 if female, 0 if male
Ethnicity²	
Hispanic	=1 if Hispanic
Other	=1 if non-white, non-Hispanic
Urban	=1 if resides in an urban county, 0 if resides in a rural county
Cash	=1 if eligible for cash benefits, 0 if not eligible for cash benefits
Eligibility Characteristics	
Medicare	=1 if eligible for Medicare, 0 if not eligible for Medicare
Enrollment Span Length³	
1-5 Months	=1 if length of enrollment span is 1-5 months
6-10 Months	=1 if length of enrollment span is 6-10 months
11-15 Months	=1 if length of enrollment span is 11-15 months
16-20 Months	=1 if length of enrollment span is 16-20 months
Placement	
Nursing Home	=1 if placed in a nursing home, 0 if placed in HCBS

¹Reference group: 65-74 years.

²Reference group: white, non-Hispanic.

³Reference group: 21 months.

NOTES: ALTCS is the Arizona LTC system. HCBS is home and community-based services.

SOURCE: McCall, N. and Korb, J., Laguna Research, 1995.

emergency room visit (Minnesota Department of Human Services, 1992).

Descriptive Data

Average rates of use are shown in Table 2.⁹ Units of service were larger in the FFS comparison group than in ALTCS for the three measures of inpatient hospital services. FFS beneficiaries had more inpa-

tient admissions per 1,000 person-years (582 versus 524), more inpatient days per 1,000 person-years (4,731 versus 3,692), and more professional visits in the hospital (4.9 versus 3.2).

ALTCS beneficiaries had a larger number of service units for all types of ambulatory services except laboratory services. The majority of ambulatory services were for evaluation and management visits. Beneficiaries in ALTCS had a rate of 15.0 evaluation and management visits per person-year compared with 10.6 for FFS beneficiaries. Of these, approximately one-half were for nursing home visits. Prescription drug use was greater for

⁹ In examining these utilization rates, it should be noted that Arizona was phasing in behavioral health coverage during our study period. At the mental health program's inception in October 1990, coverage for behavioral health services was extended to children under age 18 who required 24-hour supervised care. In April 1991, coverage was broadened to all children under age 18, and those aged 18 to 20 were added in October 1991.

ALTCS beneficiaries, 29.2 per person-year, than for FFS program beneficiaries, 25.8.

Multivariate Analysis

Dependent Variables

In order to assess the impact of the ALTCS program on acute care utilization, eight utilization measures (the dependent variables) were examined in a multivariate context. These dependent variables were: inpatient hospital days, inpatient professional visits, ambulatory evaluation and management visits, emergency room visits, procedures, laboratory services, radiology services, and prescription drugs.

The analysis was conducted in two stages, with the first stage modeling the likelihood of use of a particular service for the entire sample and the second the amount of use among users of that service. The advantage of this model is that it takes into account the large proportion of people with no service use and skewness in the distribution of utilization among those with positive levels of use (Duan et al., 1983). The first stage was estimated using logistic regression. The second was estimated using least-squares linear regression with the dependent variables projected to the full 21-month time period and annualized, then transformed using the natural logarithm. All models were weighted by the number of person-months of coverage. SAS version 6.11 software was used to generate the analytical results.

Independent Variables

Independent variables in the model and their specifications are shown in Table 3. The policy variable of interest is program (managed care or FFS). Other independent variables in the model control for sociodemographic characteristics of the

beneficiary, characteristics of the beneficiary's eligibility, and placement.

Sociodemographic variables in the model are for three predisposing characteristics (age, sex, ethnicity) and two enabling characteristics (urbanization, cash recipient) that influence the use of medical services (Aday, Fleming, and Anderson, 1984; Mentnech et al., 1995; Hahn, 1994; Hurley and Freund, 1988). The cash recipient variable, indicating a beneficiary is receiving cash benefits, is included as a proxy for income. All of these sociodemographic variables were available in the eligibility data for each program.

The model does not include a measure of need for services or health status for two reasons. Control site data were not available for the entire population of chronic LTC users. In addition, it was difficult to conceptualize the set of variables that would be appropriate to use to measure the need for acute medical care utilization by beneficiaries at risk of institutionalization.¹⁰

Eligibility characteristics in the model are an indicator of Medicare coverage and a set of dummy variables for enrollment span length. Medicare coverage is important to control for because it indicates third-party payment for some of the services received. Enrollment span length is the number of

¹⁰ For a subsample of new admissions to both programs, data from their preadmission screening instruments was used to try to compare "sickness" of the populations (Bauer, 1995). Data were much more complete in Arizona than in the control site, and activity of daily living (ADL) measures were coded using different scales in the two States. Efforts to focus analysis on comparisons of those with maximum ADL limitations indicated some ADLs where a larger percentage of the population were maximally limited in Arizona and an equal number where they were maximally limited in the control site. With respect to diagnoses for particular conditions (heart disease; malignant neoplasms; diabetes mellitus; cerebrovascular disease; psychosis, neurotic, and personality disorders; degenerative diseases of the central nervous system; and fractures), when there were differences, Arizona beneficiaries were always more often reported to have the diagnosis. Whether this was more a function of Arizona having a more complete documentation form with more professional application rather than a greater incidence of the condition was suspected but difficult to prove. Thus, rather than use a measure fraught with problems, the health status adjustment was omitted from the model.

Table 4
Coefficients and Odds Ratios From the Logistic Regressions of Using a Service for Each Type of Service

Independent Variable	Inpatient Hospitalization		Inpatient Professional Visit		Evaluation and Management Visit		Emergency Room Visit	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio
ALTCs	**0.304	0.74	**0.471	0.62	**0.933	2.54	**0.147	1.16
Age¹								
Under 65 Years	-0.034	0.97	-0.025	0.98	**1.391	4.02	**0.168	0.85
75-84 Years	*0.090	0.91	-0.051	0.95	-0.251	0.78	*0.085	0.92
85 Years or Over	**0.234	0.79	**0.260	0.77	-0.214	0.81	**0.148	0.86
Female	**0.165	0.83	**0.138	0.87	**0.470	1.60	**0.082	0.92
Ethnicity²								
Hispanic	**0.133	1.14	**0.139	1.15	0.104	1.11	**0.153	1.17
Other	**0.312	1.37	0.095	1.10	**0.718	0.49	*0.126	1.14
Urban	**0.147	0.86	**0.365	0.70	**0.742	2.10	**0.406	1.50
Cash	-0.026	0.97	0.049	1.05	**0.457	1.58	0.054	1.06
Medicare	**0.758	2.13	**0.907	2.48	**3.464	31.93	**0.843	2.32
Enrollment Span Length³								
1-5 Months	**0.310	0.73	*0.151	0.86	**2.881	0.06	**0.745	0.48
6-10 Months	0.043	1.04	*0.105	1.11	**1.346	0.26	**0.320	0.73
11-15 Months	**0.336	1.40	**0.354	1.43	**0.762	0.47	0.046	1.05
16-20 Months	**0.493	1.64	**0.511	1.67	-0.031	0.97	**0.255	1.29
Nursing Home	**0.461	0.63	**0.435	0.65	**0.938	2.55	**0.545	0.58
Intercept	-0.605	—	-0.643	—	-0.046	—	-0.763	—
Number in Sample	23,987	—	23,987	—	23,987	—	23,987	—
-2 Log Likelihood	29,942	—	29,195	—	4,308	—	31,726	—

See Notes at end of table.

Table 4—Continued
Coefficients and Odds Ratios From the Logistic Regressions of Using a Service for Each Type of Service

Independent Variable	Procedure		Laboratory Service		Radiology Service		Prescription Drug	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio
ALTCS	**0.468	0.63	**1.002	0.37	0.054	1.06	**0.191	1.21
Age¹								
Under 65 Years	*0.133	0.88	0.077	1.08	*-0.152	0.86	*0.148	1.16
75-84 Years	-0.056	0.95	-0.079	0.92	*-0.123	0.88	0.100	1.11
85 Years or Older	**0.226	0.80	**0.249	0.78	**0.285	0.75	0.044	1.05
Female	*-0.069	0.93	-0.012	0.99	0.024	1.02	**0.191	1.21
Ethnicity²								
Hispanic	*0.094	1.10	0.017	1.02	**0.170	1.19	**0.167	1.18
Other	**0.197	0.82	**0.289	0.75	-0.008	0.99	*-0.138	0.87
Urban	**0.443	1.56	**0.466	0.63	**0.483	1.62	**1.491	4.44
Cash	*0.133	1.14	**0.224	1.25	**0.118	1.13	**0.380	0.68
Medicare	*0.979	2.66	**0.988	2.69	**1.004	2.73	**0.224	1.25
Enrollment Span Length³								
1-5 Months	**1.499	0.22	**1.047	0.35	**1.247	0.29	**1.745	0.18
6-10 Months	**0.713	0.49	**0.310	0.73	**0.560	0.57	**0.925	0.40
11-15 Months	**0.194	0.82	*0.097	1.10	-0.028	0.97	**0.694	0.50
16-20 Months	0.076	1.08	*0.107	1.11	**0.219	1.25	-0.056	0.95
Nursing Home	**0.243	0.78	**0.904	0.41	**0.111	0.90	**0.460	1.58
Intercept	0.056	—	1.517	—	0.211	—	0.642	—
Number in Sample	23,987	—	23,987	—	23,987	—	23,987	—
-2 Log Likelihood	30,849	—	28,928	—	26,084	—	17,810	—

*Significant at $P \leq .05$.

**Significant at $P \leq .01$.

¹Reference group: 65-74 years.

²Reference group: white, non-Hispanic.

³Reference group: 21 months.

NOTE: ALTCS is the Arizona LTC system.

SOURCES: Authors' tabulations from Arizona's Prepaid Medicaid Management Information System, New Mexico Medicaid data, New Mexico Community In-Home Care data, and Medicare data from HCFA's National Claims History data base — all January 1, 1991-September 30, 1992.

Table 5
Coefficients from the OLS Regressions of the Logged Amount of
Service Use Among Service Users for Each Type of Service

Independent Variable	Inpatient Hospital Days	Inpatient Professional Visits	Evaluation and Management Visits	Emergency Room Visits
ALTCS	**0.185	**0.235	**0.192	0.032
Age¹				
Under 65 Years	0.067	0.056	-0.016	**0.073
75-84 Years	**0.194	**0.144	**0.068	**0.055
85 Years or Older	**0.336	**0.252	**0.174	**0.112
Female	-0.023	*0.065	**0.028	-0.019
Ethnicity²				
Hispanic	-0.003	-0.050	**0.045	**0.054
Other	**0.129	**0.124	**0.137	**0.053
Urban	*0.063	**0.151	**0.231	**0.118
Cash Recipient	-0.003	-0.067	*0.032	0.037
Medicare Coverage	0.006	**0.230	**0.371	**0.167
Enrollment Span Length³				
1-5 Months	**1.636	**1.565	**0.294	**1.579
6-10 Months	**0.932	**0.896	**0.171	**0.832
11-15 Months	**0.439	**0.524	**0.095	**0.483
16-20 Months	**0.294	**0.227	**0.072	**0.217
Nursing Home	**0.073	**0.291	**0.045	**0.249
Intercept	1.911	1.794	1.748	-0.027
Number in Sample	7,319	7,327	21,137	8,834
Adjusted R ²	0.200	0.168	0.103	0.313
	Procedures	Laboratory Services	Radiology Services	Prescription Drugs
ALTCS	**0.549	**0.735	**0.080	0.020
Age¹				
Under 65 Years	*0.107	0.014	-0.035	**0.096
75-84 Years	**0.228	**0.127	**0.078	**0.196
85 Years or Over	**0.275	**0.309	**0.175	**0.388
Female	*0.057	**0.129	0.020	**0.116
Ethnicity²				
Hispanic	0.047	**0.098	**0.065	*0.057
Other	**0.254	0.010	0.013	**0.194
Urban	**0.214	**0.276	**0.100	**0.439
Cash Recipient	0.017	-0.006	0.024	**0.243
Medicare Coverage	**0.384	**0.320	**0.335	**0.105
Enrollment Span Length³				
1-5 Months	**1.319	**1.162	**1.454	**0.452
6-10 Months	**0.616	**0.672	**0.785	**0.277
11-15 Months	**0.322	**0.369	**0.476	**0.248
16-20 Months	**0.160	**0.220	**0.325	**0.106
Nursing Home	-0.036	**0.154	**0.233	0.012
Intercept	0.811	1.966	0.734	2.693
Number in Sample	10,980	12,935	15,026	17,722
Adjusted R ²	0.111	0.137	0.149	0.069

*Significant at $p \leq .05$.

**Significant at $p \leq .01$.

¹Reference group: age 65-74 years.

²Reference group: white, non-Hispanic.

³Reference group: 21 months.

NOTES: ALTCS is the Arizona LTC system. OLS is ordinary least squares.

SOURCES: Authors' tabulations from Arizona's Prepaid Medicaid Management Information System, New Mexico Medicaid data, New Mexico Community In-Home Care data, and Medicare data from HCFA's National Claims History data base—all January 1, 1991-September 30, 1992.

months the beneficiary is eligible for Medicaid during the study period. In the first-stage logistic regression, the enrollment span dummies control for the increased exposure to having service use for those enrolled for longer periods of time. In the second stage, the least squares linear regression, the enrollment span dummy variables control for non-constancies in utilization, either positive or negative, which come about as a result of annualizing the utilization for those enrolled for less than the full 21-month period (Haber, 1995).

The final independent variable in the model is placement (nursing home or home care). Beneficiaries in nursing homes likely have different access to acute care services than beneficiaries residing in the community. Community residents are more likely to go to providers for services and thus are more in control of their demand for care. Nursing home residents are more likely to have care providers come to them. Their demand is influenced strongly by nursing home administrative and medical staff.

Results

Tables 4 and 5 show the results of these estimations. The results are presented separately for each dependent variable. Table 4 contains the coefficients and odds ratios of the independent variables (table rows) for logistic regressions of using a service for each type of service (table columns). The odds ratio estimates how likely it is to have service use. Table 5 shows the coefficients of the independent variables (table rows) for the ordinary least squares regressions of the log of each type of service (table columns).

Controlling for the other variables in the model, beneficiaries in ALTCS were much less likely than those in the New Mexico Medicaid program to be hospitalized (odds of 0.7 to 1), have an inpatient professional

visit (odds of 0.6 to 1), have a procedure (odds of 0.6 to 1), and have a laboratory service (odds of 0.4 to 1). They were considerably more likely to have an evaluation and management visit (odds of 2.5 to 1), an emergency room visit (odds of 1.2 to 1), and a prescription drug (odds of 1.2 to 1). ALTCS beneficiaries were also more likely to have a radiology service (odds of 1.1 to 1), although the result was not statistically significant at the 5-percent level.

The oldest age group, those 75 years of age and over, as compared with those 65 to 74 years of age, had a smaller likelihood of use of an inpatient hospitalization, an inpatient professional visit, an emergency room visit, a procedure, a laboratory service, and a radiology service. Females were less likely than males to be hospitalized, have an inpatient professional visit, have an emergency room visit, or have a procedure, but were more likely to have an evaluation and management visit or a prescription drug. Hispanics were more likely than white persons to use most kinds of services. They had a greater likelihood of having an inpatient hospitalization, an inpatient professional visit, an emergency room visit, a procedure, a radiology service, and a prescription drug. Being in an urban area was associated with greater likelihood of all kinds of services except a hospitalization, an inpatient professional service, and a laboratory service. There was a much higher likelihood of prescription drug use among urban beneficiaries, with odds of more than 4 to 1, as compared with rural beneficiaries.

Receiving a cash payment, and therefore being among the poorest of the group studied, resulted in greater likelihood of an evaluation and management service, a procedure, a laboratory service, and a radiology service, but a smaller likelihood of prescription drug use. Having Medicare coverage showed a strong positive effect on all kinds of

service use. The odds of having an evaluation and management visit was nearly 32 to 1 for Medicare beneficiaries as compared with Medicaid beneficiaries who were not also eligible for Medicare. The odds of use of all the other services except prescription drugs were between 2.1 to 1 and 2.7 to 1. The odds of prescription drug use were only slightly greater for those with Medicare as compared with those without Medicare, 1.3 to 1.

Being in a nursing home rather than in HCBS resulted in significantly smaller odds of use of all services except evaluation and management visits and prescription drugs. Nursing home residents had odds of 2.6 to 1 for the use of evaluation and management services as compared with eligibles in HCB care.

Table 5 shows that among service users, being in ALTCS was significantly associated with less use of most kinds of acute care services. Utilization in ALTCS was 19 percent less for inpatient hospital days, 24 percent less for inpatient professional visits, 55 percent less for procedures, 74 percent less for laboratory services, and 8 percent less for radiology services. However, among those who had at least one evaluation and management visit, there were 19 percent more visits in ALTCS than in the control group. There was no significant difference between the two programs in the number of emergency room visits and the number of prescription drugs among users of such services.

Those in age groups 75 years of age and over had considerably less use of all types of services than those 65 to 74 years of age among those who used a given service. Females were slightly lower users of inpatient professional visits among those with an inpatient visit, and slightly higher users of evaluation and management visits, procedures, laboratory services, and prescription drugs among users of each of these service types than males. Hispanics had

slightly greater use of evaluation and management visits, emergency room visits, laboratory services, and radiology services than white service users of each type. Prescription drug use for Hispanics as compared with white persons was significantly less among those who used prescription drugs. Non-white, non-Hispanic ethnic groups had more inpatient days, inpatient professional visits, emergency room visits, and procedures but fewer evaluation and management visits and prescriptions than users of such services who were white. Residents of urban areas used more of all types of services among users of such services except inpatient days, inpatient professional visits, and laboratory services.

Cash recipients had significantly fewer prescriptions among those with prescription drug use and slightly more evaluation and management visits among those with an evaluation and management visit as compared with those Medicaid beneficiaries not receiving cash. Those with Medicare coverage had significantly more inpatient professional visits (+23 percent), evaluation and management visits (+37 percent), emergency room visits (+17 percent), procedures (+38 percent), laboratory services (+32 percent), radiology services (+34 percent), and prescription drugs (+11 percent) among users of each of the services.

Being in a nursing home rather than in HCB care was associated with less use of all services among users except for procedures and prescription drugs, for which there was no significant effect. Less use was found among nursing home recipients for inpatient days (-7 percent), inpatient professional visits (-29 percent), evaluation and management visits (-5 percent), emergency room visits (-25 percent), laboratory services (-15 percent), and radiology services (-23 percent).

DISCUSSION

The rates of acute care utilization observed in the capitated ALTCS program should provide data of interest to States considering incorporating LTC beneficiaries into capitated Medicaid programs. Data from the Medicaid and Medicare programs for services provided from January 1991 through September 1992 for all ALTCS beneficiaries and all LTC beneficiaries in a FFS Medicaid program in New Mexico were analyzed to examine the utilization rates and to see whether there was evidence that Arizona's capitated managed care program, which covers acute and LTC services, had an impact on the patterns of acute care service use.

Examination of ALTCS rates of use indicate that beneficiaries had 3,692 days of inpatient hospital care per 1,000 person-years and 524 admissions, with an average length of stay per admission of 7 days. They had 15 evaluation and management visits, a little less than 1 emergency room visit, almost 6 procedures, 6 laboratory services, and 4 radiology services, as well as 29 prescriptions filled for each person-year of coverage. These absolute rates of service use indicate relatively substantial utilization of services, especially for evaluation and management type care. The low rate of use for inpatient hospital care is consistent with the hypothesized effects of managed care. Note that the rates in ALTCS are based in part on encounter data that some assume are under-reported. If under-reporting does exist, this would imply slightly higher acute care utilization rates for Arizona, especially for some types of services, a level that suggests it is unlikely that there is significant underutilization of services in this managed care program.

Review of the sociodemographic and eligibility characteristics of the populations of

chronic LTC users in the two States can suggest some important considerations in understanding the dynamics of the chronic LTC population eligible for Medicaid. Almost all of the beneficiaries will likely be eligible for Medicare so that linkage with this important third-party payer must be carefully thought through. This is especially important because of the significant impact of Medicare coverage in the use of all kinds of services and the complexities of designing a process for coverage integration. More than one-half of the beneficiaries are likely to be 75 years of age or over, and 2 in 5 at least 85 years of age. In addition, more than two-thirds will likely be female. Also important to bear in mind is the urbanization of the population, its ethnicity, and the percentage receiving cash assistance. The distribution of the population between those in nursing homes and those receiving HCBS must be considered, although this is to some extent dependent on the screening instrument used for admission to the program and the range of home care services available. All of these factors need to be taken into account in judging how the utilization rates experienced for ALTCS might apply to other programs of this type.

As compared with traditional Medicaid, Arizona's pattern of use shows greater use of evaluation and management services but lower use of hospital services and specialty-type care. The analysis controls for beneficiary sociodemographic variables, eligibility, and placement. ALTCS beneficiaries had greater odds of use than the control group for evaluation and management visits and a greater number of visits among those with at least one visit. They had less utilization both in terms of the likelihood of use and amount of service use among users for inpatient hospital days, inpatient hospital visits, procedures, and laboratory services than the FFS beneficiaries. Likelihood of use was greater in ALTCS than the tradi-

tional group for prescription drugs and emergency room visits, but the amount of use among users for each of these types of services was not significantly different for ALTCS.

Having Medicare coverage significantly increased the likelihood of service use and the amount of use among users. The strong effects on the Medicare coverage variable may suggest that chronic LTC beneficiaries who are enrolled in Medicare are experiencing an insurance effect. However, it should be remembered that there are no independent variables in the model to directly control for health status so that results on the Medicare coverage variable should be interpreted with caution.

Older age groups were consistently associated with less use of all services except evaluation and management services and prescription drugs. This may reflect an increased interest in balancing the risks and rewards of aggressive medical interventions. As people age, the risks associated with more aggressive interventions become greater and may result in fewer services being provided.

Those in nursing home placements as compared with those in HCB care used fewer services for all but evaluation and management services and prescription drugs. Relative to white persons, Hispanics tended to use more of all types of services. Income had little effect on service use except for evaluation and management services and prescription drugs. The poorest, those receiving cash assistance, had more evaluation and management services but less prescription drug use. This latter finding may be an artifact of the sample which is composed only of those under 300 percent of poverty who are at risk of institutionalization.

The results reported in this article suggest that the managed care model in Arizona is promoting a cost-effective deliv-

ery of acute care services to those in need of chronic LTC, this despite the fact that the State's current HCFA waivers do not support the integration of financing for dual eligibles and the majority of the cost savings are accruing to Medicare. Thus, although the Arizona program's financing system continues to be fragmented between FFS Medicare and capitated ALTCS, the delivery system integration achieved seems to be producing an efficient pattern of utilization. Of substantial interest in the future will be the extent to which a more complete financing system integration will result in further differences in service utilization patterns.

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Reprint Requests: Nelda McCall, M.A., President, Laguna Research Associates, 1604 Union Street, San Francisco, California 94123. E-Mail: LagunaR@aol.com.