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The Medicare Drug Benefit (Part D) and Treatment of Heart Failure in Older Adults

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Abstract

Background—Adherence to pharmacotherapy for heart failure is poor among older adults due, in part, to high prescription drug costs. We examined the impact of improvements in drug coverage under Medicare Part D on utilization of, and adherence to, medications for heart failure in older adults.

Methods—We used a quasi-experimental approach to analyze pharmacy claims for 6,950 individuals age ≥ 65 years with heart failure enrolled in a Medicare managed care organization two years before and after Part D's implementation. We compared prescription fill patterns among individuals who moved from limited (quarterly benefits caps of \$150 or \$350) or no drug coverage to Part D in 2006 to those who had generous employer-sponsored coverage throughout the study period.

Results—Individuals who previously lacked drug coverage filled approximately 6 more heart failure prescriptions annually after Part D (Adjusted Ratio of Prescription Counts = 1.36, 95% Confidence Interval=CI=1.29-1.44; $p < 0.0001$ relative to the comparison group). Those previously

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lacking drug coverage were more likely to fill prescriptions for an angiotensin converting enzyme inhibitor/angiotensin II receptor blocker plus a beta blocker after Part D (adjusted ratio of odds ratios=AROR=1.73; 95% CI=1.42-2.10; $p<0.0001$), and more likely to be adherent to such pharmacotherapy (AROR=2.95; 95% CI=1.85-4.69; $p<0.0001$) relative to the comparison group.

Conclusions—Medicare Part D was associated with improved access to medications and adherence to pharmacotherapy in older adults with heart failure.

INTRODUCTION

Heart failure is highly prevalent in adults age 65 and older.¹ It is the most common reason for hospitalization among Medicare beneficiaries¹ and nearly one-third of those hospitalized die within one year.¹ Pharmacotherapy is the mainstay of heart failure management in older adults.² Studies have shown that angiotensin-converting enzyme inhibitors (ACEI),³ angiotensin II receptor blockers (ARB),⁴ and beta blockers⁵ decrease hospital admissions and mortality in elderly patients. Indeed, current guidelines recommend the combination of an ACEI (or ARB) and a beta blocker for older adults with heart failure.^{2, 6} Programs aimed at improving adherence to these guidelines have reduced hospitalization and mortality.⁷ Despite this evidence of effectiveness, these pharmacotherapy options are under-utilized.⁸

One possible cause of underuse may be the financial burden associated with long-term use of these medications.^{9, 10} The Medicare drug benefit (Part D), which was designed to reduce the out-of-pocket costs of prescription drugs and improve medication adherence, may mitigate cost-related underuse of medications to treat heart failure. Part D has cut in half the number of older adults who lack drug coverage, and is associated with increases in prescription drug use,¹¹ particularly among those who previously lacked drug coverage.¹² However, the impact of the Medicare drug benefit on treatment of heart failure has not been examined.

The objective of the current study is to examine the impact of improvements in prescription drug coverage on utilization of and adherence to medications used to treat heart failure in older adults among those with varying levels of prescription drug coverage.

METHODS

Study Design, Sample and Source of Data

This study was funded by the National Institutes of Health. We obtained pharmacy and medical claims, and enrollment data for patients with heart failure from a large health insurer in Pennsylvania for 2003-2007. Using Part D's January 2006 implementation as a natural experiment, we compared medication utilization among four groups with different pharmacy benefits in 2004-2005. Two groups had quarterly pharmacy benefit limits of \$150 or \$350, depending solely on their county of residence (referred to hereafter as the "\$150 cap" and "\$350 cap" groups). A third group had no drug coverage ("No coverage"). The fourth group was enrolled in either employer or union group plans that offered supplemental prescription drug coverage. This latter "No cap" group did not have any quarterly caps on their pharmacy benefits. All three groups with drug coverage paid tiered copayments (\$10 generic/\$20 brand name for the No Cap group and \$12 generic/\$20 brand for the \$150 and \$350 cap groups). Other medical benefits (e.g., outpatient visit copayments) were similar across the four groups. Because the No Cap group's coverage depended on decisions by employers to offer supplementary coverage, and few people decline this coverage because it is generous, we believe selection bias based on health status into the No Cap plan is minimal.

In January 2006, the No coverage, \$150 cap and \$350 cap groups obtained Part D drug benefits through the same insurance company. Like most Part D plans, the Medicare Advantage Prescription Drug (MA-PD) plans in this study did not include a deductible. Members faced copayments (e.g., \$8/\$20 for generic/brand-name drugs) until their total drug spending reached the coverage gap, or donut hole (\$2,250 in 2006). In the donut hole, the MA-PD plans either covered nothing or generic drugs only with an \$8/\$10 copayment, depending on the option chosen by the member. After members' annual total drug spending reached the catastrophic coverage limit (\$5,100 in 2006), they paid the greater of five percent coinsurance or a copayment (\$2 to \$5). Beneficiaries in the No cap group maintained the same generous drug coverage they had in 2004-05 in 2006-07; they faced neither a donut hole nor a coverage limit.

For our analyses, the intervention groups were the No coverage, \$150 cap and \$350 cap groups who enrolled in Part D drug plans in 2006-2007. The comparison group was the No cap group with stable, generous pharmacy benefits throughout the study period. We estimated and compared changes in medication use in the four coverage level groups before and after Part D.

Study Population

The study population included beneficiaries age 65 and older, who were continuously enrolled with the insurance company and alive from 2003 to 2007 with a diagnosis of heart failure (*International Classification of Diseases* (ICD-9) version 9 codes 428.x, 429.3, 425.x, 402.01, 402.11, 402.91) on an inpatient or outpatient claim in 2003. These diagnosis codes have been used to identify heart failure in administrative data for case mix adjustment.¹³ We also required that individuals fill a prescription for a heart failure medication in one of the insurer's network pharmacies in 2003. The medications of interest include ACEIs, ARBs, beta blockers, digoxin, aldosterone-inhibiting diuretics (e.g., spironolactone), other diuretics, and vasodilators (e.g., hydralazine). The overall sample size was 6,950.

Outcome measures

We constructed person-year level measures of medication use and adherence from pharmacy claims. We measured total annual counts of prescriptions filled for heart failure and other medications, standardized by a 30-days supply (i.e., prescriptions with 90-days supplied counted as three prescriptions). We created several dichotomous variables for use of heart failure drugs. Three medication categories – ACEIs, ARBs and beta blockers -- are recommended in clinical guidelines for heart failure in older adults.^{2,6} Two others -- digoxin and aldosterone-inhibiting diuretics -- are also included in general heart failure guidelines but are considered second line choices for older adults as they frequently lead to adverse drug reactions, especially those with reduced renal function.^{2,6}

We constructed dichotomous measures of good refill adherence based on medication possession ratios (MPR) (number of days covered between the first and last prescription during the period (pre or post-Part D)).^{14, 15} This measure captures non-adherence due to skipping or reducing doses but not that due to discontinuation of a medication due a physician's recommendation. We constructed pharmacologic class-specific MPRs for individuals filling at least one prescription for a medication in that class in 2003. Good adherence was defined as having 80% of days covered with a prescription between the first and last prescription during the study period, a threshold commonly used in adherence studies.¹⁶ For example, for individuals filling a prescription for beta blockers in 2003, we determined whether they had 80% of days covered with a beta blocker pre- and post-Part D.

Independent Variables

Our primary independent variables were generosity of pharmacy benefits in 2005 (No coverage, \$150 cap, \$350 cap, No cap), and time with respect to the policy change (pre-/post-Part D). We used time $\times$ pharmacy benefit level interaction terms to assess whether the policy's impact varied by the level of pre-Part D drug benefits.

Covariates

Socio-demographic covariates included age, sex, and census block group-level data on race (percent of residents who are black), income (percent of residents with incomes below poverty-level), and education (percent of residents with some college education). We included several variables to control for differences in health status. First, we included a time-varying indicator of prospective risk score calculated at the end of each year. Risk scores are calculated using Risk Grouper software from DxCG which uses a series of proprietary algorithms based on the presence of dozens of ICD-9 diagnosis and/or Healthcare Common Procedure Coding System codes. The scores are similar to the Centers for Medicare and Medicaid Services-Hierarchical Condition Categories (CMS-HCC) weights used to adjust MA-PD payments.¹⁷ A higher prospective score indicates a likelihood of higher spending in the following year. Second, we included dummy variables for the following mental health and medical comorbidities (depression, ICD-9 codes 296.2, 296.3, 300.4 or 311; diabetes, ICD-9 code 250; hypertension, ICD-9 codes 401-404; ischemic heart disease 410-414). Third, we included a measure of the number of outpatient doctor visits each year.

Statistical analysis

SAS® version 9.1 (SAS Institute, Inc., Cary, North Carolina) was used for all statistical analyses. Appropriate descriptive statistics (frequencies, percentages, means, standard deviations) were used to summarize participant characteristics. Pearson chi-square and analysis of variance (ANOVA) were used to compare characteristics among the groups based on pre-Part D pharmacy benefit generosity. For the analysis of prescription counts, we fit a series of generalized estimating equations (GEE) models¹⁸ with each count outcome (any prescription, any heart failure medication prescription) as the response variable, using a negative binomial distribution for the response variable and a log link function. The main categorical independent variables included time period (pre-/post-Part D), level of generosity in pre-Part D pharmacy benefit (no coverage/\$150 cap/\$350 cap/No cap) and the time period $\times$ generosity level interaction. We used an exchangeable correlation structure to account for multiple data points from the same subjects over time and the resulting stochastic non-independence of observations. To avoid the problem of over-dispersion, we use a negative binomial (as opposed to a Poisson) distribution for the response variable where mean and variance can be modeled independently. For the dichotomous use and adherence outcomes, we employed a GEE model with a similar structure, but with a binomial distribution and logit link function. We constructed contrasts to obtain post- vs. pre-Part D odds ratios separately for each level of pre-Part D pharmacy benefit; and to obtain ratios of such odds ratios with the No cap group as the reference category.

We conducted analyses using alternative cohort definitions and specification of outcome. First, we modeled the post-Part D years separately to allow for different effects due to improved familiarity with the program over time. The results were nearly identical for 2006 and 2007; thus we present a pooled post-Part D effect. Second, we constructed an alternative cohort to reduce attrition in the elderly with high mortality risk by requiring 3-year (instead of 5-year) continuous enrollment. The results were qualitatively similar so we present only the results from the 5-year cohort.

This study was approved by the University of Pittsburgh Institutional Review Board. The investigators were supported by grants from the National Institutes of Health and the Veterans Administration Health Services Research and Development Service. The authors are solely responsible for the design and conduct of this study, all study analyses, the drafting and editing of the paper and its final contents.

RESULTS

The groups who previously had no or limited coverage were slightly older (1-2 years) and more likely to be female than the No Cap group that had consistent drug coverage throughout ($p<0.05$) (Table I). The No coverage and \$150 cap groups were slightly more likely to live in areas with higher poverty levels ($p<0.05$). There were some differences in the prevalence of comorbid mental health and medical conditions; compared to the No Cap group, the No coverage group was more likely to have depression and less likely to have diabetes and the \$350 cap group was less likely to have diabetes and ischemic heart disease ($p<0.05$). However, there were no statistically significant differences in prospective risk score, indicating comparable health status and likelihood of health services use across pharmacy benefit levels.

Table II shows that Medicare Part D was associated with an increase in prescriptions filled for heart failure and other drugs. The No Coverage group that transitioned to Part D increased the number of prescriptions filled for heart failure from 13.0 to 18.6 (unadjusted). This change was significant after adjusting for the slight upward trend in the No Cap group (adjusted ratio of counts relative to No cap group = 1.36 (95% CI 1.29-1.44, $p<0.0001$). Smaller but statistically significant increases ($p<0.001$) were seen in the other two groups that transitioned to Part D. We report a similar pattern in the magnitude of increases in number of prescription fills overall after Part D by coverage group.

Table III shows Part D's impact on the likelihood of filling at least one prescription in the four classes of interest. Among older adults who went from No coverage to Part D, likelihood of use of ACEIs or ARBs, beta blockers and their combination increased. The proportion of the No coverage filling a prescription for an ACEI/ARB plus a beta blocker increased from 21% to 32%; adjusted ratio of the Odds Ratios (OR) adjusting for trends in the comparison group was 1.73, 95% CI 1.42-2.10 after Part D. With one exception (i.e., the \$350 cap group's ACEI/ARB use), smaller but statistically significant increases were also seen among those who previously had capped benefits compared to the comparison group for these three medication classes/combinations. Part D was not associated with statistically significant changes in use of aldosterone-inhibitor diuretics in any of the intervention groups relative to the No Cap group. All three groups with no or limited drug coverage increased their use of digoxin over the study period but these increases were generally smaller than that of the No cap group (Ratios of Odds Ratios <1).

Table IV displays the impact of Part D on good refill adherence (80% of days covered with heart failure medications). Relative to the comparison group, the No Coverage group experienced significant increases ($p=0.01$ or less) in the likelihood of good adherence after Part D within each class and combination of classes with the exception of aldosterone-inhibiting diuretics ($p=0.85$). For example, the unadjusted proportion with 80% of days covered with an ACEI/ARB plus a beta blocker in the no coverage group increased from 67% to 78% after Part D (adjusted ratio of ORs = 2.95, 95% CI 1.85-4.69, $p<0.0001$). The groups who previously had capped benefits experienced small reductions in adherence to ACEI or ARB and no statistically significant change in beta blocker or combination ACEI/ARB plus beta blocker adherence.

DISCUSSION

This is the first study to demonstrate that Medicare Part D was associated with increased use of heart failure medications. These findings are consistent with a major goal of the policy which was to reduce financial barriers to medication access among the elderly. Previous studies have shown that, before Part D, rates of prescribing of and adherence to pharmacotherapy regimens for heart failure were suboptimal.^{19, 20} For example, only 43.6% of incident heart failure patients in the Cardiovascular Health Study were taking a beta blocker.²⁰ We report a significant increase in beta blocker use among those without coverage in 2004-05 who obtained Part D benefits, from 45% to 59%. Evidence linking beta blocker use with reduced 1-year mortality rates in older adults²¹ suggests that this increased use may reduce mortality among Medicare beneficiaries with heart failure.

Our study also showed that medication refill adherence for heart failure improved with Part D. A previous study by Madden et al²⁴ using national data from the Medicare Current Beneficiary Survey showed that Part D reduced the rate of self-reported cost-related non-adherence from 15% to 11%, however, the analysis did not stratify by level of drug coverage or clinical condition. We found that the proportion of older adults with heart failure who lacked drug coverage prior to Part D who had good adherence with an ACEI or ARB and beta blocker increased from 67% in 2004-2005 to 78% in 2006-2007. Given the impact of improved medication adherence in older adults with heart failure on health care use and costs⁷ this improvement could lead to reductions in health care costs overall for this population. We note that adherence in the comparison group fell significantly over the study period. This finding is consistent with evidence of poor long-term adherence to medications used to treat or prevent cardiovascular disease.²⁵ In spite of the reduction in adherence during the study period, adherence rates in the No Cap group tended to be higher for this group compared to those in Part D. This is likely due to the gap in coverage or “donut hole” for those with Part D benefits and its impact on adherence.²⁶

It is important to note that expansions in drug coverage did not appear to increase the use of second line agents (e.g., digoxin or aldosterone-inhibiting diuretics) for heart failure in older adults. This may reflect prescribers’ awareness of the high rate of serious adverse drug reactions with these medications when used in older adults with heart failure.^{22, 23} It is also possible that we were underpowered to detect statistically significant changes in the use of these agents.

There are some potential limitations to our study. Using ICD-9 codes to identify heart failure may result in some misclassification, although restricting the sample to those filling prescriptions for medications indicated for heart failure has high specificity.²⁷ We could not identify those with diastolic heart failure for whom ACE/ARB plus beta blockers may not be indicated. We do not, however, expect misclassification to differ across pharmacy benefit groups; thus our estimates of Part D’s effect should be unaffected. Some persons without drug benefits may have filled prescriptions at non-network pharmacies before Part D which may result in overestimation of the policy’s effect. However, patients had a strong financial incentive to present their insurance card at network pharmacies; they pay 15% less even when no payment is made by the insurer. We also limited our analyses to those filling at least one prescription in a network pharmacy to minimize censoring. Prescription fills may overestimate actual medication use. However, prescription fills provide similar estimates of adherence to self-report and Medication Event Monitor Systems (MEMS®).²⁸ Lastly, this study of community-dwelling elders living in Pennsylvania enrolled with a single insurer may not be nationally representative. However, our study population spans the range of pharmacy benefits in existence at Part D’s implementation.

In summary, Medicare Part D was associated with improved access to medications and adherence to pharmacotherapy in older adults with heart failure. Future studies should examine the impact of Medicare Part D on the quality of prescribing and related health outcomes.

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Table I
Characteristics of Study Sample in 2005 [Mean±standard deviation or percent (%)]

	Pharmacy Benefit Group			
	No coverage N=534	\$150 cap N=163	\$350 cap N=4,000	No Cap N=1,803
Age	79.3 [*] ±5.9	78.2 [*] ±6.0	77.8 [*] ±6.1	76.9±5.9
Females (%)	66.1 [*]	61.8 [*]	55.0 [*]	46.8
Blacks in census block (%)	6.1±14.7	2.7 [*] ±6.8	5.6±13.8	5.9±14.4
Below the federal poverty level in census block (%)	5.6 [*] ±4.4	5.6 [*] ±3.7	4.6±3.8	4.7±4.0
At least some college education in census block (%)	40.2 [*] ±12.6	35.6 [*] ±12.0	45.1±14.5	45.3±14.6
Prospective risk score	1.9±1.2	1.8±1.1	1.8±1.2	1.9±1.3
Annual Visits to Physicians' Office	16.0 [*] ±10.6	17.3±11.6	16.9 [*] ±11.6	18.2±12.0
Co-morbidity (%)				
Depression	13.9 [*]	9.6	10.0	9.9
Diabetes	39.9 [*]	41.9	40.4 [*]	45.6
Hypertension	85.0	85.3	86.2	87.4
Ischemic Heart Disease	67.6	66.1	66.3 [*]	69.4

Notes:

* differences are statistically significant at p<0.05 level compared to no cap group

[†] Risk scores calculated at the end of 2005 for each group using Risk Grouper software from DxCG. A higher prospective score indicates a likelihood of higher spending in the following year.

Table II
Impact of Medicare Part D on Total and Heart Failure Prescriptions Filled Annually

Unadjusted Descriptive Statistics		Adjusted Impact of Part D			Comparison of Adjusted Impact of Part D			
			Adjusted Ratio of Counts*	95% Confidence Interval	p-Value	Ratio of Adjusted Ratio of Counts, Relative to No Cap*	95% Confidence Interval	p-Value
	Pre-Part D Mean±SD	Post-Part D Mean±SD						
Heart failure prescriptions filled annually [†]								
No coverage	13.0±11.1	18.6±13.1	1.40	(1.33-1.47)	<0.0001	1.36	(1.29-1.44)	<0.0001
\$150 cap	17.9±11.6	20.1±20.1	1.11	(1.07-1.15)	<0.0001	1.08	(1.04-1.12)	<0.0001
\$350 cap	18.3±11.4	19.8±12.8	1.07	(1.06-1.09)	<0.0001	1.04	(1.02-1.07)	0.0001
No cap	20.6±12.0	21.4±13.1	1.03	(1.01-1.04)	0.006	reference		
Total prescriptions filled annually								
No coverage	42.8±32.2	58.7±37.1	1.34	(1.29-1.39)	<0.0001	1.32	(1.27-1.38)	<0.0001
\$150 cap	52.7±28.7	58.7±31.0	1.09	(1.06-1.12)	<0.0001	1.07	(1.05-1.10)	<0.0001
\$350 cap	53.8±26.7	58.5±30.2	1.07	(1.06-1.08)	<0.0001	1.06	(1.04-1.07)	<0.0001
No cap	70.2±34.1	72.4±36.0	1.01	1.00-1.03	0.04	reference		

* Adjusted for age, sex, prospective risk score, census block group-level data on race, federal poverty level and education using GEE negative binomial model. Pre-Part D time period is January 1, 2004-December 31, 2005. Post-Part D time period is January 1, 2006-December 31, 2007

[†] CHF prescriptions include Angiotensin Converting Enzyme Inhibitors (ACEIs), Angiotensin II Receptor Antagonists (ARBs), Beta Blockers, digoxin, aldosterone-inhibitor diuretics, other diuretics and vasodilators.

Table III
Impact of Medicare Part D on Likelihood of Filling a Prescription for Drugs in Major Therapeutic Classes for Heart Failure

	Unadjusted Descriptive Statistics		Adjusted Impact of Part D			Comparison of Adjusted Impact of Part D		
	Pre-Part D (%)	Post-Part D (%)	Adjusted Odds Ratio *	95% Confidence Interval	p-Value	Ratio of Odds Ratios *	95% Confidence Interval	p-Value
ACEI or ARB [†]								
No coverage	51	55	1.16	(1.02-1.32)	0.03	1.28	(1.10-1.48)	0.001
\$150 cap	53	55	1.07	(0.95-1.20)	0.26	1.18	(1.03-1.36)	0.02
\$350 cap	64	63	0.94	(0.90-0.99)	0.01	1.04	(0.96-1.13)	0.30
No cap	69	67	0.90	(0.84-0.97)	0.004		reference	
Beta Blockers								
No coverage	45	59	1.81	(1.55-2.11)	<0.0001	1.73	(1.46-2.05)	<0.0001
\$150 cap	55	62	1.30	(1.15-1.47)	<0.0001	1.24	(1.08-1.43)	0.003
\$350 cap	58	63	1.20	(1.15-1.26)	<0.0001	1.15	(1.06-1.25)	0.0006
No cap	65	66	1.05	(0.98-1.12)	0.19		reference	
ACEI or ARB Plus Beta Blocker [†]								
No coverage	21	32	1.77	(1.47-2.13)	<0.0001	1.73	(1.42-2.10)	<0.0001
\$150 cap	30	36	1.26	(1.11-1.44)	0.0005	1.23	(1.06-1.43)	0.006
\$350 cap	36	40	1.14	(1.09-1.19)	<0.0001	1.11	(1.02-1.21)	0.01
No cap	44	45	1.02	(0.96-1.10)	0.50		reference	
Aldosterone-inhibitor diuretics								
No coverage	5	6	1.22	(0.87-1.70)	0.24	1.07	(0.75-1.53)	0.71
\$150 cap	8	8	1.00	(0.82-1.23)	0.98	0.88	(0.69-1.12)	0.30
\$350 cap	7	8	1.03	(0.94-1.12)	0.55	0.90	(0.77-1.05)	0.19
No cap	8	9	1.14	(1.00-1.29)	0.05		reference	
Digoxin								
No coverage	12	17	1.52	(1.28-1.80)	<0.0001	0.91	(0.74-1.12)	0.37
\$150 cap	14	18	1.32	(1.14-1.53)	0.0002	0.79	(0.66-0.95)	0.01
\$350 cap	13	17	1.40	(1.31-1.49)	<0.0001	0.84	(0.74-0.95)	0.01

	Unadjusted Descriptive Statistics		Adjusted Impact of Part D			Comparison of Adjusted Impact of Part D		
	Pre-Part D (%)	Post-Part D (%)	Adjusted Odds Ratio *	95% Confidence Interval	p-Value	Ratio of Odds Ratios *	95% Confidence Interval	p-Value
No cap	10	16	1.67	(1.49-1.86)	<0.0001		reference	

* Adjusted age, sex, prospective risk score, census block group-level data on race, federal poverty level and education using GEE binomial model. Pre-Part D time period is January 1, 2004-December 31, 2005. Post-Part D time period is January 1, 2006-December 31, 2007.

[†] ACEI=angiotensin converting enzyme inhibitors, ARB=angiotensin II receptor antagonists

Table IV
Impact of Medicare Part D on Likelihood of Having Good Refill Adherence (80% of days covered) for Drugs in Major Therapeutic Classes for Heart Failure

	Unadjusted Descriptive Statistics		Adjusted Impact of Part D			Comparison of Adjusted Impact of Part D		
	Pre-Part D (%)	Post-Part D (%)	Adjusted Odds Ratio *	95% Confidence Interval	p-Value	Ratio of Odds Ratios *	95% Confidence Interval	p-Value
ACEI or ARB †								
No coverage	54	62	1.39	(1.12-1.73)	0.003	1.91	(1.49-2.45)	<0.0001
\$150 cap	72	66	0.77	(0.61-0.97)	0.03	1.06	(0.82-1.37)	0.66
\$350 cap	69	65	0.86	(0.80-0.93)	<0.0001	1.18	(1.02-1.36)	0.02
No cap	75	68	0.73	(0.65-0.82)	<0.0001	reference		
Beta Blockers								
No coverage	52	57	1.24	(0.97-1.59)	0.09	1.55	(1.18-2.05)	0.0004
\$150 cap	67	64	0.91	(0.74-1.13)	0.41	1.15	(0.90-1.47)	0.27
\$350 cap	66	65	0.99	(0.91-1.08)	0.88	1.25	(1.07-1.45)	0.004
No cap	70	64	0.80	(0.70-0.90)	0.0004	reference		
ACEI or ARB Plus Beta Blocker †								
No coverage	67	78	1.95	(1.29-2.94)	0.002	2.95	(1.85-4.69)	<0.0001
\$150 cap	88	85	0.83	(0.53-1.30)	0.41	1.25	(0.76-2.06)	0.37
\$350 cap	85	83	0.92	(0.79-1.07)	0.29	1.39	(1.07-1.82)	0.01
No cap	89	82	0.66	(0.53-0.82)	0.0002	reference		
Aldosterone-inhibitor diuretics								
No coverage	54	42	0.65	(0.31-1.36)	0.25	1.08	(0.47-2.48)	0.85
\$150 cap	58	53	0.79	(0.43-1.46)	0.46	1.33	(0.66-2.69)	0.43
\$350 cap	61	49	0.71	(0.56-0.89)	0.003	1.18	(0.77-1.81)	0.44
No cap	56	41	0.60	(0.42-0.85)	0.005	reference		
Digoxin								
No coverage	56	67	1.41	(0.81-2.46)	0.22	1.86	(0.98-3.51)	0.06
\$150 cap	61	58	0.89	(0.58-1.38)	0.62	1.18	(0.69-2.01)	0.55

	Unadjusted Descriptive Statistics		Adjusted Impact of Part D			Comparison of Adjusted Impact of Part D		
	Pre-Part D (%)	Post-Part D (%)	Adjusted Odds Ratio *	95% Confidence Interval	p-Value	Ratio of Odds Ratios *	95% Confidence Interval	p-Value
\$350 cap	64	54	0.66	(0.56-0.79)	<0.0001	0.87	(0.61-1.25)	0.46
No cap	61	56	0.76	(0.56-1.04)	0.09	reference		

* Adjusted age, sex, prospective risk score, census block group-level data on race, federal poverty level and education using GEE binomial model. Pre-Part D time period is January 1, 2004-December 31, 2005. Post-Part D time period is January 1, 2006-December 31, 2007.