ORIGINAL RESEARCH

Prescription Coverage, Use and Spending Before and After Part D Implementation: A National Longitudinal Panel Study

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BACKGROUND: In January 2006, 43 million Medicare beneficiaries became eligible for subsidized prescription coverage (Part D) through Medicare. To date, no longitudinal study has afforded information on beneficiaries' prescription coverage transitions and corresponding changes in prescription use and spending.

OBJECTIVE: To evaluate changes in Medicare beneficiaries' prescription coverage, use and spending before and after Part D implementation, including comparison of those who enrolled in Part D with those who did not.

DESIGN, SETTING AND PARTICIPANTS: Longitudinal observational study of non-institutionalized Medicare beneficiaries aged 65 and older (n=9,573) employing administrative data from the Centers for Medicare and Medicaid Services (CMS) and survey-based data from beneficiaries (2003, 2006). Sampling drew from a 1% national probability sample (2003), oversampling low-income beneficiaries including those dually-enrolled in Medicare and Medicaid.

MEASUREMENTS & MAIN RESULTS: Number and type of prescriptions, monthly out-of-pocket prescription spending, and cost-related non-adherence to prescription regimens. Most respondents who lacked prescription coverage in 2003 had acquired it by 2006 (82.6%)—primarily through Part D (63.1%). Part D enrollees who previously lacked coverage or had Medigap coverage appear particularly advantaged by Part D, as evidenced by significantly increased prescription use, lower out-of-pocket spending and lower non-adherence. Those with employer-based coverage experienced significantly increased spending. Among those still lacking coverage in 2006, high rates of cost-related non-adherence (31.8%) were reported by the low-income, chronically ill subgroup.

CONCLUSIONS: In its first year, Part D coverage appears to have moderated prescription spending and cost-related burden for those who previously had meager benefits or none. Increased spending among those with employer-based coverage may reflect a narrowing of those benefits over this period. Evidence of foregone care among low-income, chronically ill seniors who still lack prescription coverage highlights the importance of targeted outreach to this group for Part D's low-income subsidy program.

KEY WORDS: Medicare Part D; medication adherence; prescription drug use.
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INTRODUCTION

The introduction of the Medicare prescription drug benefit represents the largest expansion of Medicare benefits since the program's inception in 1966. In January 2006, 43 million Medicare beneficiaries became eligible for subsidized prescription coverage through Medicare Part D. To obtain the coverage, beneficiaries could enroll in either a stand-alone prescription drug plan (PDP) or a Medicare Advantage Prescription Drug plan (MA-PD). The program aimed to reduce the number of beneficiaries without prescription coverage and make prescription drugs more affordable for Medicare beneficiaries. The importance of doing so, in the face of the increasing financial burden associated with prescription medicines, has been well documented[1–5].

By the end of 2006, more than half of all Medicare beneficiaries (22.5 million) were enrolled in a Part D plan, according to the Centers for Medicare and Medicaid Services (CMS)[6]. Of these, 8.6 million were receiving additional assistance through the low-income subsidy program (LIS). Most LIS enrollees (6.3 million) transitioned from Medicaid, as required by law, but others applied directly and were deemed eligible (2.3 million). Another 15 million beneficiaries (34%) had other sources of comparable prescription coverage ("creditable coverage"), mainly through employer-sponsored plans[6]. Thus, by the end of 2006, nearly 90% of all Medicare beneficiaries reportedly had Part D or another source of prescription coverage, while only three years earlier, about one-quarter of seniors reported no prescription drug coverage[3].

To date, several studies have employed claims data from large pharmacy chains to evaluate changes in prescription use and out-of-pocket spending among Part D enrollees[7–9], one study reported early experiences of Part D enrollees[10,11], and one study reported population-level changes

in medication non-adherence before and after Part D implementation[11], However, to our knowledge, no study has afforded longitudinal information on the specific coverage transitions and associated outcomes of a national sample of Medicare beneficiaries before and after Part D implementation. This study reports on the prescription coverage, use and spending of a longitudinal panel of Medicare beneficiaries aged 65 and older for the period 2003 through 2006. With beneficiary-level information on specific coverage changes, the study compares the experiences of those who transitioned into Part D with those who did not, and among Part D enrollees, compares the experiences of important subgroups, including those who transitioned to Part D from no prior drug coverage, from Medicaid, from private Medigap plans and from employer-sponsored coverage. Finally, we examine the characteristics and experiences of those who lacked prescription coverage throughout the study period.

METHODS

Study Design and Participants. A 1% probability sample of non-institutionalized Medicare beneficiaries age sixty-five or older was provided by the CMS for sampling in 2003. For each beneficiary, the file included a Medicaid buy-in code indicating whether the individual was receiving full or partial Medicaid coverage. As detailed elsewhere[3,10], a random starting sample (n=36,901) was drawn across the following three strata: (1) beneficiaries with full Medicaid benefits (25%), (2) beneficiaries without Medicaid living in high-poverty neighborhoods (50%), and (3) beneficiaries without Medicaid residing outside of high-poverty neighborhoods (25%). Low-income neighborhoods (stratum 2) were identified through geocoding, linking CMS data to 2000 U.S. Census data, and employing census block group (CBG) level data to designate beneficiaries residing in neighborhoods wherein at least 13% of those aged sixty-five or older had incomes below the federal poverty level (FPL)[3,10],

In 2006, CMS provided updated information for all 2003 respondents, including vital status, 2006 Medicaid buy-in codes and history, and Medicare Advantage enrollment status and dates. We approached all surviving respondents (n= 15,274), along with 15,726 others in an augmented longitudinal design. Data were collected in English and Spanish from 5 October to 20 December 2006 using a five-stage protocol that included mail and telephone and was identical to the 2003 protocol.[12] To support longitudinal analyses, survey item content and sequencing remained largely unchanged from 2003 to 2006. (A copy of the survey is available upon request).

Analyses reported here are limited to longitudinal survey respondents (n=9,573). Cross-sectional findings based on the full 2006 sample have been previously reported.[10] The unadjusted response rate for the longitudinal panel was 62.7% (9,573/15,274). Analysis of 2006 non-response showed non-response to be moderately related to socio-demographic factors (e.g., race, age), and unrelated to substantive variables of interest (e.g., prescription coverage, use, spending). Non-response effects were thus controlled in multivariate analyses by inclusion of the relevant socio-demographic variables.

Defining Primary Analytic Variables

Prescription Coverage. For seniors reporting more than one source of prescription coverage, a primary coverage source was assigned for each year based on a coverage hierarchy[1,13], The 2003 coverage hierarchy was as follows: Medicaid, employer-sponsored, Medicare Advantage, Medigap/other private, state prescription program, Veteran's Administration, and other. The 2006 coverage hierarchy was: Part D, employer-sponsored, Veteran's Administration, and other. A combination of CMS administrative data and survey data enabled us to differentiate between seniors enrolled in stand-alone Part D plans and Medicare Advantage prescription drug plans. Beneficiaries indicated by CMS as having full Medicaid coverage were classified as having Medicaid prescription coverage in 2003 and Part D in 2006, even if the individual did not self-report Medicaid.

Poverty Status. We used the 2003 and 2006 federal poverty thresholds, respectively, together with self-reported income and marital status to classify seniors into poverty groups in each year of the study, employing a similar approach to that used in the Medicare Current Beneficiary Survey (MCBS). For approximately 12% of respondents with missing income data, income was imputed based on Buck's Method[14].

Prescription Use and Spending. The 2003 and 2006 surveys contained an identical module of questions concerning prescription medication use and spending. The methodology, based on extensive cognitive testing and applied in our work since 2001, asks respondents to report their use and out-of-pocket spending for each of five major categories of prescription medications: pills, inhalers, eye drop, skin creams or patches, and injections. For each medicine category, respondents indicate their monthly expenditures using categorical response options as follows: nothing; $0.50–$20; $21–$50; $51–$75; $76–$100; $101–$300; more than $300. Derived variables used in these analyses combine reported spending across each category to denote whether the individual spends more than $100 and $300 per month on prescriptions.

Non-Adherence. Cost-related non-adherence was evaluated with previously validated questions about the following behaviors: (i) not filling a prescription because of cost; (ii) taking smaller doses to make a prescription last longer; (iii) skipping doses to make a prescription last longer. These items have been shown to produce reliable, stable and valid estimates of cost-related medication non-adherence and were incorporated into the MCBS in 2004[1,3,15,16].

Statistical Analyses. Using the longitudinal sample (n=9573), we evaluated prescription coverage transitions from 2003 to 2006, and the role of prescription coverage source on utilization and spending. We started with three broad coverage categories: seniors who transitioned to Part D plans; seniors with a consistent drug coverage source in 2003 and 2006 (employer or VA); and seniors without drug coverage in both 2003 and 2006. Among Part D enrollees, we compared those who, in 2003, had no coverage, Medicaid, HMO,

Medigap/other private coverage, or employer coverage. Both unadjusted and adjusted changes in prescription medication use, out-of-pocket spending and cost-related non-adherence were compared. Adjusted results for utilization were based on models controlling for baseline sociodemographic characteristics and health status (age, sex, race, education, poverty status, chronic conditions), and changes from 2003 to 2006 in poverty status, chronic conditions, prescription coverage status and sources. Models of spending and cost-related non-adherence controlled for the same set of covariates and additional terms denoting the number of prescription medications reported in 2003, and the change in the number of medications reported 2003–2006.

Probability sampling weights were applied to all analyses to correct for unequal sampling probabilities across states and strata. The statistical software used (STATA 7.0) takes these weights into account when computing standard errors.

RESULTS

Transitions in Prescription Coverage Status and Source, 2003–2006. Overall, 92.5% of the longitudinal panel reported having prescription coverage in late 2006, with nearly half (47.5%) enrolled in a Part D plan (Table 1). Among the 25.7% of seniors who lacked prescription coverage in 2003 (row 1), the majority (63.1%) had enrolled in Part D benefits by late 2006. Part D take-up was also high among those who previously had prescription coverage through Medicaid (94.2%, row 2), an HMO (78.2%, row 3), or Medigap/other private plans (50.2%, row 4).

Among those with prescription coverage through an employer in 2003 (row 5), most (69.5%) still reported employer-based prescription plans in 2006. This somewhat understates the total group still receiving employer-based coverage, as more than half of those now reporting Part D coverage in 2006 also indicated that their employer provides support for their prescription plan (n=372). Taken together, the findings suggest that 82% of those with employer-sponsored prescription coverage in 2003 continued to have employer supported prescription coverage in 2006. This is consistent with employer surveys conducted around the time of Part D implementation, which found the vast majority of employers intending to continue supporting prescription drug coverage[17], though many significantly increased cost-sharing requirements[18].

Sociodemographic and Health Profiles of Prescription Coverage Subgroups. Compared with those in Part D plans in 2006 (n=5171), those who retained employer-based prescription plans (n=1882) were younger, disproportionately white, and had more education, higher incomes, and fewer chronic conditions (p<0.001) (Table 2). Those who transitioned from employer-based prescription plans to Part D (n=649) were significantly more likely to be of minority race/ethnicity, lower income, and to be somewhat sicker (i.e., more chronic conditions, higher prescription medication use) than those retaining employer coverage (p<0.05).

Similarly, those who remained without prescription coverage throughout the study period (n=476) appear healthier than those who transitioned from no coverage into a Part D plan (n=1619)—with approximately one-third of the former reporting no chronic conditions (35.0%), compared with only 10.6% of the latter.

Prescription Use and Out-Of-Pocket Spending, 2003–2006. Among seniors in Part D plans, all subgroups except those previously enrolled in Medicaid reported somewhat increased prescription use (Table 3). Increased use was statistically significant for those who transitioned to Part D from no coverage and from Medigap (unadjusted and adjusted models, p<0.001).

All Part D subgroups, except those previously reporting employer-based coverage, reported lower out-of-pocket spending in 2006 than 2003. In adjusted models, the odds of spending more than $100 per month on prescriptions were significantly reduced for Part D enrollees who previously lacked coverage (OR=0.3, p<0.001). Those who transitioned from Medicaid drug coverage also showed significantly reduced odds of spending more than $100 per month (OR=0.5, p<0.05) and more than $300 per month (OR=−6.2, p<0.01).

Those with employer-based prescription coverage in 2003 experienced significantly higher out-of-pocket spending in 2006, irrespective of whether they retained employer-sponsored coverage or transitioned to Part D. The odds of spending more than $100 per month were approximately two-times higher for both groups in 2006 compared with 2003 (OR=1.9 and 2.2, respectively, p<0.001) after controlling for changes in health status, medication use, and other factors. Results were not sensitive to reassignment of those reporting both employer and Part D coverage in 2006 to the group with 2006 employer-sponsored coverage.

Cost-Related Non-Adherence to Prescription Regimens, 2003–2006. Overall, as reported by Madden et al.,[11] cost-related non-adherence declined significantly among seniors between 2003 and 2006 (26.0% to 19.4%, p<0.001) (Table 4). Among Part D enrollees, three subgroups showed significant declines in cost-related non-adherence: those previously lacking prescription coverage, and those previously covered through either a Medicare HMO or a Medigap/private plan. By contrast, those who transitioned from employer-based prescription coverage to Part D plans reported significantly higher rates of cost-related non-adherence in 2006 (OR=1.7, p<0.01). Those who retained employer-based prescription coverage in both periods continued to report the lowest overall rates of cost-related nonadherence, and showed somewhat lower rates in 2006 compared with 2003 (OR=0.7, p<0.05).

Characteristics of Seniors Without Prescription Coverage in Both 2003 and 2006. Seniors who remained without prescription coverage from 2003 to 2006 differ significantly from seniors overall and from Part D enrollees (Table 5). They appear significantly less engaged with the health care system overall—less likely to have a primary care physician (p<0.001), to have seen any physicians in the past year (p<0.001) or to take any medications (p<0.001). While some of this may be attributable to their relatively good health, subgroup analyses reveal important distinctions. The largest subgroup of those persistently without drug coverage are low-income, chronically ill seniors (n=170), who show significant financial strain related

Table 1. Prescription Coverage Transitions from 2003 to 2006

Source of Rx Coverage in 2003 (Column sums to 100%)			Source of Rx Coverage in 2006 (Rows sum to 100%)						
	Total		Part D			Employer (n=2576)	VA (n=296)	Other (n=760)	None (n=770)
			Total (n=5171)	PDP (n=3635)	MAPD (n=1536)				
Total (n=9573)	100.0%	→	47.5%	33.0%	14.5%	31.8%	4.3%	8.9%	7.5%
None (n=2538)	25.7%	→	63.1%	49.6%	13.5%	6.7%	3.2%	9.6%	17.4%
Medicaid (n=1172)	5.2%	→	94.2%	78.4%	15.8%	2.6%	0.5%	2.7%	0.0%
HMO (n=917)	8.8%	→	78.2%	5.5%	72.7%	4.4%	4.1%	8.8%	4.5%
Medigap/Other Private (n=1641)	19.8%	→	50.2%	46.3%	3.9%	24.3%	2.4%	15.5%	7.6%
Employer (n=2753)	34.4%	→	21.6%[a]	13.7%	7.9%	69.5%	0.9%	5.2%	2.8%
VA (n=309)	3.9%	→	22.0%	18.0%	4.0%	20.2%	56.2%	0.6%	1.0%
State (n=214)	2.1%	→	55.2%	52.9%	2.3%	2.3%	6.3%	30.0%	6.2%
Other Public (n=29)	0.1%	→	74.2%	60.5%	13.7%	12.9%	4.0%	7.2%	1.7%

Weighted using 2003 sampling weights

[a]*Among those who reported employer coverage in 2003 and Part D coverage in 2006, 58% (N=372) still report employer coverage in 2006. Because our coverage hierarchy treats Part D as primary, these individuals appear in the Part D category despite also having employer-based Rx coverage. However, if these individuals were assigned to 2006 employer Rx coverage, the results would reveal that 82.1% of those with employer-based Rx coverage in 2003 still had employer-based Rx coverage in 2006 (as opposed to 69.5% shown above)*

to health care. Within this subgroup, nearly one-quarter report having forgone physician care in the past year due to cost (22.1%, $p<0.001$) and 9.9% reporting that they did not seek hospital care when needed due to concern about the associated out-of-pocket costs ($p<0.01$). This subgroup is significantly more likely than the overall sample to spend more than $100 per month on prescriptions (38.0%, $p<0.05$) and to report cost-related non-adherence (31.8%, $p<0.001$). While the potential value of financial assistance with prescription costs is apparent for this subgroup, few report having applied for the Part D low-

Table 2. Demographic and Health Characteristics by Coverage Status Transitions, 2006 (N=9573)

	Total (N=9573)	Current Part D coverage with Rx coverage in 2003 as follows:				Stable Rx coverage source & status (2003–2006)	
		Total Part D (N=5171)	None (2003) (N=1619)	Medicaid (2003) (N=1125)	Employer (2003) (N=649)	Employer (N=1882)	None (N=476)
Age							
Mean (SD)	77.0 (6.3)	76.9 (6.3)	**77.3 (6.3)***	77.4 (6.7)	75.5 (5.5)***	76.1 (6.0)***	**78.4 (6.7)*****
Gender							
Female	59.1	**64.0*****	**69.5*****	**71.4*****	49.6***	53.8***	61.5
Race							
White	89.7	87.1***	91.0	55.6***	89.5	**92.6*****	91.1
AA	4.5	**6.1*****	4.4	**19.6*****	4.8	2.9***	2.7
Hispanic	3.0	**3.8*****	3.0	**15.2*****	1.0**	2.2*	2.0
Asian	1.7	1.9	0.4***	**6.7*****	**4.3*****	1.3	2.8
Other	1.1	1.1	1.2	**2.9*****	0.4	1.0	1.4
Poverty status							
≤100%	10.4	**15.4*****	**15.1*****	**64.4*****	3.9***	1.7***	**15.4*****
101%–150%	18.0	**22.4*****	**25.2*****	**24.2*****	10.0***	6.7***	**30.0*****
151%–200%	10.9	**11.8****	**12.4***	5.5***	10.7	8.6***	10.6
>200%	60.7	50.4***	47.3***	5.9***	**75.4*****	**83.0*****	44.0***
Education							
Less than HS	20.2	**24.3*****	**28.5*****	**58.6*****	16.0**	10.9***	22.7
HS Graduate	37.2	36.2	36.1	26.8***	36.6	36.8	39.8
Some college	20.7	20.1	18.9	7.4***	23.1	21.8	21.6
College grad+	21.9	19.4***	16.5***	7.2***	24.3	**30.5*****	15.9**
Chronic conditions							
None	13.5	11.2***	10.6***	9.2**	7.5***	10.9***	**35.0*****
1 or 2	45.6	46.5	**47.9***	37.6***	**50.4****	**49.4*****	45.5
3 or more	40.9	**42.3****	41.5	**53.2*****	42.1	39.7	19.5***
Number of prescription medicines							
None	9.9	9.1*	9.8	7.6	7.5*	8.2**	**32.2*****
1–2	19.5	19.0	20.1	16.1	19.5	19.1	**27.3*****
3–4	24.7	**26.2*****	**29.0*****	18.2***	25.8	24.2	19.6*
5–6	20.4	19.8	20.3	22.0	17.4*	**23.7*****	15.2**
7+	25.5	25.9	20.8***	**36.1*****	**29.8****	24.8	5.7***
Mean (SD)	4.6 (3.2)	5.0 (3.2)	4.2 (2.9)***	**5.5 (3.6)*****	**4.9 (3.3)***	4.7 (3.1)	2.5 (2.6)***

$^{*}p\leq0.05$ $^{**}p\leq0.01$ $^{***}p\leq0.001$

Bold *type indicates significantly* ***higher*** *than the total population; Underline type indicates significantly lower than the total population*

Table 3. Prescription Medicine Use and Out-of-Pocket Spending by Coverage Source, 2003–2006

	Utilization				Out-of-pocket spending							
	Number of Rx medicines (mean)				$100 or more per month				$300 or more per month			
	2003	2006	Unadj Chg	Adj Chg[a]	2003	2006	Unadj Chg	Adj OR[b]	2003	2006	Unadj Chg	Adj OR[b]
Total (n = 9573)	4.0	4.6	0.6***	0.8	28.3	28.9	0.6	0.9	6.0	7.7	1.7**	1.2
Current Part D (2006), previous Rx coverage was:												
None (n=1619)	3.3	4.2	0.9***	1.0***	46.1	29.2	−16.9***	0.3***	10.5	11.0	0.5	0.9
Medicaid (n=1125)	5.6	5.5	−0.1	−0.3	14.8	9.2	−5.6*	0.5*	7.9	1.7	−6.2**	0.2**
HMO (n=712)	3.9	4.2	0.3	0.3	28.8	24.1	−4.7	0.7	4.1	5.7	1.6	1.3
Medigap/ Private (n=827)	3.9	4.6	0.7***	0.7***	46.0	36.3	−9.7**	0.9	9.6	11.1	1.5	0.8
Employer (n=649)	4.7	4.9	0.2	0.1	18.1	31.1	13.0***	2.2***	4.3	6.8	2.5	1.6
Other Rx coverage 2003–2006												
Employer (n=1882)	4.3	4.7	0.4***	0.3***	14.6	24.5	9.9***	1.9***	2.5	4.8	2.3*	2.1*
VA (n=150)	5.5	5.3	−0.2	−0.2	15.5	35.8	20.3**	4.7**	5.5	6.3	0.8	1.1
No Rx coverage, 2003–2006												
None (n=476)	2.2	2.5	0.3	0.4**	31.2	32.0	0.8	1.0	7.6	9.8	2.2	1.0

*p≤0.05 **p≤0.01 ***p≤0.001

[a]*Results are adjusted for the following: Age in 2003, race, poverty status in 2003, change in poverty status, acquisition of specific chronic condition, and change in Rx coverage*

[b]*Adjusted odds ratio. Results are adjusted for the following: Age in 2003, race, poverty status in 2003, change in poverty status, number of Rx medicines in 2003, change in number of Rx medicines, acquisition of specific chronic condition, change in Rx coverage*

income subsidy (LIS) program (15.5%). Most (58.7%) reported being unaware of the program. By contrast, higher income beneficiaries with chronic illness who lack coverage (n=114) show significantly lower rates of cost-related medication non-adherence (p<0.001), and little evidence of cost-related underuse of physician or hospital care.

DISCUSSION

Three major sets of study findings are important to evaluating early accomplishments of Medicare Part D and considering its future direction. First, in its initial year, the Part D program appears to have met many of its goals. Second, those with employer-sponsored coverage in 2003 experienced significantly increased out-of-pocket costs, irrespective of whether they continued in employer-sponsored (non-Part D) plans or enrolled in Part D. Third, those who remained without prescription coverage after Part D implementation comprise two broad groups: those who appear to have made a considered choice not to purchase prescription coverage based on their favorable health status and low use of care, and those who are less well-off and appear to be struggling in the absence of prescription coverage.

Table 4. Efforts to Contain Prescription Spending by Coverage Source, 2003–2006

	Cost-related non-adherence (%)				Didn't fill Rx 1+ times (%)				Skipping doses of Rx to make Rx last longer (%)				Taking smaller doses of Rx to make Rx last longer (%)			
	2003	2006	Unadj Chg	Adj OR[a]	2003	2006	Unadj Chg	Adj OR[a]	2003	2006	Unadj Chg	Adj OR[a]	2003	2006	Unadj Chg	Adj OR[a]
Total (n=9573)	26.0	19.4	−6.6***	0.6***	17.9	11.0	−6.9***	0.5***	15.2	11.1	−4.1***	0.7***	12.0	9.9	−2.1**	0.8**
Current Part D (2006), Previous Rx Coverage was:																
None (n=1619)	39.8	23.2	−16.6***	0.4***	29.2	13.7	−15.5***	0.3***	25.4	13.3	−12.1***	0.4***	18.3	12.1	−6.2***	0.6***
Medicaid (n=1125)	29.3	25.5	−3.8	0.9	14.4	13.5	−0.9	0.9	20.8	13.0	−7.8*	0.6*	14.4	12.6	−1.8	0.8
HMO (n=712)	41.0	27.5	−13.5***	0.4***	29.9	17.5	−12.4***	0.4***	22.0	12.9	−9.1**	0.4**	15.6	12.6	−3.0	0.7
Medigap/ Private (n=827)	31.3	22.8	−8.5**	0.6**	22.3	14.0	−8.3**	0.5**	18.3	13.2	−5.1*	0.6*	13.4	10.9	−2.5	0.7
Employer (n=649)	17.4	25.0	7.6**	1.7**	12.3	14.7	2.4	1.2	10.0	15.2	5.2*	1.7*	9.7	12.1	2.4	1.3
Other Rx coverage 2003–2006																
Employer (n=1882)	13.1	9.8	−3.3*	0.7*	6.9	5.4	−1.5	0.8	6.9	5.4	−1.5	0.8	5.8	5.0	−0.8	0.8
VA (n=150)	22.5	11.8	−10.7	0.5	16.9	7.0	−9.9	0.4	8.7	8.6	−0.1	1.1	14.5	4.8	−9.7	0.3
No Rx coverage, 2003–2006																
None (n=476)	30.2	24.4	−5.8	0.7	22.8	18.7	−4.1	0.7	18.9	12.0	−6.9	0.5	12.2	11.6	−0.6	0.9

*p≤0.05 **p≤0.01 ***p≤0.001

[a]*Adjusted odds ratio. Results are adjusted for the following: Age in 2003, race, poverty status in 2003, change in poverty status, number of Rx medicines in 2003, change in number of Rx medicines, acquisition of specific chronic condition, change in Rx coverage*

Table 5. Use of Medical Care and Prescriptions Overall, Among Part D Enrollees, and Among Those Persistently Without Prescription Coverage

Reported System Use (2006)	Total (n=9573)	Acquired Part D (Previous No Coverage) (n=1619)	No Rx Coverage 2003–2006 (N=476)				
			Total (n=476)	Low Income (<200% FPL) (n=276)		Higher Income (>200% FPL) (n=200)	
				No conditions[a] (n=106)	1+ conditions[a] (n=170)	No conditions[a] (n=86)	1+ conditions[a] (n=114)
Engagement with System							
Has regular personal doctor	94.3	95.7*	81.0***	55.3***	86.9***	67.8***	95.9
Number of different docs							
None	6.1	7.0	19.5***	45.8***	10.0*	17.9***	18.3***
1	18.9	20.3	24.8**	20.2	24.8	31.4**	23.0
2–3	50.2	51.2	44.1*	25.7***	49.7	45.6	46.4
4+	24.7	21.5**	11.6***	8.3**	15.5**	5.1***	12.3**
Number of chronic conditions (Avg)	2.3	2.4	1.4	0.0	2.2	0.0	2.0
Total Rx medicines (Avg)	4.6	4.2***	2.5***	0.4***	3.9**	0.5***	3.1***
None (%)	9.7	9.6	29.8***	81.6***	1.2***	84.1***	4.1
Out-of-pocket spending > $100/month	29.8	29.2	32.0	3.4**	38.0*	12.8	32.4
Cost-related non-use of system							
Went w/o care from a doctor due to cost	9.1	10.7*	17.8***	27.4***	22.1***	7.7	12.7
Avoided hospital due to cost	4.8	5.0	6.8	8.7	9.9**	2.2	4.2
Cost-related non-adherence	19.4	23.2***	24.4*	21.1	31.8***	17.2	15.6
Knowledge and attitudes about low-income subsidy							
Applied for LIS	4.5	9.1***	6.7*	0.8	15.5***	0.6	1.1
Did not apply because							
• Did not know about it	49.4	49.2	53.6	58.1	58.7*	53.9*	42.5
• Do not need help with Rx	20.6	11.3***	13.6***	16.5	1.7***	19.4	26.2
• Did not know how	0.6	0.7	1.3	0.5	2.9***	0.0	0.4
• Too much trouble	0.7	0.6	2.2***	0.0	2.4**	0.4	4.5
• Thought would not qualify	16.4	26.0***	16.5	16.1	12.7	21.7*	19.1**
• Other reason[b]	7.8	3.1***	6.1	8.0	6.1	4.0	6.2

$^{*}p \le 0.05$ $^{**}p \le 0.01$ $^{***}p \le 0.001$

Significance testing compares each column to total population

[a]*Subgroups are defined using respondents' 2006 status of number of chronic conditions and poverty level.*

[b]*Respondents either chose the "Other" option for not applying (n=452) or did not specify a reason for not applying (n=264).*

Early Program Achievements. By late 2006, the Part D program had accomplished its primary goal of reducing the percentage of Medicare beneficiaries without prescription coverage or with meager benefits. The majority of those who acquired coverage did so by joining a Part D plan—and among this group, most opted for stand-alone drug plans (PDPs) over Medicare Advantage plans with drug coverage. The value of Part D coverage was particularly apparent among two groups: those who previously lacked prescription coverage and those who previously had drug coverage through a Medigap policy. Medigap and other similar private plans are known to have had a limited scope of benefits, associated with high out-of-pocket costs and financial strain among enrollees[1,3]. For those previously without coverage or with meager benefits, the significantly increased use of prescription medications, coupled with lower spending and significantly reduced cost-related non-adherence evidence the relief found under Part D. Overall experiences of beneficiaries dually enrolled in Medicare and Medicaid accord with those reported by Shrank et al., whose claims-based analyses found substantial stability in prescription utilization, coupled with reduced out-of-pocket spending as this group transitioned to Part D[8].

Changes in Employer-Sponsored Coverage. The 2003 to 2006 period saw increased cost-sharing among those who began the study with employer-based prescription coverage, regardless of whether they retained that coverage or transitioned to Part D. The findings portray seniors' experiences in the face of the eroding retiree health benefits recently reported by employers[18]. The findings also signal a form of adverse selection from employer-based coverage into Part D plans—showing a higher socioeconomic and disease burden among those transitioning from employer coverage to Part D plans compared with those retaining employer-based coverage. The significantly higher rate of cost-related non-adherence among the group that transitioned from employer coverage to Part D underscores the difficulties posed by increased medication cost-sharing for this subgroup. Together, these findings highlight the substantial interplay between Part D and employer-sponsored coverage, which has important bearing on future program scope and costs.

Seniors Who Continue To Lack Prescription Coverage. Finally, our findings evidence two relatively distinct groups of seniors who remained without prescription coverage throughout the 3-year study period. The first are seniors who appear to have made a considered decision to remain without prescription coverage. Of these, some are low-income seniors who report no chronic conditions, and who appear to be largely detached from the health care system. Others are higher income seniors

with or without chronic conditions, but evidencing little financial burden related to their health care needs.

By contrast, the second group of seniors who persistently lacked drug coverage are both low income and chronically ill, and show evidence of considerable financial strain related to health care overall and prescription medications, specifically. The majority of these seniors was unaware of LIS assistance or believed they were ineligible, underscoring the value of aggressive, targeted and continuing outreach for LIS enrollment.

Limitations. The study has several relevant limitations. First, while the longitudinal design affords a unique opportunity to evaluate changes in prescription use and spending associated with changes in coverage, those who are sickest and most disengaged from the system are more likely to be unrepresented due to non-response or study attrition. In addition, the study design excluded institutionalized beneficiaries and those younger than age 65. The high poverty and disease burden of both groups press for evaluating their experiences over time. Next, the study relies entirely on self-reported information concerning prescription coverage status, sources, use and spending. The longitudinal design, wherein each individual serves as his own control, helps mitigate any systematic biases in self-reported information. However, claims data, if available, would be advantageous. Finally, without information about the specific prescription medications used over time, the study has limited ability to comment on the observed changes from a clinical perspective. The study findings complement several recent studies that employ pharmacy claims data that, while applied to more limited sample frames than this study, find comparable utilization and spending trends[7–9], and afford clinically relevant information about drug-specific utilization changes[8,9].

CONCLUSIONS

Evidence of Medicare beneficiaries' early experiences with Part D is largely favorable. Since 2003, the share of seniors who lacked prescription coverage declined substantially, and those enrolled in Part D plans who previously lacked coverage or had meager benefits now appear better able to afford their prescription medications—with significantly higher use rates, lower out-of-pocket costs and reduced cost-related non-adherence. However, the findings evidence an erosion of employer-sponsored drug coverage, documenting for the first time this group's changes in out-of-pocket spending over the period surrounding Part D implementation. This finding, coupled with evidence of unfavorable selection of sicker, more socioeconomically disadvantaged beneficiaries from employer-sponsored plans into Part D has important implications for the program's future, and merits continued monitoring. Finally, nearly one in ten non-institutionalized beneficiaries lacked prescription coverage in 2006, and it appears that about one-third of these are low-income, chronically ill seniors who evidence considerable difficulty affording their medicines. Aggressive, targeted outreach to this group for LIS enrollment remains important. Ongoing monitoring of the program overall, and the experiences of its enrollees, will remain important with the continued evolution of Part D benefits, and of the plans and markets through which they are delivered.

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Conflict of interest: *Dr. Safran and Ms. Li are employed by Blue Cross Blue Shield of Massachusetts (BCBSMA). BCBSMA is a not-for-profit health care company whose products include a variety of plans available to Medicare beneficiaries.*

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