

---

# Voluntary Disenrollment from Medicare Managed Care: Market Factors and Disabled Beneficiaries

Lee Mobley, M.F.A., Ph.D., Lauren McCormack, M.S.P.H., Ph.D., Bridget Booske, M.H.S.A., Ph.D., Jiantong Wang, M.S., G. Gordon Brown, Ph.D., Nathan West, M.P.A., Judith Lynch, Claudia Squire, M.S., and Amy Heller, Ph.D.

---

*Disenrollment rates from Medicare managed care plans have been reported to the public as an indicator of health plan quality. Previous studies have shown that voluntary disenrollment rates differ among vulnerable subgroups, and that these rates can reflect patient care experiences. We hypothesized that disabled beneficiaries may be affected differently than other beneficiaries by competitive market factors, due to higher expected expenditures and impaired mobility. Findings suggest that disabled beneficiaries are more likely to experience multiple problems with managed care.*

## INTRODUCTION

The U.S. General Accounting Office (1996;1997) recommended public disclosure of disenrollment rates from Medicare managed care plans to help Medicare beneficiaries choose among competing plans, seeing voluntary disenrollment rates as a valuable indicator of plan quality. Although voluntary disenrollment has been recognized as an important outcome, there is debate over the suitability of disenrollment rates as a valid indicator of plan quality (Dallek and Swirsky, 1997; Newhouse, 2000; Rector, 2000; Riley, Feuer, and Lubitz,

1996; Schlesinger, Druss, and Thomas, 1999; Lied et al., 2003). Also, there is debate regarding the relative role that member dissatisfaction plays in explaining voluntary disenrollment rates (Rector, 2000; Riley, Ingber, and Tudor, 1997; Schlesinger, Druss, and Thomas, 1999; Buchmueller, 2000).

Empirical studies have also demonstrated a link between an individual's level of satisfaction with care and his or her probability of disenrollment, with those who were less satisfied being more likely to disenroll (Rossiter et al., 1989; Sainfort and Booske, 1996; Lewis, 1992). Morgan et al. (2000) found that some elderly Medicare beneficiaries disenrolled from their Medicare managed care plans to obtain new coverage for certain conditions, whereas Rector (2000) and Newhouse (2000) found that elderly beneficiaries disenrolled after exhausting drug benefits under their Medicare managed care plan. Burstin et al. (1998/1999) pointed to problems with discontinuity of care as the driving motivator behind an individual's decision to leave a health plan. Schlesinger, Druss, and Thomas (1999) suggested that those who are dissatisfied do not always disenroll. In this article, we explore differential experiences of disabled and elderly Medicare beneficiaries who voluntarily disenrolled from Medicare managed care plans and what expanded plan and physician choice may mean for these two groups of beneficiaries.

---

Lee Mobley, Lauren McCormack, Jiantong Wang, G. Gordon Brown, Nathan West, Judith Lynch, and Claudia Squire are with RTI International. Bridget Booske is with the University of Wisconsin. Amy Heller is with the Centers for Medicare & Medicaid Services (CMS). The research in this article was funded by CMS under Contract Number 500-95-0061. The statements expressed in this article are those of the authors and do not necessarily reflect the views or policies of RTI, the University of Wisconsin, or CMS.

CMS began annual reporting of the voluntary disenrollment rates from Medicare managed care plans in 2000, which have remained relatively stable at about 10 percent over 2000-2002. For example, refer to the Medicare Personal Plan Finder—Why People Leave Plans, on the [www.Medicare.gov](http://www.Medicare.gov) Web site. At this site, disenrollment rates are displayed along with survey responses regarding beneficiaries' most important reasons (MIR) for leaving their plan. These responses come from the Medicare CAHPS® Disenrollment Reasons Survey that we use; however, we analyze all 33 survey questions, while the MIR focuses on only one open-ended question (“What is the most important reason for leaving your health plan?”) which is assigned to one of five MIR reason groupings.

There is limited published literature explaining why beneficiaries disenroll from Medicare managed care plans and the variation in reasons for disenrollment among subgroups of the population or across different type markets. Riley, Ingber, and Tudor (1997) considered the plan's market share as a determinant of disenrollment from Medicare managed care and found that plans with higher market shares had lower disenrollment rates. Cox, Lanyi, and Strabic (2002) and Lied et al. (2003) reported that Medicare managed care disenrollment rates were higher when there were more Medicare managed care plans available in the market to choose from. This also holds true in the private health maintenance organization market (Schlesinger, Druss, and Thomas, 1999). Town and Liu (2003) found that when multiple Medicare managed care plans in an area engaged in strong competition over premium and drug benefits this greatly increased the benefit value available to elderly beneficiaries.

This article examines the experiences of Medicare beneficiaries who voluntarily disenrolled from their Medicare managed

care plan in 2001-2002, with a particular focus on the disabled cohort, defined as beneficiaries under age 65 whose original reason for Medicare enrollment was a disability. We recognize that this cohort does not represent all persons in the Medicare Program with disabilities, since some beneficiaries over age 65 were disabled when they originally enrolled and others have since become disabled. The majority of persons whose original reason for enrollment was disability are under age 65.<sup>1</sup>

In 2002, the Medicare disabled population included about 6 million individuals (14 percent of all Medicare beneficiaries) and this population is expected to grow by about 3 million over the next 30 years as the entire Medicare population doubles (Centers for Medicare & Medicaid Services, 2002). Because of the incentives for managed care plans to avoid beneficiaries with higher expected costs, policymakers have been concerned that Medicare managed care plans may passively discriminate against disabled beneficiaries in their marketing or benefits structures, effectively encouraging only healthier and more able-bodied members to enroll (Brown et al., 1993; Riley et al., 1996; Mello et al., 2003). For example, in 2000, about 7 percent of enrollees in Medicare managed care plans were in poor health, as compared with 13 percent of enrollees in fee-for-service (FFS) plans and 20 percent in Medicaid plans (dually eligibles). Also, only 42 percent of enrollees in Medicare managed care had functional limitations on their activities of daily living, versus 54 percent in FFS and 71 percent in Medicaid (Centers for Medicare & Medicaid Services, 2002). Recent improvements to the risk adjustment of Medicare managed care plan payments will better compensate plans for disease burdens associated with morbidity

<sup>1</sup> A national sample in 2003 found that only 7 percent of the elderly persons (age 65 or over) were originally enrolled in Medicare due to disability (Research Triangle Institute, 2003).

and disability (Pope et al., 2004). Therefore, understanding the experiences of disabled persons in Medicare managed care will continue to be important to policymakers as more Medicare managed care options become available for beneficiaries.

## CONCEPTUAL MODEL

The conceptual model underlying this work recognizes that human decisions are influenced not only by biological factors (such as disability, morbidity, age, race/ethnicity, etc.) but also by factors in the larger environment in which humans live and seek health care. The model combines a traditional access to care and health service utilization model (Aday and Anderson, 1974) with spatial interaction factors (Khan and Bhardwaj, 1994; World Health Organization-Management Sciences for Health, 2000), recognizing that characteristics of the person, characteristics of the chosen health plan, and intervening market environmental factors all impact health care utilization and satisfaction with care received.

To model this complex environment, we considered variables describing the beneficiary and variables that may be important in beneficiary markets (supply, demand, and competition factors). Competition factors include number of alternative Medicare managed care plans available in the county of address, as well as the general market climate towards managed care (approximated by health maintenance organization [HMO] and preferred provider organization [PPO] private market penetration in the area). Market demand level is approximated by the proportion of elderly living in low-income households in the county of address (as actual beneficiary income was not available). The market supply factor included is

the percentage of population living in areas underserved by primary care physicians. The conceptual model also includes congestion factors that can hamper travel to receive care, which we approximate using proportion of the population in urban areas of the county of address. We also take into account variables describing the plan from which they disenrolled. Plan characteristics include years of experience, market share of Medicare business in their service area, and whether drug coverage is provided.

Studies indicate that the rate of voluntary disenrollment from Medicare managed care is higher among selected subgroups of beneficiaries including Black, Hispanic, other non-White, and the dually eligible (Boxerman and Hennelly, 1983; Meng et al., 1999; Virnig et al., 1998; Riley, Ingber, and Tudor, 1997). However, no studies have examined differences in the rate or reasons for disenrollment among disabled persons nor have they assessed how market factors impact the disabled group compared with other beneficiary groups. Until these variables are accounted for, it is not possible to determine if variation in disenrollment among subgroups is due to being a member of that subgroup or for other reasons, such as local factors in the markets where they happen to live. Accordingly, we sought to answer the following research questions:

Question 1: Holding other factors constant, are disabled persons more likely than other beneficiaries to cite particular reasons for disenrolling from their Medicare managed care plans?

Question 2: Are there significant interactions between disabled status and key market factors (supply, demand, and competition) that increase or decrease the propensity for disabled persons to cite particular disenrollment reasons?

## DATA AND METHODS

RTI International and the University of Wisconsin-Madison have conducted an annual survey for CMS since 2000 to determine the reasons why Medicare beneficiaries voluntarily leave their Medicare managed care plans. Excluded from the survey were beneficiaries who disenrolled from Medicare managed care plans because they moved out of a plan's service area, were accidentally disenrolled from the plan due to a paperwork or clerical error, were enrolled in the plan without their knowledge, whose plan left the market area, or who became institutionalized or deceased. The survey is self-administered and conducted via the mail with telephone followup, with a 66-percent response rate in 2002. The sampling design included selecting 388 disenrollees from each Medicare managed care organization, weighting the data to adjust for differing plan sizes and adjusting it for non-response.<sup>2</sup> The non-response analysis showed that those who were older or non-White were less likely to respond to the survey. Dually eligible beneficiaries and disabled sample members under age 65 were also less likely to respond. These adjustments produced a nationally representative analytic sample of 21,687 Medicare respondents who voluntarily disenrolled from 170 Medicare managed care organizations.

We gathered sociodemographic information on beneficiaries from the survey, CMS administrative records including the Enrollment Database (EDB), and other sources (refer to Table 1 for more information). The weighted survey respondents reflect the composition of the general Medicare population with a few exceptions.

For example, our survey respondents had a slightly lower proportion of disabled beneficiaries (10 percent) than the national Medicare distribution (14 percent) and drew primarily from urban areas. About 42 percent of disabled beneficiaries in our survey were minority (48 percent were male, and 38 percent were dually eligible), in contrast to about 32 percent of the Medicare disabled population being minority (where 56 percent were male, and about one-half were dually eligible) (Centers for Medicare & Medicaid Services, 2002). Thus, our sample is fairly representative of the Medicare disabled population.

The survey asks beneficiaries to choose from among 33 different reasons for leaving their plan, and to choose as many reasons as desired. We then used factor analysis to develop latent constructs, or groups of questions, representing 8 distinct domains that cover the 33 survey questions.<sup>3</sup> A particular beneficiary could then be represented only once within a particular major reason group, but could be represented in more than one reason group. The resulting eight categories or major reason groups are shown in Table 2, as well as the 33 individual reasons contained in each major reason group. Figure 1 focuses on the most prevalently cited of the 33 individual reasons for disenrolling, by disabled beneficiaries and beneficiaries age 65 or over. Figure 2 displays the eight major reason groups in 2001 and 2002, with proportions of disabled beneficiaries and those age 65 or over who reported problems in them. In these descriptive analyses, we included 2 years of data to demonstrate that the sampling timeframe occurred during a period of relative stability. (Table 2 and Figures 1 and 2 display both 2001 and 2002 data.)

<sup>2</sup> We classified people surveyed as respondents or non-respondents, then modeled the likelihood of responding as a function of their demographic characteristics, length of enrollment, dual eligibility status, census region, and other variables.

<sup>3</sup> We used PRELIS/LISREL 8.3 software to conduct principal factor analysis on the individual binary responses to the 33 reasons listed on the survey (Mobley, L., McCormack, L., Booske, B., et al., 2004).

**Table 1**  
**Sample Statistics for the Medicare CAHPS® Disenrollment Reasons Survey: 2002**

Variable	Coding for Categorical Variables; Minimum/Maximum for Continuous	Under Age 65, Disabled	Entire Population
			Percent
Age and Disability Status <sup>1</sup>	1 = 64 Years or Under	100	10
	2 = 65-69 Years <sup>2</sup>	—	22
	3 = 70-74 Years	—	27
	4 = 75-79 Years	—	21
	5 = 80 Years or Over	—	20
Sex <sup>1</sup>	1 = Male	48	43
	2 = Female <sup>2</sup>	52	57
Race/Ethnicity <sup>1</sup>	0 = Hispanic	15	13
	1 = Non-Hispanic White <sup>2</sup>	58	71
	2 = Non-Hispanic Black	21	11
	3 = Non-Hispanic Other	7	5
Education <sup>1</sup>	1 = 8 <sup>th</sup> Grade	10	13
	2 = 9 <sup>th</sup> -11 <sup>th</sup> Grade	16	17
	3 = High School/GED	31	32
	4 = Some College	32	25
	5 = Bachelor's Degree or More <sup>2</sup>	11	14
Dually Eligible	1 = Yes	38	15
	0 = No <sup>2</sup>	—	—
Health Status <sup>1</sup>	1 = Excellent <sup>2</sup>	3	9
	2 = Very Good	9	27
	3 = Good	22	34
	4 = Fair	44	23
	5 = Poor	22	6
Disenroll to FFS or MMC	1 = to MMC	44	50
	0 = to FFS <sup>2</sup>	—	—
Satisfaction with Plan	Discrete Values 0-10 = Worst to Best	5.48	6.52
Drug Coverage	1 = Some Drug Coverage	82	83
	0 = No Drug Coverage <sup>2</sup>	—	—
Years Plan has been in Operation	0/25	11.27	11.53
Market Share of Plan	0/0.45	0.09	0.09
Private Managed Care Penetration	0.49/0.84	0.64	0.64
Proportion of County that is Urban	0/1	0.92	0.93
Proportion of Elderly Households with Annual Income < \$15,000	0.06/0.55	0.27	0.26
Percent of State Population Living in Primary Care Physician Shortage Areas, 2001	2.7/27	9.07	8.26
Number of Alternative MMC Plans Available in Home County	0/12	5.524	5.548

<sup>1</sup> Missing data for this variable were imputed using the Centers for Medicare & Medicaid Services Enrollment Database.

<sup>2</sup> Used as a reference group in the logistic model.

NOTES: FFS is fee-for-service. MMC is Medicare managed care. EDB is Enrollment Database.

SOURCE: Centers for Medicare and Medicaid Services: Medicare CAHPS® Disenrollment Reasons Survey conducted by RTI International, 2001 and 2002.



**Table 2**  
**Specific Reasons Cited for Disenrolling from Medicare Managed Care Plan, by Disability and Age Status: 2001 and 2002**

Major Reason Group	Individual Reason for Disenrollment	2001			2002		
		Disabled/ Under Age 65	Age 65 or Over	t-test	Disabled/ Under Age 65	Age 65 or Over	t-test
Plan Information	Given incorrect or incomplete information at the time you joined the plan.	17.6	9.6	**	21.5	8.0	**
	After joining the plan, it wasn't what you expected.	38.4	24.4	**	38.3	22.7	**
	Information from the plan was hard to get or not very helpful.	23.3	13.4	**	25.3	13.6	**
	Plan's customer service staff were not helpful.	24.5	14.2	**	24.5	13.7	**
Doctor Access	Plan did not include doctors or other providers you wanted to see.	32.8	28.5	—	32.7	29.0	—
	Doctor or other provider you wanted to see retired or left the plan.	9.9	16.0	**	11.3	16.1	**
	Doctor or other provider you wanted to see was not accepting new patients.	5.5	5.0	—	5.0	4.0	—
	Could not see the doctor or other provider you wanted to see on every visit.	14.4	12.6	—	16.9	12.5	**
Care Access	Could not get appointment for regular or routine health care as soon as wanted.	13.8	10.2	—	13.7	7.8	**
	Had to wait too long in waiting room to see the health care provider you went to see.	12.7	8.9	—	13.3	6.7	**
	Health care providers did not explain things in a way you could understand.	9.6	7.3	—	11.7	5.8	**
	Had problems with the plan doctors or other health care providers.	21.7	13.2	**	18.1	10.9	**
	Had problems or delays getting the plan to approve referrals to specialists.	22.9	12.5	**	18.2	11.3	**
	Had problems getting the care you needed when you needed it.	26.8	17.1	**	24.0	14.7	**
Specific Needs	Plan refused to pay for emergency or other urgent care.	14.5	6.1	**	14.7	7.1	**
	Could not get admitted to a hospital when you needed to.	4.7	2.4	—	5.2	2.3	**
	Had to leave the hospital before you or your doctor thought you should.	4.4	2.1	—	3.9	2.1	—
	Could not get special medical equipment when you needed it.	7.8	2.5	**	11.6	2.9	**
	Could not get home health care when you needed it.	3.9	2.1	—	6.7	2.4	**
	Plan would not pay for some of the care you needed.	27.4	14.4	**	32.9	19.2	**
Other Care or Service	It was too far to where you had to go for regular or routine health care.	8.3	6.5	—	9.0	6.0	*
	Wanted to be sure you could get the health care you need while you are out of town.	7.9	6.2	—	7.6	7.3	—
	Health provider or someone from the plan said you could get better care elsewhere.	11.7	7.4	—	11.1	9.7	—
	You, another family member, or friend had a bad experience with that plan.	16.0	10.4	*	16.0	9.8	**
Premium/ Costs	Could not pay the monthly premium.	43.9	27.4	**	39.7	23.0	**
	Another plan would cost you less.	46.5	39.0	*	47.0	43.4	—
	Plan started charging a monthly premium or increased your monthly premium.	51.0	38.7	**	43.5	37.1	**

See footnotes at the end of the table.

**Table 2—Continued**

**Specific Reasons Cited for Disenrolling from Medicare Managed Care Plan, by Disability and Age Status: 2001 and 2002**

Major Reason Group	Individual Reason for Disenrollment	2001			2002		
		Disabled/ Under Age 65	Age 65 or Over	t-test	Disabled/ Under Age 65	Age 65 or Over	t-test
Premium/ Costs Copayments/ Coverage	Could not pay the monthly premium.	43.9	27.4	**	39.7	23.0	**
	Another plan offered better benefits or coverage for some types of care or services.	41.9	39.9	—	50.0	46.6	—
	Plan increased the copayment for office visits to your doctor and for other services.	33.2	24.2	**	41.7	29.5	**
	Plan increased the copayment that you paid for prescription medicines.	38.9	24.8	**	44.3	30.3	**
Drug Coverage	Maximum dollar amount the plan allowed for your prescription medicine was too low.	35.5	20.0	**	38.9	22.9	**
	Plan required you to get a generic medicine when you wanted a brand name medicine.	19.1	8.3	**	19.4	10.4	**
	Plan would not pay for a medication that your doctor had prescribed.	24.0	11.8	**	29.2	15.9	**

\*\*p = <0.01.

\*p = <0.05.

NOTES: Statistically significant differences in the propensity to cite the reason by the disabled group under age 65 and age 65 or over groups are indicated with asterisks. The null hypothesis is that the proportions are the same across under age 65 and age 65 or over populations in each year.

SOURCE: Centers for Medicare & Medicaid Services: Medicare CAHPS® Disenrollment Reasons Survey conducted by RTI International, 2001 and 2002.

We used the eight major reason groups constructed from the 2002 reasons survey as the dependent variables in the multivariate regression analysis. Eight separate logistic regression models were fit using these indicator variables as the response variable (Figure 2), and the beneficiary, plan, and market characteristics applicable to the beneficiary as the explanatory variables.<sup>4</sup>

When specifying variables to include in the multivariate models, we sought to achieve representation of each domain in the conceptual model. Using age category 65 or over as the reference group to compare with the disabled cohort (those under age 65), we interacted disabled status with three key market variables: (1) the percent poor elderly households (market demand), (2) the percent of the population living in areas underserved by primary care physi-

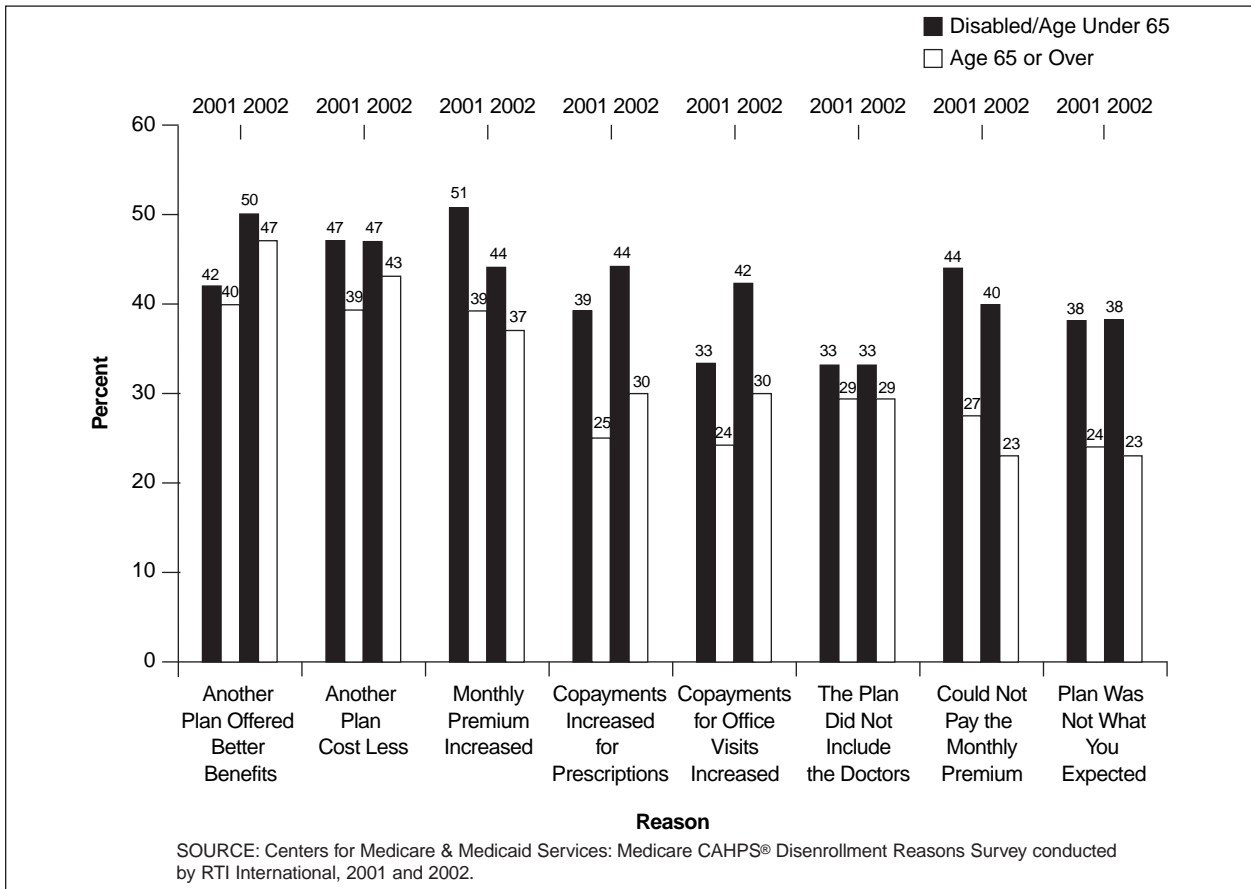
cians (PCPs) (market supply), and (3) the number of plan choice alternatives (market competition). These three market variables were included in interactions with disability status in our model, to assess whether the impact of disability status on the disenrollment reason groups cited varied with these market factors.

We expect that the disabled/plan choices interaction would reduce the probability that premium/costs reasons were cited by disabled beneficiaries, who may have less wealth and greater incentive to use plan competition to their advantage, relative to older beneficiaries. We also expect that the disabled/plan choices interaction would reduce the probability that the specific needs reason group was cited by disabled persons, if plans compete on service quality dimensions. We expect that the disabled population may fare better than the elderly population in medically underserved markets to the extent that they have better

<sup>4</sup> Plan information was linked to the beneficiary using their Medicare managed care plan and market information was linked using the beneficiary's county of address at the time of disenrollment.

Figure 1

Most Frequently Cited Reasons for Disenrolling from Medicare, by Age Groups Disabled/Under 65 and 65 or Over: 2001 and 2002



established relationships with physicians. Finally, we expect that the disabled/low income interaction would increase the probability that reasons for disenrollment were cited by the disabled group, relative to the elderly group, particularly the premium/costs reason—if the disabled beneficiaries are more impoverished than the elderly beneficiaries (who have accumulated non-monetary assets over their lifetimes).

**FINDINGS**

**Descriptive Results**

The item—plan did not include doctors or other providers you wanted to see—is among the most frequently cited. However,

the propensity to cite this reason was about the same for the disabled and elderly populations (Table 2). Inability to pay the monthly premium was cited significantly more often by disabled versus age 65-or-over beneficiaries, in both 2001 and 2002, along with the reason plan started charging a monthly premium or increased your monthly premium. Two other reasons—plan increased the copayment for office visits to your doctor and for other services and plan increased the copayment that you paid for prescription medicines—were cited more frequently by the disabled population versus age 65-or-over population in 2002.

With few exceptions, the disabled group cited individual reasons more frequently than those age 65 or over (Table 2 and



Figure 2

Major Reason Groups for Disenrolling from Medicare Cited, by Age Groups Disabled/Under 65 and 65 or Over: 2001 and 2002

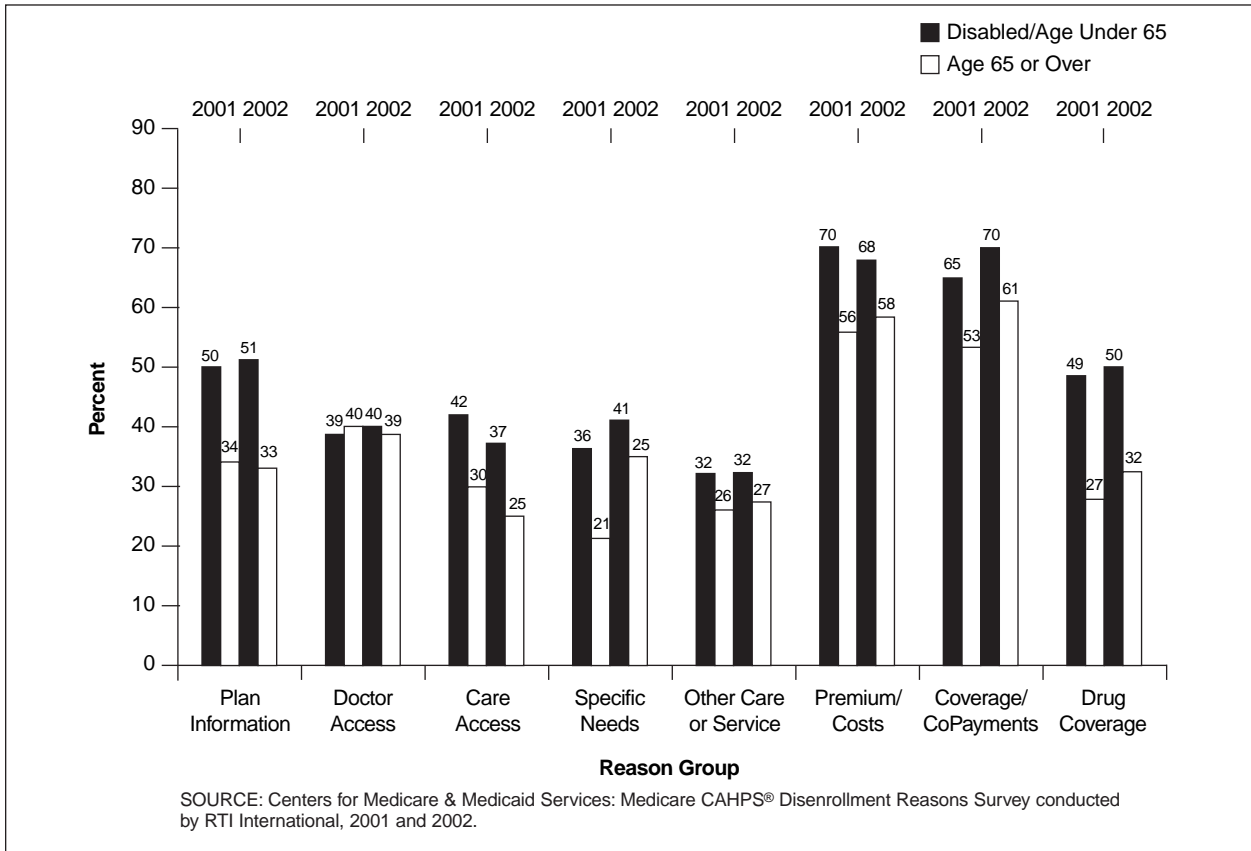


Figure 1). The three drug-coverage items were significantly more problematic for the disabled population than the age 65-or-over population in both 2001 and 2002. Only the doctor or other provider you wanted to see retired or left the plan was statistically significant and lower for disabled beneficiaries in both years (which is not surprising because older beneficiaries may be more likely to have long-term relationships with physicians than younger beneficiaries). The data also suggest that disabled beneficiaries were more likely to have multiple problems than the age group 65 or over. The disabled beneficiaries cited about two more reasons on average (six and one-half versus four and one-half) than the over age 65 population. The largest differences in the numbers of

concerns (under versus 65 or over) were regarding premiums, copayments, and the plan being not as expected.

Turning to the eight major reason groups, reasons associated with premium/cost issues and coverage/copayment issues were the most frequently cited among all beneficiaries, particularly the disabled beneficiaries (Figure 2). In 2002, 70 percent of the disabled group and 61 percent of the age group 65 or over cited reasons related to benefit structure and copayments as the leading reason for disenrolling. In the same year, 68 percent of the disabled population and 58 percent of individuals age 65 or over cited premiums-related reasons as the second most common reason for disenrolling. With the exception of

**Table 3**  
**Odds Ratios From Logistic Regression Predicting Eight Major Reason Groups Cited for Disenrolling from Medicare Managed Care (MMC) Plan, 2002**

Variable	Reason Group							
	Plan Information	Doctor Access	Care Access	Specific Needs	Other Care or Service	Premium/ Costs	Coverage/ Copayments	Drug Coverage
<b>Age</b>								
64 Years or Under	*1.26	1.11	1.09	**1.30	0.94	**1.58	1.06	**1.62
65 Years or Over <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Sex</b>								
Male	0.99	*0.87	0.89	1.01	0.95	**1.31	1.0	0.94
Female <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Race/Ethnicity</b>								
Hispanic	**1.88	0.96	*1.29	1.16	*1.33	1.1	*1.32	1.16
Non-Hispanic White <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Non-Hispanic Black	**2.13	**0.72	1.25	**1.44	1.16	**1.73	1.1	*1.23
Non-Hispanic Other	*1.55	0.97	1.29	1.12	1.21	1.15	1.19	0.74
<b>Education</b>								
≤ 8th Grade	1.0	**0.72	0.85	1.12	1.06	**1.73	1.26	*1.38
9th - 11th Grade	1.08	0.85	1.02	1.17	0.89	**1.55	*1.25	1.17
High School	1.02	0.86	0.86	1.09	0.85	**1.70	*1.24	**1.33
Some College	1.1	0.91	1.05	1.08	1.01	**1.52	**1.44	1.22
College Degree or More <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Dually Eligible Beneficiary</b>								
Yes	1.09	**0.71	0.99	1.15	0.95	**1.37	1.17	1.13
No <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Health Status</b>								
Excellent <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Very Good	1.29	1.19	1.14	1.3	1.09	**0.72	*1.31	*1.35
Good	1.28	1.12	1.15	**1.59	*1.40	*0.79	**1.46	**1.76
Fair	**1.66	1.0	**1.59	**1.99	**1.49	0.87	**1.57	**2.03
Poor	**1.61	1.08	**1.76	**2.82	**1.56	*0.73	**1.81	**1.94
<b>Disenroll to FFS or MMC</b>								
MMC	**0.71	**0.58	**0.66	0.97	**0.74	**1.81	**1.40	**1.25
FFS <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Satisfaction with Plan</b>								
0	**29.11	**1.96	**18.41	**8.45	**6.88	*1.43	**3.96	**3.77
1	**18.44	*1.56	**13.57	**9.54	**4.49	1.42	**3.12	**3.54
2	**12.59	1.34	**8.32	**5.78	**4.31	**1.71	**4.97	**3.33
3	**15.08	**1.78	**11.26	**5.84	**5.15	**1.54	**3.84	**3.73
4	**10.04	*1.36	**7.90	**4.76	**3.45	**1.83	**4.80	**3.46
5	**4.63	1.16	**4.80	**3.01	**2.23	**1.73	**3.49	**2.97
6	**3.56	1.0	**3.89	**3.19	**1.93	**1.73	**3.19	**2.80
7	**2.35	1.0	**2.86	**1.78	*1.40	**1.40	**2.41	**2.06
8	*1.34	1.0	**1.57	**1.50	*1.32	**1.43	**2.03	**1.50
9	1.18	0.85	1.37	*1.40	1.05	1.21	**1.64	1.2
10 <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Drug Coverage</b>								
No Coverage <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Some Coverage	1.04	**1.73	**1.53	*0.83	1.04	**0.71	**0.73	*1.19
Years Plan has been in Operation	0.96	1.06	**1.13	1.06	**1.10	1.01	**1.10	**1.13
Market Share of Plan	0.94	**0.85	1.05	0.95	0.99	1.06	0.99	*0.92
Private Managed Care Penetration	0.96	0.98	**0.86	0.97	1.04	1.04	1.05	*0.92
Proportion of County that is Urban	*1.10	**1.36	*1.14	1.10*	1.01	**0.75	**0.90	**1.18
Proportion of the Elderly Households with Low Income	1.02	**1.22	0.97	0.93	0.99	**0.78	*0.91	1.05
Percentage of Population Living in Designated PCP Shortage Area	**1.21	0.96	*1.11	**1.22	**1.17	**0.92	**1.30	**1.15

See footnotes at the end of the table.

**Table 3—Continued**  
**Odds Ratios From Logistic Regression Predicting Eight Major Reason Groups Cited for Disenrolling from Medicare Managed Care (MMC) Plan, 2002**

Variable	Reason Group							
	Plan Information	Doctor Access	Care Access	Specific Needs	Other Care or Service	Premium/ Costs	Coverage/ Copayments	Drug Coverage
Number of Alternative MMC Plans in the County	*1.12	*0.91	*1.13	1.04	**1.14	0.92	1.07	0.98
<b>Age Interaction With Proportion of the Elderly with Low Income</b>								
64 Years or Under	1.07	1.05	1.05	1.12	1.11	0.97	0.97	0.89
65 Years or Over <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Age Interaction With Percent Population Living in Designated PCP Shortage Area</b>								
64 Years or Under	*0.84	1.16	0.96	0.84	0.89	**0.70	0.85	*0.84
65 Years or Over <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Age Interaction With Number of Alternative MMC Plans in the County</b>								
64 Years or Under	0.94	1.02	1.09	*0.81	0.92	*0.81	1.02	0.93
65 Years or Over <sup>R</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

\*\*Significance at the 99 percent level of confidence.

\*Significance at the 95 percent level of confidence.

NOTES: The overall fit of all models is significant at better than the 99 percent level of confidence. Individual variables' significance of categorical effects relative to the omitted reference groups is indicated in the column next to the numerical estimates for each category. Reference categories for the analysis are indicated with a superscripted R. FFS is fee-for-service. PCP is primary care physician.

SOURCE: Centers for Medicare & Medicaid Services: Medicare CAHPS® Disenrollment Reasons Survey conducted by RTI International, 2001 and 2002.

doctor access issues, disabled beneficiaries under age 65 experienced more problems with the seven remaining reason groups relative to beneficiaries age 65 or over.

### Multivariate Results

The estimation results are displayed in Table 3, where the odds ratios from the logistic regressions are presented for ease of interpretation. Interaction terms included in the model are interpreted as follows: For example, a significant interaction between disability and plan choices in the premium/costs regression suggests that the effect of disability on the probability of citing that reason group depends on how many plans are available in the market—and thus varies from market to market. The best way to illustrate these interaction effects is in a table (or graph) of predicted marginal impacts, where the probabilities of the disabled population citing the reason group are shown conditional on particular

values (e.g., quartiles) from the distribution of plan choices (Korn and Graubard, 1999).

The results in Table 3 suggest that disabled beneficiaries were significantly more likely than the age group 65 or over to cite concerns within the plan information, specific needs, premium/costs, or drug coverage reason groups, holding other factors constant. However, this is not the full effect of disability status for the special needs and premium/costs regressions because there are also significant disability/plan choices interactions. In the specific needs regression (Table 3), disabled status appears to increase the odds that the reason group is cited by the disabled population relative to the elderly group, when there are few plans in the county (odds ratio 1.30). Due to the significant interaction, this effect decreases as the number of plan choices increase (odds ratio 0.81). This suggests that in more competitive markets, the gap between disabled and elderly persons in citing this

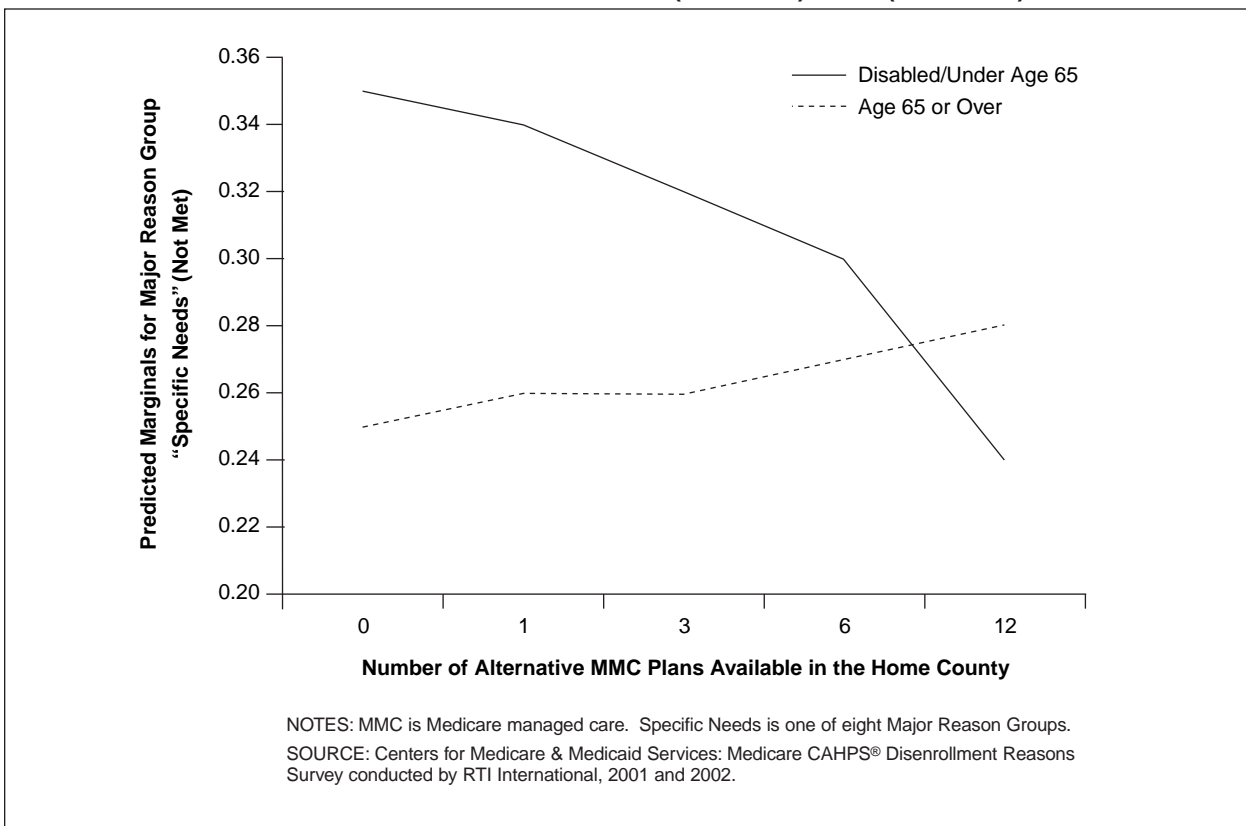
**Table 4**  
**Predicted Marginal Probabilities (Proportions) Citing Two Major Reason Groups, by Disabled Status and Number of Alternative MMC Plans Available in the Home County: 2002**

Percentile	Number of Alternative MMC Plans Available in the Home County	Specific Needs Group		Premium/Costs Group	
		Disabled/ Under Age 65	Age 65 or Over	Disabled/ Under Age 65	Age 65 or Over
0	0	0.35	0.25	0.76	0.60
25	1	0.34	0.26	0.74	0.60
50	3	0.32	0.26	0.71	0.59
75	6	0.30	0.27	0.66	0.57
100	12	0.24	0.28	0.55	0.53

NOTE: MMC is Medicare managed care.

SOURCE: Centers for Medicare & Medicaid Services: Medicare CAHPS® Disenrollment Reasons Survey conducted by RTI International, 2001 and 2002.

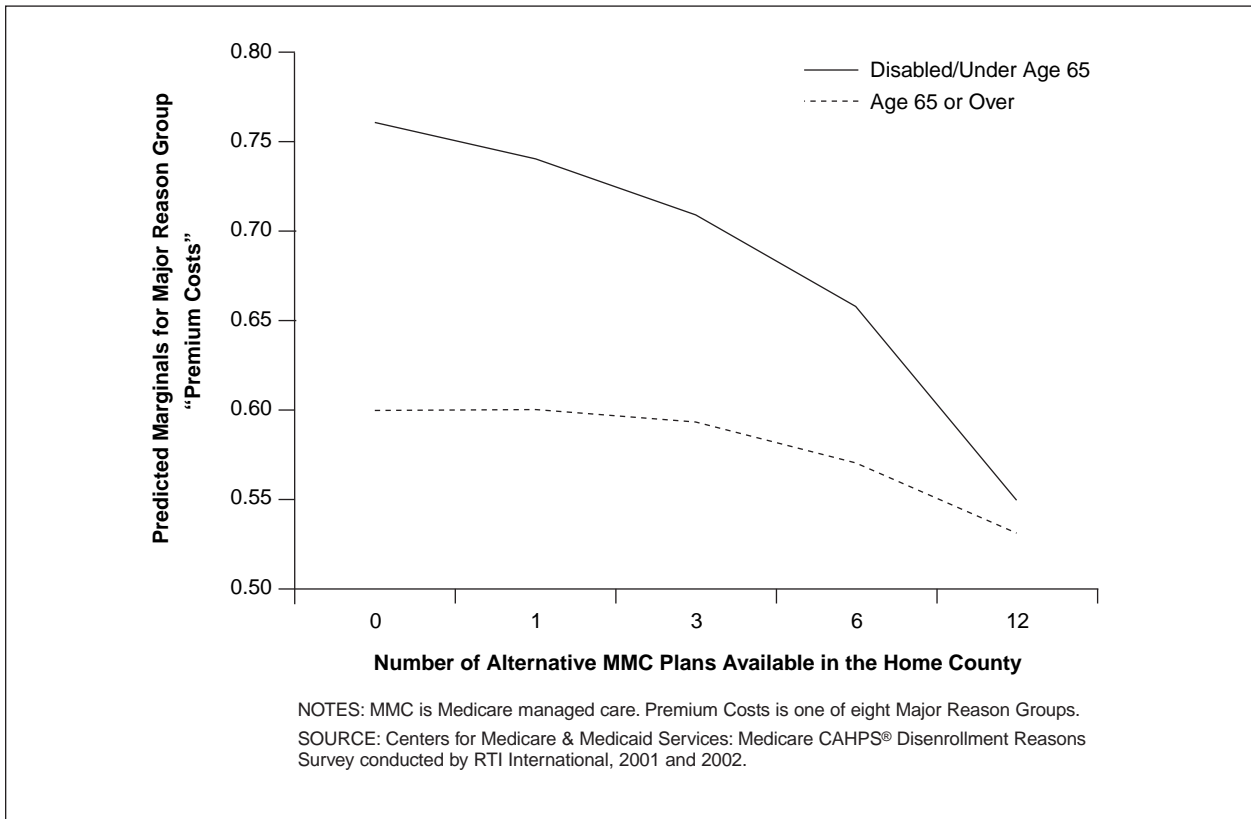
**Figure 3**  
**Propensity to Cite the Specific Needs Reason Group, by Disability Status as Number of Alternative MMC Plans Increases from 0 (Minimum) to 12 (Maximum): 2002**



reason group is lower—and that plans may compete by providing better quality care to the disabled population. The variation in the effect of disability status with plan choices in the specific needs regression is shown in Table 4, using the minimum, lower quartile, median, upper quartile, and maximum values from the plan-choices distribution, and graphed in Figure 3. With no plan choice, 35

percent of the disabled group and 25 percent of the elderly group are expected to cite the specific needs category as a reason for leaving. Similarly, the premium/costs regression results (Table 3) suggest that this reason group is significantly more likely to be cited by the disabled group than the elderly group when there are few plans in the county (odds ratio 1.58). Due to the

**Figure 4**  
**Propensity to Cite the Premium/Costs Reason Group, by Disability Status as Number of Alternative MMC Plans Increases from 0 (Minimum) to 12 (Maximum): 2002**



significant interaction, this effect decreases as the number of plan choices increases (odds ratio 0.81). The variation in the effect of disability status with plan choices in the premium/costs regression is shown in Table 4, and graphed in Figure 4. Thus, as expected, we find that the disabled beneficiaries seem to benefit more from plan competition, which manifests as fewer problems with specific needs not being met or premium/costs problems, as competition intensifies.

The second interaction included in the model—the disabled/medically underserved areas interaction—was significant in the plan information (Table 3), premium/costs and drug coverage reason groups. In all three regressions, the disabled population appears to be more likely to cite the reason group than the elderly

group when the percent of population living in underserved areas is low. Due to the significant interaction, this effect decreases as the percent of population living in underserved areas increases. However, for the elderly, the propensity to cite plan information and drug coverage problems increases as the percent of population living in underserved areas increases.<sup>5</sup> So, as the percent population living in underserved areas increases, the propensity for citing these reason groups increases for the elderly population, but not for the disabled population. These findings are as expected if the disabled group have better established relationships with physicians than the elderly group.

<sup>5</sup> These effects are the significant odds ratios (1.21, 1.15) which are interpreted as the impacts on the age group 65 or over when this sort of interaction is included in the model (Korn and Graubard, 1999).



The third interaction included in the model—the disabled/low income interaction—was not significant for any of the major reason groups. This finding suggests that income level does not have a differential impact on reasons cited by the disabled group versus the elderly group. Generally speaking, higher income has been found to be associated with better accessibility in the literature, so we expected that higher income would be associated with lower probability of citing the access-related reasons. Perhaps a better measure of income, at the beneficiary level, would have the expected effects.

Other plan and market variables included in the analysis may have effects of interest. Disenrollees who went to another Medicare managed care plan (rather than to FFS) were more likely to cite concerns about premium/costs, coverage/copayment, or drug coverage, but less likely to cite plan information, care access, doctor access, or other care or service as reasons for leaving. Beneficiaries in plans with some drug coverage (compared with none) were more likely to cite doctor access, care access, and drug coverage problems, but less likely to cite premium/costs, coverage/copayment, or specific needs as reasons for disenrolling. Beneficiaries who disenrolled from plans with longer tenure in the Medicare managed care program were more likely to cite care access, other care or service, coverage/copayments, and drug coverage problems. Beneficiaries who left plans with a larger market share were less likely to report doctor access or drug coverage as reasons for leaving.

## **DISCUSSION OF FINDINGS**

The Medicare disenrollment reasons survey is a nationwide survey designed to shed light not only on who chooses to

leave Medicare managed care plans, but also why beneficiaries leave. Not surprisingly, five of the six leading reasons for leaving cited by both the disabled and the aged groups are related to some aspect of the economic tradeoff faced by all who buy insurance, i.e., trying to minimize premiums and cost sharing while maximizing benefits. However, this analysis extends our understanding beyond this fairly simple economic concept to a more detailed understanding of the factors that impact Medicare beneficiaries' disenrollment from Medicare managed care plans.

Overall, cost and coverage issues were the leading factors driving beneficiaries' decisions to disenroll from their health plan. Having access to preferred doctors was the most common access-related reason cited. From the descriptive analysis it appears that the disabled beneficiaries were more likely to cite problems with access to care or problems with care or service more frequently than those age 65 or over, but this finding was not supported when we controlled for the various market characteristics and interactions between key market variables and disability status. Despite the tendency for the under age 65 disabled population to cite more reasons for leaving overall, they do not appear to be leaving plans due to problems accessing care any more frequently than the aged population. However, this finding is not applicable to other vulnerable subgroups, such as racial and ethnic minorities and those reporting only fair or poor health, who did show a greater propensity than their less vulnerable counterparts to cite access problems as reasons for disenrollment. Several minority subgroups were also more likely to cite information problems than non-minority disenrollees. The most frequently cited reason with the plan information reason group was that after joining the plan, the disenrollee found that it was not what he or she expected.

While we found no significant difference between the disabled and the aged groups in terms of citing access problems as reasons for leaving, the multivariate analysis revealed that the disabled beneficiaries were more likely than the age 65 or over population to cite problems with Drug Coverage and Plan Information. However, this gap narrowed in markets increasingly underserved by PCPs, suggesting that the disabled group may be advantaged by their better established relationships with physicians in more underserved regions, relative to the elderly beneficiaries. Our findings also suggest that the disabled group is more likely to have unmet special needs or concerns about premium/costs than the elderly group, particularly in less competitive markets. However, the gap between the disabled and the elderly groups appears to narrow with plan competition, which bodes well for the disabled beneficiaries in the new era of expanded plan choices. Yet, when faced with too many choices, people may opt not to make any (Iyengar and Lepper, 2000), i.e., beneficiaries will tend to stay in FFS or their current Medicare managed care plan, regardless of what other alternatives are available.

On average, about 10 percent of Medicare managed care enrollees voluntarily disenrolled from their Medicare managed care plan during 2001 or 2002, and about 10 percent of them were under 65 and disabled. Since, on average, only 7 percent of Medicare managed care enrollees are under 65 and disabled, this means that disabled beneficiaries are leaving Medicare managed care plans at a proportionally higher rate than aged enrollees. Thus, even though our findings suggest that the disabled enrollees are not adversely impacted by increased competition relative to the elderly beneficiaries and not experiencing worse access problems, their higher overall Medicare managed

care disenrollment rate is of concern. This would be especially troubling if the disabled group always disenrolled to FFS rather than to another Medicare managed care plan, which would suggest that, despite their ties with physicians, managed care does not work as well for them as FFS. Examining the data on plan choice postdisenrollment, we find that in markets where there was more than one Medicare managed care plan available, the disabled group returned to another FFS plan about 54 percent of the time, as compared with the elderly group, who returned to FFS about 47 percent of the time, so neither group seems to be abandoning managed care.

Taken together, these findings suggest that the disabled enrollees may benefit from policy reforms which increase competition among Medicare managed care plans if they can continue to see their preferred physicians and take advantage of the ability to comparison shop for better plans. A key component of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) is restructuring and expanding Medicare managed care options available to beneficiaries. As legislated, in addition to the local Medicare managed care plans that have been available since the late 1970s, the Medicare Advantage program, formerly known as Medicare+Choice, will begin offering regional PPO plans in 2006, enhancing beneficiary choice of Medicare managed care plans throughout the country and relaxing restrictions on choice of physicians in Medicare managed care plans.

Two upcoming policy changes stemming from this reform may impact the disabled population in opposite ways—the emergence of the PPO plan options and establishment of plan lock in. PPO plans will offer beneficiaries the ability to use providers outside the plan's preferred

panel with some cost sharing, as compared with more traditional Medicare managed care plans where no coverage is given for providers outside the panel. This greater flexibility is expected to make managed care more attractive to beneficiaries with established physician relationships.

Regarding lock in, most private insurance for the employed population is based on a once-a-year open enrollment period when plan enrollees receive information about premiums and benefits for the upcoming year. Except in certain situations, most enrollees can only make disenrollment decisions during that one time of the year. In contrast, Medicare managed care enrollees have been allowed to leave their plan and go to another Medicare managed care plan (if available) or to a traditional FFS plan at the end of any month in the year. The option to shop around seems important for both disabled and elderly beneficiaries. If implemented,<sup>6</sup> the new lock in provisions would reduce opportunities to disenroll as a potential remedy for those who have problems accessing care within a specific plan.

## LIMITATIONS OF THE ANALYSIS

Perhaps the most important limitation of this analysis is that beneficiaries can cite as many of the 33 reasons for disenrolling stated in the survey as they feel are applicable, thus the same beneficiary can be represented in multiple major reason groups. The resulting dependence across equations may be reflected in our findings. However, we have conducted parallel analysis using the most important reason groups, which allow the beneficiary to be represented only once in the analysis

<sup>6</sup> Although the Balanced Budget Act of 1997 originally called for a similar lock-in requirement for Medicare managed care enrollees, scheduled to go into effect in 2006, the implementation of this policy has been postponed twice.

(Mobley, L., McCormack, L., Booske, B., et al., 2004) and our findings were quite comparable.

Another limitation is that the sample respondents were weighted based on a blend of sample design (plan size) and response propensity weights. The plan size weights adjust for the fact that with different size plans, the 388 persons surveyed represent different proportions of the total number of disenrollees. The propensity weights adjust for the fact that some subgroups are underrepresented. Thus, there is the possibility that the survey respondents are not fully representative of the larger population of all disenrollees, and this discrepancy may be greater for persons in smaller subgroups and larger plans.

Beyond the lack of detailed benefits information, another limitation of this analysis is the lack of data about individual income levels, and the lack of detailed data about particular disability levels in the disabled population. Finally, while we tried to account for a number of market factors in this analysis, we were not able to include all potential market characteristics. For example, between 1999 and 2003, over two million beneficiaries were enrolled in plans that either withdrew from the Medicare program or cutback their service areas, creating an important climate that we could not fully capture. While we accounted for the number of alternative coordinated care plans available to beneficiaries, we could not capture the instability and insecurity regarding managed care that arose in these markets. For those who can afford supplemental insurance, this may appear a viable alternative, but for vulnerable subgroups such as the disabled population, the lack of another managed care option may result in a decision not to leave a managed care plan even if dissatisfied. Taking market factors into consideration in looking at these decisions will continue to be important as Medicare

managed care markets continue to change, particularly after the MMA's expansion of PPOs and drug coverage in 2006.

## ACKNOWLEDGMENTS

We would like to acknowledge the efforts of other team members at RTI who helped with the analytic file construction, survey, statistical analysis, and reviews of this work: Randall Bender, Scott Scheffler, Anne Kenyon, Millie Duke, and Shulamit Bernard.

## REFERENCES

- Aday, L.A. and Andersen, R.: A Framework for the Study of Access to Medical Care, *Health Services Research* 9:208-220, Fall 1974.
- Boxerman, S. and Hennelly, V.: Determinants of Disenrollment: Implications for HMO Managers. *Journal of Ambulatory Care Management* 6(2):12-23, May 1983.
- Brown, R.S., Clement, D.G., Hill, J.W., et al.: Do Health Maintenance Organizations Work for Medicare? *Health Care Financing Review* 15(1):7-23, Fall 1993.
- Buchmueller, T.C.: The Health Plan Choices of Retirees Under Managed Competition. *Health Services Research* 35(5):949-976, December 2000.
- Burstin, H.R., Swartz, K., O'Neil, A.C., et al.: The Effect of Change of Health Insurance on Access to Care. *Inquiry* 35(4):389-397, Winter 1998/1999.
- Centers for Medicare & Medicaid Services, Office of Research, Development, and Information: Program Information on Medicare, Medicaid, SCHIP, and Other Programs of the Centers for Medicare & Medicaid Services. *Online CMS Chart Series, Chart III B: "Profile of Medicare Beneficiaries."* June 2002. Internet address: <http://cms.hhs.gov/charts/default.asp>. (Accessed March, 2005.)
- Cox, D., Lanyi, B., and Strabic, A.: Medicare Health Maintenance Organization Benefits Packages and Plan Performance Measures. *Health Care Financing Review* 24(1):133-144, Fall 2002.
- Dallek, G. and Swirsky, L.: Comparing Medicare HMOs: Do They Keep Their Members? Families USA Foundation. Washington, DC. December 1997.
- Iyengar, S. and Lepper, M.: When Choice is Demotivating: Can One Desire Too Much of a Good Thing? *Journal of Personality and Social Psychology* 79(6):995-1006, December 2000.
- Khan, A.A. and Bhardwaj, S.M.: Access to Health Care: A Conceptual Framework and Its Relevance to Health Care Planning. *Evaluation and the Health Professions* 17(1):60-76, March 1994.
- Korn, E.L. and Graubard, B.I.: *Analysis of Health Surveys*. John Wiley & Sons, Inc. New York 1999.
- Lewis, A.: What Buyers Should Ask About Quality, *Business & Health* 10(12):64-65, October 1992.
- Lied, T., Sheingold, S., Landon, B., et al.: Beneficiary Reported Experience and Voluntary Disenrollment in Medicare Managed Care. *Health Care Financing Review* 25(1):55-66, Fall 2003.
- Mello, M.M., Stearns, S.C., Norton, E.C., et al.: Understanding Biased Selection in Medicare HMOs. *Health Services Research* 38(3):961-992, June 2003.
- Meng, Y., Gocka, I., Leung, K., et al.: Disenrollment from an HMO and Its Relationship with the Characteristics of Medicare Beneficiaries. *Journal of Health Care Finance* 26(2):53-60, Winter 1999.
- Mobley, L., McCormack, L., Booske, B., et al.: *Analysis of the Medicare CAHPS® 2001 Disenrollment Reasons Survey*. Centers for Medicare & Medicaid Services (RTI Final Report 7659.005). Research Triangle Institute. February 2004.
- Morgan, R.O., Virnig, B.A., DeVito, C.A., et al.: Medicare HMO Disenrollment and Selective Use of Medical Care: Osteoarthritis-related Joint Replacement. *American Journal of Managed Care* 6(8):917-923, August 2000.
- Newhouse, J.P.: Switching Health Plans to Obtain Drug Coverage. *Journal of the American Medical Association* 283(16):2161-2162, April 26, 2000.
- Pope, G.C., Kautter, J., Ellis, R., et al.: Risk Adjustment of Medicare Capitation Payments Using the CMS-HCC Model. *Health Care Financing Review* 25(4):119-141, Summer 2004.
- Rector, T.S.: Exhaustion of Drug Benefits and Disenrollment of Medicare Beneficiaries from Managed Care Organizations. *Journal of the American Medical Association* 283(16):2163-2167, April 26, 2000.
- Riley, G., Feuer, E., and Lubitz, J.: Disenrollment of Medicare Cancer Patients from Health Maintenance Organizations. *Medical Care* 34(8):826-836, August 1996.



Riley, G., Ingber, M., and Tudor, C.: Disenrollment of Medicare Beneficiaries from HMOs. *Health Affairs* 16(5):117-124, September/October 1997.

Riley, G., Tudor, C., Chiang, Y., et al.: Health Status of Medicare Enrollees in HMOs and Fee-for-Service in 1994. *Health Care Financing Review* 17(4):65-76, Summer 1996.

Rossiter J., Langwell, K., Wan, T., et al.: Patient Satisfaction Among Elderly Enrollees and Disenrollees in Medicare Health Maintenance Organizations: Results from the National Medicare Competition Evaluation. *Journal of the American Medical Association* 262(1):57-63, July 7, 1989.

Research Triangle Institute: Implementation of the Medicare CAHPS Fee for Service Survey Project. Centers for Medicare & Medicaid Services. Research Triangle Institute, 2003.

Sainfort, F., and Booske, B.C.: Role of Information in Consumer Selection of Health Plans. *Health Care Financing Review* 18(1):31-54, Fall 1996.

Schlesinger, M., Druss, B., and Thomas, T.: No Exit? The Effect of Health Status on Dissatisfaction and Disenrollment from Health Plans. *Health Services Research* 34(2):547-576, June 1999.

Town, R. and Liu, S.: The Welfare Impact of Medicare HMOs. *RAND Journal* 34(4):719-736, Winter 2003.

U.S. General Accounting Office: Medicare Managed Care: HCFA Missing Opportunities to Provide Consumer Information. Testimony before the Special Committee on Aging, U.S. Senate. April GAO/T-HEHS-97-109, 1997. Internet address: <http://www.gao.gov/archive/1997/he97109t.pdf>. (Accessed April 2005.)

U.S. General Accounting Office: Medicare: HCFA Should Release Data To Aid Consumers, Prompt Better HMO Performance. Report to Congressional Requesters. October GAO/HEHS-97-23, 1996. Internet address: <http://www.gao.gov/archive/1997/he97023.pdf>. (Accessed April 2005.)

Virnig, B., Morgan, R., DeVito, C., et al.: Medicare HMOs: Who Joins and Who Leaves? *American Journal of Managed Care* 4(4):511-518, April 1998.

World Health Organization-Management Sciences for Health: Defining and Measuring Access to Essential Drugs, Vaccines, and Health Commodities. *Report of the WHO-MSH Consultative Meeting, Ferney-Voltaire, France, 11-13 December 2000*. World Health Organization and Management Sciences for Health, 2000.

---

Reprint Requests: Lee Mobley, Ph.D., RTI International, P.O. Box 12194, 3040 Cornwallis Road, Research Triangle Park, NC 27709-2194. E-mail: [lmobley@rti.org](mailto:lmobley@rti.org)