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**The Impact of Medicare Part D on Drug Utilization and Out-of-Pocket Spending:
Evidence from the Health and Retirement Study**

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Abstract: We use data from the 2004 and 2006 waves of the Health and Retirement Study to estimate the extent of adverse selection into Part D – did beneficiaries with high existing demand for prescription drugs disproportionately choose to enroll in the program? – and the impact of Part D on medication use and out-of-pocket spending. We compare changes in utilization and spending for those who gained new Part D coverage to changes for those who were consistently covered by employer-sponsored insurance or Medicare HMOs and those who had no drug coverage in 2004 or 2006. The results suggest that there was substantial selection into Part D: among Medicare beneficiaries with no drug coverage in 2004, those with high use and/or spending in 2004 were most likely to be enrolled in Part D in 2006. On average, the use of prescription drugs (number of prescriptions taken) did not change dramatically in response to Part D. Monthly out-of-pocket drug spending for previously uninsured, newly enrolled beneficiaries decreased, however. The median decrease was \$30, compared to median baseline spending of \$100 per month. In contrast, median out-of-pocket spending for those consistently covered by employer-sponsored insurance, Medicaid, Medicare HMOs or privately purchased prescription drug insurance did not change between 2004 and 2006. These results are consistent with respondents' subjective perception that Part D did not change their use of drugs but did reduce their out-of-pocket spending. Somewhat surprisingly, Medicare Part D does not seem to have reduced the extent of cost-related non-compliance among those who previously had no drug coverage. These preliminary findings suggest that the Part D program has experienced adverse selection but not moral hazard.

1. Introduction

The Medicare prescription drug benefit (Part D) reduced the fraction of senior citizens with no drug coverage from 23 percent to only 7 percent (Levy and Weir, 2007). What impact did gaining coverage have on new enrollees' utilization and out-of-pocket spending? In this paper, we use data from the 2004 and 2006 waves of the Health and Retirement Study to estimate these impacts. We estimate both the extent of adverse selection into Part D – did beneficiaries with high existing demand for prescription drugs disproportionately choose to enroll in the program? – and the impact of Part D on utilization and expenditure of those newly enrolled in Part D. For comparison, we also estimate changes in utilization and spending between 2004 and 2006 for those who were consistently covered by employer-sponsored insurance or Medicare HMOs; and those who had no drug coverage in 2004 or 2006.

2. Background

Medicare Part D made prescription drug insurance coverage available to many senior citizens for the first time. Because price elasticities of demand for prescription drugs are generally at least as large as those for other types of medical care (Leibowitz, Manning and Newhouse, 1985), we would expect expansions of coverage to result in a substantial increase in both use of and total spending on prescription drug use among the newly insured population.¹ We would also expect their out-of-pocket spending on prescription drugs to decline. Neuman et al. (2007), analyzing 2006 survey data linked to CMS administrative records, report that Part D enrollees had higher out-of-pocket spending and cost-related non-adherence than seniors with employer or VA coverage. Lichtenberg and Sun (2007) and Yin et al. (2008), each using data from a single national pharmacy chain, estimate that there were significant increases in drug

¹ In the RAND Experiment, patients in the free care plan spent about 60 percent more on prescription drugs than patients

utilization and decreases in spending among Part D enrollees. Because these studies have very different data, they address somewhat different questions; taken together, they paint a picture in which Part D coverage increases utilization and reduces out-of-pocket spending for new beneficiaries, but is not as generous as employer coverage. Our analysis of panel data from the Health and Retirement Study will confirm this view.

3. Data

The Health and Retirement Study (HRS) has collected data since 1992 on the employment, health, income, insurance coverage, and wealth of a sample of individuals over the age of 50. HRS now represents the full population of Medicare beneficiaries over age 65. Our analysis uses data from the 2004 and 2006 waves of HRS. In all, our sample includes 9,322 Medicare-covered individuals who were present in both the 2004 and the 2006 waves of the survey, were covered by Medicare in both years, and were at least 65 years old in 2004. We use data from the HRS to define respondents' drug coverage and to estimate their use of and out-of-pocket spending on prescription drugs, as well as measures of "unmet need" for prescription drugs, as follows.

A. Defining respondents' prescription drug insurance coverage

In the 2004 HRS, respondents had as many as three opportunities to provide information about insurance coverage for prescribed medicines:

- Respondents with Medicare or Medicaid insurance coverage are asked if they get these benefits through an HMO. If they do, they are asked whether the Medicare/Medicaid HMO covers prescription drugs (and other questions about that HMO).

- For up to three private insurance plans, respondents report the source of coverage (own employer, spouse's employer, privately purchased, etc.) and whether or not the plan covers prescription drugs.
- In the section on utilization of medical care, all respondents are asked whether they regularly take any prescription medications. If they do, they are asked "Have the costs of your prescription medications been completely covered by health insurance, mostly covered, only partially covered, or not covered at all by insurance?" Respondents who do not regularly take any prescription drugs are asked whether they have insurance coverage that would cover the cost of drugs if they took any. All respondents are asked to provide the name of the plan that covers or would cover prescription drug expenses.

The 2006 HRS includes an additional question to the beginning of the sequence on insurance coverage. Immediately after asking respondents about whether they have Medicare, before any of the questions listed above are asked, respondents are asked "Beginning in 2006, Part D of Medicare provides coverage for prescription drugs. Have you signed up for the new Medicare prescription drug coverage?" Other questions about Part D, including whether or not the person applied for the SSA subsidy, follow.

Based on this information, we assign respondents prescription drug coverage in the following hierarchical order (that is, if a respondent reports more than one of these types of coverage, s/he is assigned the first one in this list):

1. **Employer coverage** (including CHAMPUS/Tricare)
2. **Medicaid**
3. **Medicare HMO**
4. **Part D** (2006 only)

5. **Privately purchased** drug coverage; this category includes both respondents who report having a private non-group insurance policy that covers prescription drugs and respondents who do not report any of the above types of coverage but who report that their prescription drugs are or would be covered by insurance.²
6. **No coverage** is assigned to respondents with none of the above types of coverage.

Table 1 shows the distribution of respondents in our sample by their prescription drug coverage in 2004 and 2006.

B. Prescription drug use

The HRS asks respondents in the context of questions about their health (Section C) whether they take drugs for five common conditions. Respondents who do not report taking drugs for any of these conditions are subsequently asked in the context of questions about insurance and use of medical care (Section N) whether they take any prescription medications regularly. In addition, in 2006, respondents were asked about whether they take medications for an additional set of conditions. Here are the lists of conditions about which HRS asks:

The “short list” of conditions (asked in both 2004 and 2006):

1. Hypertension
2. Diabetes
3. Heart conditions (heart problem, attack, angina or chest pain, congestive heart failure)
4. Stroke
5. Psychiatric conditions (Do you now take tranquilizers, antidepressants, or pills for nerves?)

² In a few cases, we recode responses based on the name of the plan respondents say is covering/would cover their drug expenses (e.g. “Medicaid” and “CHAMPUS” are recoded appropriately).

The additional conditions queried in 2006 section N:

6. Cholesterol
7. Pain
8. Asthma/allergies
9. Gastrointestinal problems
10. Sleep problems
11. Anxiety or depression

Table 2 summarizes the fraction of respondents in each year who report taking a drug on the short list of five conditions, taking a drug on the “long list” of all eleven conditions, and those who are taking a drug that is not listed. A number of observations about these lists are relevant for our analysis. First, the short list does a reasonably good job at identifying most people who take some drugs regularly: 78 percent of them in 2004 and 80 percent in 2006. However, more than half of those who do not report taking a drug for any condition on the short list are in fact taking some prescription drugs regularly. Second, the long list does a better job than the short list, correctly identifying 93 percent of those with regular prescription drug use. Two-thirds of those who do not report taking drugs for any condition on the long list are in fact not taking any prescription drugs regularly. Finally, very few regular prescription drug users take drugs for more than three of the conditions on the short list (less than two percent) or more than five conditions on the long list (less than eight percent) so that we topcode these responses at 3 and 5, respectively, in our analysis.

C. Out-of-pocket spending for drugs

The HRS asks respondents to report their average monthly out-of-pocket spending on prescription drugs since the previous interview. The 2004 data generally benchmark well to

comparable data from the Medical Expenditure Panel Study, although there is some concern that a small fraction of HRS respondents are mistakenly reporting their out-of-pocket spending for the entire two-year period since the last survey wave, rather than average *monthly* out-of-pocket spending over that period; please see the appendix for more details. Because of this potential mismeasurement, our analysis relies on medians, quantile regressions, and other methods that are likely to be relatively unaffected affected by the potential presence of outliers.

The 2006 HRS questions about out-of-pocket spending were modified in order to capture more accurately the impact of Part D on out-of-pocket spending. In particular, the recall period used for out-of-pocket drug spending questions was tailored to the individual respondents' experience with Part D. Respondents who do not have Part D coverage, and those who have Part D but report that their use and spending did not change as a result of Part D, are asked questions like those in 2004 about average monthly out-of-pocket spending in the two years since the last interview. Respondents with Part D coverage who report a change in either utilization or spending as a result of Part D are asked, instead, about average monthly out-of-pocket spending for prescription drugs in the twelve month period just before they got part D coverage and also, separately, the twelve-month period just after getting Part D coverage. Therefore, 2006 out-of-pocket spending for those with Part D coverage who reported a change in spending as a result of Part D (which is most respondents with Part D) should reflect the respondent's out-of-pocket spending with Part D coverage.³

D. Other outcome measures

We also analyze two indicators of “unmet need” for prescription drugs that are available in the HRS. The first of these is the ratio of the number of conditions for which a prescription is

³ Preliminary sensitivity analyses using data for Part D enrollees from the 2006 question sequence about spending just prior to Part D suggests even larger declines in out-of-pocket spending for those newly insured by Part D than does the analysis using 2004 spending data.

taken to the number of conditions. The second is the respondent's report of cutting back on medications due to cost. Specifically, respondents are asked "Sometimes people delay taking medication or filling prescriptions because of the cost. At any time [since the last interview date/in the last two years] have you ended up taking less medication than was prescribed for you because of the cost?" We code those who respond "yes" to this question as having cut back on medications.

4. Results

A. Selection into the program on the basis of spending, health status, and prescription use among the uninsured in 2004

About half of those with no drug coverage in 2004 were enrolled in a stand-alone Part D plan in 2006. Compared with those who remained uninsured or signed up for other kinds of coverage, those choosing Part D were more likely to be regular users of prescription drugs, as shown in Table 3. The differences across groups are all significantly different from zero with $p < 0.05$, except for the 5 percentage point difference between those with Part D and employer coverage in 2006 ($p = 0.14$). Those who signed up for Part D were more likely to be "heavy users" (3 or more prescriptions taken regularly) than other groups, with the exception of those who obtained employer coverage, to whom the Part D enrollees look similar on this dimension. They also had higher out-of-pocket spending in 2004: \$100 at the median, compared with \$30 for those who remained uninsured.

Unmet need is also higher in 2004 among the uninsured who will subsequently enroll in Part D. Fourteen percent of this group reports cutting back on medications due to cost, compared with only 8 percent of those without drug coverage in either 2004 or 2006. This evidence of selection into program emphasizes the need to control for earlier use in order to estimate

“impacts” of the program on coverage. Comparing the out-of-pocket spending of individuals with no drug coverage in 2006 to those with Part D in 2006 (a cross-sectional “estimate” of the impact of Part D) is potentially very misleading, since enrollees had higher use to begin with.

B. Changes in prescription drug use for program enrollees

Table 4 shows that there is only a slight increase in the probability of regular prescription drug use among those who gain coverage by signing up for Part D (89 percent in 2006 versus 86 percent in 2004). Respondents who were consistently insured or uninsured experienced comparable changes of about one or two percentage points. The number of conditions for which prescriptions are taken increases by about one-tenth of a prescription for all groups. Thus, there does not seem to be a large demand response. This is surprising given the relatively high price elasticity of demand for prescription drugs documented in the RAND experiment (Leibowitz, Manning and Newhouse 1985).

In order to better understand the lack of an apparent demand response to the change in insurance coverage, Table 5 breaks out the results on use by the condition for which use is reported. It is clear from this table that there are no increases in use of drugs among those newly enrolled in Part D compared to those with consistent employer coverage for any condition except stroke. The stroke result is difficult to interpret for two reasons. First, most of the relative increase among the Part D group is driven by a decline in medication use, conditional on having had a stroke, among those with employer coverage. Second, it is not clear how specific the concept of “medications for stroke” is, or how accurate respondents might be in reporting it, since most medications given to stroke patients are intended to reduce cholesterol or blood pressure or both – the same treatments used by patients with hypertension or heart disease. Indeed, almost all HRS with stroke (89%) also have either hypertension or heart disease or both;

85% of respondents who report taking medication for stroke also report taking it for heart disease or hypertension. Thus, the results by condition confirm the view that there are not across-the-board increases in use of prescription drugs as a result of Part D.

Perhaps even more surprising (going back to Table 4) is that the fraction of respondents who report cutting back on medications due to cost does not change much. In 2004, 13.7 percent of the uninsured who would subsequently sign up for stand-alone Part D reported such cutbacks; in 2006 the fraction was 12.1 percent. The consistently uninsured experienced an even larger reduction in cutbacks due to cost (7.9 percent in 2004 versus 6.1 percent in 2006). The “use ratio” – the fraction of conditions for which a prescription medication is taken – also does not change much for those newly covered by Part D (79 percent in 2004 and 80 percent in 2006).

C. Changes in out-of-pocket spending for program enrollees.

Part D may have had little effect on the use of medications, but it had big effects on spending for those who had previously been uninsured. Median spending for the newly insured group dropped from \$100 in 2004 to \$40 in 2006; for the other groups shown in table 4 with consistent coverage or no coverage in either year, the median either did not change or declined by only \$5. Changes at the 75th percentile (\$200 in 2004, \$100 in 2006) and 90th percentile (\$400 in 2004, \$200 in 2006) are equally striking. In effect, Part D cut new enrollees’ out-of-pocket spending in half. Respondents with other insurance show no comparable changes in the distribution of spending.⁴ New Part D enrollees are much more likely than the comparison groups to report declines of \$10 or more in out-of-pocket spending, and are less likely to report increases greater than \$10. The median change in out-of-pocket spending is a decline of \$30 for

⁴ The exception is high spenders who were consistently enrolled in Medicare HMOs. The 90th percentile of out-of-pocket spending for those with consistent Medicare HMO coverage declined from \$206 in 2004 to \$110 in 2006. This, too, may have been an effect of Part D.

new Part D enrollees and zero for the comparison groups. In short, Part D significantly reduced out-of-pocket spending among new enrollees.

D. Respondent reports versus respondent perceptions of changes in use and spending

Table 6A shows that respondent perceptions of how Part D changed their use of and spending for medications largely match the changes we calculate based on their reports of use and spending. Focusing on respondents with no drug coverage in 2004 and stand-alone Part D in 2006, 82 percent that their use of prescription drugs did not change as a result of Part D, which is very close to the 79 percent whom we calculate to be taking the same number of medications that they were in 2004. Respondents are more likely to report that their use did not change and less likely to report that it went up, compared with our calculation; but this makes sense, since the question about respondent perceptions asks specifically about whether use changed as a result of the change in insurance coverage. For some individuals, their use will change over time because their health status changes (and most of these are likely to be increases in use, given respondents' ages). We measure these changes over time as increases, but respondents might accurately respond to the question about changes in response to Part D by saying their use did not change. A cross-tabulation of these two measures (that is – are the people who tell us their use did not change the same ones whose use we do not think changed?) shown in Table 6B confirms that respondents' subjective changes of use and the changes in their reports of use match up reasonably well.

Respondents' subjective perceptions of how Part D affected their out-of-pocket spending match the estimated changes in reported spending reasonably well also. Overall, 56 percent of those with new Part D coverage report that their costs went down, compared with our estimate of 64 percent (Tables 6A and 6B).

5. How good is Part D coverage compared to group coverage?

How good is Part D coverage? In order to find out, we compare the gradient in out-of-pocket spending with respect to the number of medications taken for those with Part D to those with employer coverage. Table 7 shows the median, 75th percentile and 90th percentile of oop spending for individuals with consistent employer-sponsored coverage and those who are newly covered by Part D as a function of the number of conditions for which they take medications, stratified by self-reported health status. This table uses the “extended list” of conditions and topcodes the number of medications at 5 as described above in the section on data. It is clear that conditioning on health status, those with Part D pay more out-of-pocket for a given number of medications at the median and both the 75th and 90th percentiles. That is, Part D is not as generous as employer coverage. Table 8 confirms this by summarizing the effects in a quantile regression framework. The table reports the results from 12 separate quantile regressions; the entry in the table is the coefficient on the variable “number of conditions for which a medication is taken.” Controlling for age and health status makes relatively little difference in the relative generosity of Part D compared with employer coverage. At the median, an additional medication costs someone with group coverage about \$10, compared with about \$17 for a Part D beneficiary. At the 75th percentile the marginal out-of-pocket costs are \$16 to \$20 for an individual with group insurance compared to about \$30 for someone with Part D, and at the 90th percentile the corresponding amounts are \$30 and \$50. The results are qualitatively similar if we enter the number of medications using a set of dummies or if we re-estimate the models using all individuals with group coverage or Part D in 2006, without regard to 2004 coverage status.

6. Conclusion

Our evidence suggests that Part D did not significantly increase the use of prescription drugs among new beneficiaries, but did significantly reduce their out-of-pocket spending. Somewhat surprisingly, cost-related noncompliance with prescribed medications did not decline significantly among those newly covered by Part D. Part of the explanation for this may lie in the fact that Part D coverage is not as good as employer coverage at protecting beneficiaries from out-of-pocket costs. Clearly, further research is necessary to understand the impacts of Part D on beneficiaries' utilization and spending.

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Table 1
Cell sizes by prescription drug coverage in 2004 and 2006

Drug coverage in 2004:	Drug coverage in 2006:						Total
	Employer	Medicaid	MedHMO	Part D	Purchase	None	
Employer	2,076	36	176	276	290	57	2,911
Medicaid	21	605	37	127	40	18	848
MedHMO	132	38	794	85	73	17	1,139
Purchase	594	125	192	734	441	128	2,214
None	133	94	157	1,147	210	469	2,210
Total	2,956	898	1,356	2,369	1,054	689	9,322

Table 2
How much regular prescription drug use do the HRS condition lists capture?

	Short list 2004	Short list 2006	Long list 2006
No drugs	0.14	0.11	0.11
Listed drugs	0.67	0.71	0.83
Unlisted drugs	0.19	0.18	0.06
Total	1.00	1.00	1.00

Notes:

“Short list” conditions are hypertension, diabetes, heart conditions, stroke, and psychiatric conditions. The “long list” includes, in addition, high cholesterol, pain, asthma/allergies, gastrointestinal problems, sleep problems, and anxiety or depression.

Please see the text for further explanation of this table.

Table 3
Selection into Part D by those with no drug coverage in 2004

	2006 Rx Coverage						Total
	Employer	Medicaid	MedHMO	Part D	Purchase	None	
Fraction with regular Rx use	0.811	0.773	0.782	0.871	0.807	0.726	0.821
Number of Rx taken	1.1	1.0	1.1	1.2	1.0	0.9	1.1
Fraction with ≥ 3 Rx	0.059	0.012	0.023	0.061	0.023	0.017	0.044
Out-of-pocket Rx spending in 2004:							
Any?	0.783	0.745	0.772	0.857	0.783	0.708	0.804
25 th percentile	\$7	\$0	\$6	\$25	\$8	\$0	\$15
Median	44	65	60	100	48	33	60
75 th percentile	100	200	168	200	130	100	175
90 th percentile	300	350	300	400	300	250	317
# medications/ # conditions, 2004	0.756	0.713	0.816	0.791	0.776	0.745	0.778
Cut back on Rx due to cost, 2004	0.046	0.292	0.106	0.122	0.138	0.076	0.112
Fair or poor health	0.195	0.503	0.239	0.287	0.309	0.2	0.267
Age	78.3	77	77.2	77	78.2	77.6	77.3
Sample n	133	94	157	1,147	210	469	2,210

Table 4
Changes in use and spending for previously uninsured enrollees compared with consistently insured or consistently uninsured

	Insurance status in 2004 and 2006				
	Coverage in 2004:	Employer	MedHMO	Uninsured	Uninsured
	Coverage in 2006:	Employer	MedHMO	Part D	Uninsured
Measures of use					
Fraction with regular Rx use in 2004		0.892	0.879	0.871	0.726
Fraction with regular Rx use in 2006		0.922	0.883	0.898	0.741
Number of medications, 2004		1.2	1.2	1.2	0.9
Number of medications, 2006		1.3	1.3	1.3	0.9
Measures of unmet need					
Cut back on Rx due to cost, 2004		0.015	0.085	0.122	0.076
Cut back on Rx due to cost, 2006		0.020	0.065	0.116	0.059
Cut back on Rx due to cost if user, 2004		0.016	0.093	0.133	0.094
Cut back on Rx due to cost if user, 2006		0.021	0.071	0.124	0.068
# medications/# conditions, 2004		0.824	0.834	0.791	0.745
# medications/# conditions, 2006		0.839	0.816	0.805	0.759
Out-of-pocket Rx spending					
2004: median		25	30	100	33
2004: 75 th percentile		60	70	200	100
2004: 90 th percentile		150	200	400	250
2006: median		25	27	40	25
2006: 75 th percentile		60	65	100	82
2006: 90 th percentile		120	103	200	200
Spending went down by \$10 or more		0.278	0.349	0.561	0.309
Spending changed \$10 or less		0.427	0.389	0.226	0.433
Spending went up by \$10 or more		0.294	0.256	0.190	0.256
Change in spending, 2006 – 2004:					
10 th percentile		-70	-130	-295	-100
25 th percentile		-16	-30	-125	-20
50 th percentile		0	0	-30	0
75 th percentile		19	13	1	15
90 th percentile		55	55	54	70
Other characteristics					
Fraction in fair or poor health		0.211	0.252	0.287	0.20
Mean age		75.2	75.7	77.0	77.6
Sample n		2,076	794	1,147	469

Table 5
Changes in Prescription Drug Use for Specific Conditions, 2004 to 2006

	Insurance status in 2004 and 06:				
	Coverage in 2004:	EHI	Mc HMO	None	None
	Coverage in 2006:	EHI	Mc HMO	Part D	None
Hypertension					
Fraction with any Rx for this condition, 2004		0.566	0.530	0.545	0.408
Fraction with any Rx for this condition, 2006		0.614	0.559	0.592	0.438
Fraction with the condition, 2004		0.609	0.574	0.593	0.458
Fraction with the condition, 2006		0.646	0.615	0.635	0.488
Fraction of those with the condition who report Rx for it, 2004		0.930	0.923	0.920	0.891
Fraction of those with the condition who report Rx for it, 2004		0.949	0.908	0.932	0.899
Diabetes					
Fraction with any Rx for this condition, 2004		0.154	0.132	0.132	0.061
Fraction with any Rx for this condition, 2006		0.178	0.164	0.147	0.076
Fraction with the condition, 2004		0.183	0.162	0.174	0.099
Fraction with the condition, 2006		0.205	0.197	0.192	0.120
Fraction of those with the condition who report Rx for it, 2004		0.842	0.814	0.761	0.619
Fraction of those with the condition who report Rx for it, 2004		0.869	0.833	0.765	0.638
Heart disease					
Fraction with any Rx for this condition, 2004		0.228	0.189	0.204	0.137
Fraction with any Rx for this condition, 2006		0.263	0.230	0.248	0.162
Fraction with the condition, 2004		0.316	0.258	0.299	0.235
Fraction with the condition, 2006		0.353	0.306	0.333	0.248
Fraction of those with the condition who report Rx for it, 2004		0.721	0.732	0.684	0.582
Fraction of those with the condition who report Rx for it, 2004		0.744	0.751	0.744	0.656
Stroke					
Fraction with any Rx for this condition, 2004		0.034	0.029	0.034	0.018
Fraction with any Rx for this condition, 2006		0.030	0.036	0.050	0.017
Fraction with the condition, 2004		0.072	0.064	0.074	0.063
Fraction with the condition, 2006		0.083	0.084	0.103	0.061
Fraction of those with the condition who report Rx for it, 2004		0.476	0.448	0.460	0.284
Fraction of those with the condition who report Rx for it, 2004		0.358	0.424	0.485	0.280
Psychiatric conditions					
Fraction with any Rx for this condition, 2004		0.057	0.070	0.054	0.045
Fraction with any Rx for this condition, 2006		0.073	0.076	0.069	0.046
Fraction with the condition, 2004		0.098	0.111	0.116	0.083
Fraction with the condition, 2006		0.113	0.120	0.136	0.080
Fraction of those with the condition who report Rx for it, 2004		0.588	0.634	0.467	0.543
Fraction of those with the condition who report Rx for it, 2004		0.644	0.637	0.505	0.571
Other regular Rx use – none of the above conditions					
Fraction with any Rx for this condition only, 2004		0.198	0.222	0.209	0.197
Fraction with any Rx for this condition only, 2006		0.183	0.195	0.187	0.186

Table 6A
Respondent perceptions of changes in use and spending as a result of Part D
Respondents with no drug coverage in 2004 and stand-alone Part D in 2006

	Up	Down	The same
Change in Rx use			
Respondent perception	0.052	0.129	0.820
Our calculation, based on r report	0.175	0.038	0.787
Change in out-of-pocket Rx spending			
Respondent perception	0.147	0.562	0.291
Our calculation, based on r report	0.202	0.637	0.161

Table 6B
...but are they the same people?

Change in Rx use: cell fractions

Our calculation:

Respondent perception:	Up	Down	The same	Total
Up	0.012	0.004	0.036	0.052
Down	0.027	0.004	0.097	0.129
The same	0.135	0.030	0.655	0.820
Total	0.175	0.038	0.787	1.000

Out-of-pocket Rx spending: cell fractions

Our calculation:

Respondent perception:	Up	Down	The same	Total
Up	0.033	0.090	0.024	0.147
Down	0.076	0.416	0.071	0.562
The same	0.094	0.131	0.066	0.291
Total	0.202	0.637	0.161	1.000

Notes: There is item nonresponse for the respondent perception variables; unweighted sample size is 976 (change in use) and 949 (change in out-of-pocket spending) compared with 1,147 total in this category.

Table 7
The gradient in out-of-pocket spending by number of Rx conditions and health status
For those consistently covered by employer-sponsored insurance and those newly covered by Part D

Self-reported health status, 2006													
Excellent			Very good		Good		Fair		Poor		All		
EHI	Part D		EHI	Part D	EHI	Part D	EHI	Part D	EHI	Part D	EHI	Part D	
Number of conditions with Rx:													
Median													
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	10	30	15	33	17	30	23	29	25	23	15	30	
2	25	30	25	55	30	54	40	60	20	50	30	50	
3	30	22	30	55	40	88	51	85	55	140	40	70	
4	30	100	30	50	55	35	65	120	65	69	50	60	
5	200	-	30	75	35	60	50	50	60	98	45	70	
75 th percentile													
0	0	0	0	0	0	0	0	0	0	0	0	0	
1	26	70	36	60	35	70	64	71	70	50	35	70	
2	50	80	50	100	66	100	80	100	50	70	60	100	
3	65	40	60	100	80	150	100	150	100	200	78	150	
4	70	100	50	71	125	90	100	200	100	120	100	150	
5	200	-	45	99	100	200	100	152	100	200	100	180	
90 th percentile													
0	0	0	0	0	0	0	0	0	0	0	0	0	
1	50	100	60	100	60	125	150	200	90	100	70	125	
2	80	130	100	154	120	170	120	152	150	160	100	154	
3	150	40	100	200	150	350	152	200	200	210	150	210	
4	100	100	150	200	152	152	200	300	200	206	152	220	
5	200	-	100	121	200	300	170	350	200	300	200	300	

Table 8
Gradient in out-of-pocket Rx spending with respect to number of medications
Quantile regressions: coefficient on number of medications

	Median		75 th percentile		90 th percentile	
	<u>EHI</u>	<u>Part D</u>	<u>EHI</u>	<u>Part D</u>	<u>EHI</u>	<u>Part D</u>
No controls	10.7 (0.5)	18.3 (1.1)	20.0 (0.6)	32.8 (2.1)	33.3 (2.4)	50.0 (3.8)
Controls for age & health status	9.6 (0.1)	17.0 (0.5)	16.0 (1.0)	29.3 (1.7)	30.8 (2.2)	50.0 (3.7)
Sample n	2,076	1,147	2,076	1,147	2,076	1,147

Note: Coefficients for EHI and Part D regressions are significantly different from one another with $p < 0.01$ in every case.

Appendix: Benchmarking HRS data on out-of-pocket drug spending to MEPS

The HRS asks respondents about out-of-pocket spending for any prescription drugs that the respondent takes regularly. The question is worded as follows: “On average, about how much have you paid out-of-pocket per month for these prescriptions in the last two years?” A small fraction of respondents report very high amounts, raising the concern that they are incorrectly reporting their total spending in the last two years. There is concern that some respondents are incorrectly reporting their *total* out-of-pocket spending in the past two years, rather than their average monthly out-of-pocket spending in the past two years. A comparison of the distribution of reported spending by respondents 65 and older in HRS 2004 with comparable data from MEPS shows that the HRS has much higher average spending (\$126 versus \$78), and that difference is driven entirely by the upper tail of the distribution. The medians are much closer together (\$250 in HRS versus \$207 in MEPS) and the 75th percentiles match almost exactly (\$100 in HRS versus \$101 in MEPS). The difference becomes evident by the 90th percentile, though (\$350 in HRS versus \$288 in MEPS).

HRS also seems to miss a lot of small monthly out-of-pocket expenditures, since the fraction with any out-of-pocket spending is lower in HRS than in MEPS (77 percent versus 91 percent).

This concern led to the addition of a prompt in the 2006 survey in which interviewers read back very high responses and prompted respondents for whether this was in fact their average monthly spending during the two-year period. As a result, we think that the upper tail of the distribution in 2006 will be more accurate; but this might be confused with the effects of Part D. In order to avoid this confusion, the analysis in this paper estimates changes between 2004 and 2006 at the median and 75th percentile of the distribution of reported out-of-pocket spending which should not be affected by measurement error in the upper tail of the distribution.

Appendix Table 1
 Comparison of reported out-of-pocket monthly spending on prescription drugs in 2004
 HRS versus MEPS
 Respondents ages 65+ in 2004

	HRS	MEPS
Mean age	74.5	74.5
Mean out-of-pocket Rx spending	\$126	\$78
Fraction with any out-of-pocket Rx spending	0.77	0.91
Mean out-of-pocket Rx spending if >0	\$163	\$85
Percentiles of out-of-pocket Rx spending:		
P10	\$0	\$1
P50	32	38
P75	100	101
P90	250	207
P95	350	288
P99	1,200	503
Percentiles of out-of-pocket Rx spending, if > 0:		
P10	10	5
P50	55	45
P75	125	109
P90	300	216
P95	400	295
P99	1,800	516

Notes:

1. HRS data have some additional sample restrictions; these observations are from our merged 2004 – 2006 sample for analysis.
2. MEPS spending variable is annual; we calculate monthly spending by dividing by 12.
3. Age distributions once restricted to >64 are very similar (i.e. it's not just the means that match).
4. MEPS estimates are based on 2003 and 2004 MEPS data.