The Impact of Medicare Part D on Social Security Disability Insurance Beneficiaries

Amitabh Chandra Harvard University and NBER

Ning Fu University of Southern California

Seth A. Seabury^{*} University of Southern California and NBER

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Abstract

The introduction of Medicare Part D in 2006 provided access to prescription drug coverage to all Medicare beneficiaries, including those under 65 who were eligible through the Social Security Disability Insurance (SSDI). We used data from the Medical Expenditure Panel Study (MEPS) from 2001-2009 to examine the impact of Part D coverage on prescription drug spending, drug utilization and health of SSDI beneficiaries. We also considered the effect on other healthcare utilization and self-reported health. Using a difference-in-differences design, we compared outcomes between SSDI beneficiaries and those with private insurance to estimate the net impact of the program and to over 65 Medicare beneficiaries to estimate the differential impact between aged and disabled beneficiaries. We found that Part D increased spending on prescription drugs by SSDI beneficiaries by \$909.5 compared to the privately insured and by \$524 compared to aged Medicare beneficiaries. However, there was no increase in the number of medication fills, suggesting potential substation to more expensive medications. The effects were similar between those with and without dual Medicaid eligibility. Out-of-pocket spending decreased significantly for SSDI beneficiaries, particularly for those without dual-eligibility. Healthcare utilization decreased and self-reported health improved. There was no indication that the pool of SSDI beneficiaries changed because of the availability of prescription drug coverage based on observable factors.

1. Introduction

The Medicare Modernization Act of 2003 created the Medicare Part D program and introduced prescription drug coverage to Medicare beneficiaries. Implemented in 2006, Medicare Part D was intended to increase access to and reduce the financial burden of prescription medications for Medicare beneficiaries. Past work suggests that the program has been at least moderately successful in achieving these aims. Engelhardt and Gruber (2011) estimated that the introduction of Part D increased average prescription drug coverage by about \$525 per aged beneficiary per year and significantly reduced out-of-pocket spending on drugs.(1) Other findings were similar, indicating a modest but significant increase in drug utilization and spending.(2-5) There was little evidence of a direct effect on beneficiary health, as past studies found little effect of Part D on hospitalization rates or emergency department use.(6, 7)

Most of the prior research on the effects of Part D focused exclusively on aged beneficiaries; there have been few studies examining the impact of Part D on those individuals who receive Medicare eligibility because of their enrollment in the Social Security Disability Insurance (SSDI) program. Individuals with disabilities likely have greater demand for prescription medications, but they may struggle to afford them without insurance coverage. Thus, more generous prescription drug coverage could have significant impact on their health if it expands their access to necessary medications.

Identifying the effect of Part D on outcomes for SSDI beneficiaries is complicated by the fact that many of them are also dually-eligible for state Medicaid coverage. The dual-eligible would have had access to prescription drug coverage from Medicaid prior to the introduction of Part D but their coverage was automatically switched to Part D once the program was

introduced.¹ Failure to account for Medicaid dual-eligibility could cause one to understate the effects of Part D if their existing drug needs were met under their Medicaid coverage. However, some state Medicaid plans impose significant formulary restrictions to cut costs, meaning that the introduction of Part D could still have benefited those with Medicaid coverage in restrictive state.(9)

We used data from the Medical Expenditure Panel Study (MEPS) from 2001-2009 to examine the impact of Part D coverage on prescription drug spending and utilization for SSDI beneficiaries. We used a difference-in-differences design that compared outcomes between SSDI beneficiaries—specifically Medicare beneficiaries under 65—to those with private insurance to estimate the net impact of the program on outcomes. To test whether the program had differential effects on the young disabled compared to aged beneficiaries, we also estimated difference-in-difference models comparing outcomes for the under 65 and over 65 Medicare. To address the complication of Medicaid dual-eligibility, we stratified the under 65 Medicare sample according to whether individuals had any concurrent Medicaid coverage in the year.

As expected, the introduction of Medicare Part D substantially increased the availability of prescription drug coverage for SSDI beneficiaries who were not dual-eligible for Medicaid; the dual-eligible beneficiaries had high rates of prescription drug coverage before and after the program was introduced. SSDI beneficiaries had higher demand for prescription medications compared to over 65 Medicare beneficiaries or the privately insured before and after Part D, reflecting their relative poor health. We found that the introduction of Part D increased spending on prescription drugs by SSDI beneficiaries by \$909.5 compared to the privately insured and by

¹ One study examined the impact of Part D on individuals dually eligible for Medicare and Medicaid, many of whom are disabled.8. Basu A, Yin W, Alexander GC. Impact of Medicare Part D on Medicare–Medicaid dualeligible beneficiaries' prescription utilization and expenditures. Health services research. 2010;45(1):133-51. However, the analysis was restricted to those ag e 65+ so it would have excluded any SSDI beneficiaries.

\$524compared to aged Medicare beneficiaries. Contrary to expectations, spending increased significantly among the dual-eligible population, even though they had prescription drug coverage prior to the introduction of Part D. However, while spending on prescription medications increased we found no increase in the number of medication fills for the under 65 Medicare population. One explanation for this is that there was switching from less expensive, possibly generic, drugs to more expensive drugs.

While total spending rose, out-of-pocket (OOP) spending decreased significantly for SSDI beneficiaries. Total annual OOP spending fell for the under 65 Medicare beneficiaries by \$438 compared to the privately insured and \$310 compared to over 65 Medicare beneficiaries. The decrease was particularly share for those without Medicaid dual-eligibility, who paid a higher share of prescription drug costs OOP. Our estimates suggest that the decline in OOP for SSDI beneficiaries without dual-eligibility was equivalent to approximately a 2.7% increase in their total annual family income. For those with dual-eligibility, the increase was about 3%.

We also found that the introduction of Part D was associated with a significant decrease in the rate of inpatient hospitalizations for under 65 Medicare beneficiaries (about 5 percentage points in most specifications). It is possible that this decline in healthcare utilization was indicative of better health because of improved access to prescription drugs, or it could have reflected some sort of behavioral change (e.g., going to the hospital to obtain their medications). We found some evidence consistent with both explanations. Comparing the self-reported health of under 65 Medicare beneficiaries to the privately insured before and after 2006 suggested that there was a modest improvement for those affected by Part D. However, we also found a decline in the share of under 65 Medicare beneficiaries who reported receiving free samples in a year or who used a hospital or clinic pharmacy, which could would be consistent with them being less likely to visit a provider to obtain medication.

A limit of the difference-in-differences approach is that it cannot address the possibility that there were changes to the SSDI beneficiary pool coinciding, or possibly caused by, the introduction of Part D. This could have occurred if, for example, sicker individuals with higher demand for drugs were more likely to apply for SSDI to gain access to Part D coverage. We tested for changes in SSDI beneficiaries based on observable characteristics by regressing spending on individual demographics and the presence of chronic health conditions using pre-2006 data. We then examined trends in predicted drug spending for the full sample, and found no indication that the pool of SSDI beneficiaries changed noticeably after (or coinciding with) the introduction of Part D.

2. Data and Methods

We used data from the MEPS, a nationally representative survey on U.S. healthcare combing information from households, individuals, medical providers and employers. Collected and published by the Agency for Healthcare Research and Quality (AHRQ), the MEPS is the most complete, nationally representative, publicly available source of U.S. data on health, healthcare utilization and health insurance coverage. The data are based on information from three surveys of approximately 12,000 families and 30,000 individuals selected each year and followed over a two-year period. The first major survey is the Household Component (HC) that collects detailed data on demographic characteristics, health conditions, health status, use of medical services, charges and source of payments, access to care, satisfaction of care, health insurance coverage, income, and employment. The other major survey is the Insurance

Component (IC), which collects data on health insurance plans obtained through participants' private or public sector employers. The third is the Medical Provider Component (MPC) that collects data from healthcare providers and pharmacists used by the participants. The MPC is a follow-back survey with the purpose to replace or supplement data collected through HC, presumably making the data more accurate and reliable than a standard household survey.

Our analysis data came from the Full-Year Consolidated Data Files from the 2001-2009 MEPS. We only went up through the year 2009 to avoid any confounding from the myriad changes introduced to the U.S. health care system, including Medicare and Medicaid, by the 2010 Affordable Care Act. It also allows us to avoid potential compositional changes from the increase in SSDI claiming that began in 2007 due to the Great Recession (because of the two-year wait period, these individuals would mostly not receive Medicare eligibility until after 2009).(10) The Consolidated Files combine data from the three components of the MEPS and consolidated all final personal-level information for the full calendar year.

Only adult participants were included in the analyses. We identified respondents age 18+ with 12 months of Medicare coverage during the year and stratified them according to whether they were above or below age 65^2 ; refer those to under 65 or over 65 Medicare population. We then stratified the under 65 Medicare population according to whether they had any month of Medicaid coverage in the year and referred to those that did as the dual-eligible. We excluded the over 65 dual-eligible population because they are more likely to be in a long-term care facility or nursing home. Finally, we identified individuals age 18-64 who had 12 months of coverage from a private health insurer (though not necessarily prescription drug coverage).

² Almost all Medicare beneficiaries under 65 obtain their eligibility through SSDI, and we use the two terms synonymously in this paper.

We focused on the impact of Part D on multiple outcome variables. Following Engelhardt and Gruber (2011), we constructed two coverage variables to examine the impact of Part D on prescription drug insurance coverage: any prescription drug insurance coverage and public prescription drug insurance coverage. We used two sources of information to construct the coverage variables: one a question asking whether the participant has any prescription drug insurance coverage and the other descriptions of prescription drug payment sources. We define any prescription drug insurance coverage as the individual responding affirmatively that she has prescription drug coverage or indicating payment by an insurer. We define public prescription drug insurance coverage as having drug coverage either through Medicare or Medicaid.

To measure the impact on prescription drug spending and utilization we use the total dollars spent (from all payment sources) on prescription medications in the year, the total number of prescriptions filled (including refills) or an indicator for any prescription in the year. To capture the impact on the financial burden of SSDI beneficiaries, we also measured the total annual OOP spending across all medications.

For healthcare utilization, we constructed an indicator variable as to whether the individual had any inpatient hospitalization in the year as well as the total number of officebased provider visits. As a measure of health not based on health-care utilization, we also used as an outcome variable the respondent's self-reported health as of the final survey wave measured in the five-point Likert scale (from 1 to 5: excellent, very good, good, fair or poor). Finally, from the prescribed medicines files, we also recorded whether the individual reported getting a free sample for any of their medications in the year, or using a hospital, HMO or clinic-based pharmacy. We used a series of regression models to test for the effects of Part D while adjusting for potential differences between individuals that might be correlated with healthcare spending and utilization and also might differ by insurance status. These other covariates included age, sex, race/ethnicity, level of education and annual personal income. To control for differences in underlying health, we also included information on the presence of chronic health conditions, measured as ever being diagnosed with heart disease³, stroke, emphysema, diabetes or asthma. We also controlled for year fixed effects to capture the influence of aggregate time trends that have nothing to do with the passage of Part D.

We implemented these regression models as "difference-in-differences" regressions that compared the under 65 Medicare beneficiaries separately to under 65 privately insured individuals and to over 65 Medicare beneficiaries, before versus after 2006. Because the under 65 privately insured were presumably unaffected by Part D, the first set of regressions acted as our estimates of the total effect of Part D on outcomes. When we used the over 65 as a control group, this was our estimate of the differential effect of Part D on SSDI compared to aged beneficiaries. We hypothesized that there would be an increase in prescription drug spending and utilization and a greater reduction in OOP among Medicare beneficiaries compared to those with private insurance. Given their disability status and lower average income, we also hypothesized that the effects of Part D would be greater for SSDI beneficiaries compared to the over 65 Medicare population.

Most regressions were estimated using ordinary least squares. However, for self-reported health the most natural specification choice was an ordered logistic regression. Because logit coefficients and odds ratios can be difficult to interpret, we then took predicted probabilities for

³ The indicator for heart disease included the following conditions: high blood pressure, coronary heart disease, angina, myocardial infarction and other heart disease. Of these, high blood pressure was by far the most common, particularly among the under 65 Medicare population.

each response at the mean values of other covariates for under 65 Medicare beneficiaries before and after the introduction of Part D. These predicted probabilities reflect the hypothetical experiment where one person with the same observable characteristics is and isn't exposed to Part D coverage.

Following Engelhardt and Gruber (2011), we excluded 2006 data from all regressions because it was a transition year for many beneficiaries. We also used the MEPS person weights to account for the survey's complex design structure. Data on total drug spending was deflated into 2014 dollars using the medical component of the Consumer Price Index.

A key identifying assumption to our analysis was that the pool of SSDI beneficiaries did not change substantially over time in ways that confound their prescription drug or healthcare utilization. We attempted to test for this by predicting drug expenditures based on the observable characteristics of beneficiaries using data from 2001-2005. That is, we used the same covariates from our difference-in-differences models (minus the year fixed effects) and estimated regression models for under 65 Medicare beneficiaries alone using only pre-2006 data. Using the estimated parameters from that regression, we then generated predicted values of prescription drug spending and the number of prescriptions for the full sample (2001-2009). This allowed us to test whether there was any obvious change in the underlying sample characteristics of SSDI beneficiaries in terms of observable characteristics that predict demand for prescription medications.

3. Results

We identified 5,304 under 65 Medicare beneficiaries who met the inclusion criteria; 2,760 were Medicare only and 2,544 were dual-eligible (**Table 1**). There were 2,805 under 65

Medicare beneficiaries from 2001-2005 and 1,838 from 2007-2009. We also identified 25,351 single-eligible aged (65+) Medicare beneficiaries and 91,904 privately insured. The characteristics of individuals differed by beneficiary status in a predictable fashion (**Table 2**). The under 65 Medicare population was more likely to be nonwhite, have lower education and lower income than the over 65 Medicare population or the under 65 privately insured population. Those who were dual-eligible for Medicaid were more likely to be nonwhite and had worse education and lower income than the SSDI beneficiaries who were only eligible for Medicare. Heart disease was most common among the over 65 Medicare beneficiaries, while the rates of other forms of chronic illness were highest among SSDI beneficiaries.

Figure 1 and **Figure 2** report trends in the possession of any prescription drug insurance coverage and public prescription drug insurance coverage, respectively, by beneficiary status from 2001-2009. Figure 1 shows a remarkable increase in any prescription drug insurance coverage from 2005 to 2007 for the over 65 Medicare population. Under 65 Medicare beneficiaries who were dual-eligible for Medicaid had high rates of coverage before and after the introduction of Part D, but coverage rose sharply for those without Medicaid eligibility. Figure 2 demonstrates that the increase in coverage was primarily due to more public coverage; the increase in public insurance coverage for under 65 Medicare beneficiaries with no Medicaid coverage was roughly 40%.

The trend prescription drug spending, illustrated in **Figure 3**, appeared to support the hypothesis that Part D was associated with higher spending by SSDI beneficiaries. We found almost no change in spending for the privately insured and a modest increase for the over 65 Medicare beneficiaries. While spending was rising in the early 2000s for all groups, there does appear to be a trend break with higher spending growth among Medicare beneficiaries after

2006. Consistent with prior work by Engelhardt and Gruber (2011) and others, there was a modest increase in spending among the over 65 Medicare population. But the increase was more pronounced for the under 65 Medicare beneficiaries. That said, the presence of a pre-existing trend does raise questions about whether the cause of higher spending could be wholly explained by Part D. The impact of Part D on OOP spending for prescription drugs was more pronounced, particularly for the single-eligible, under 65 Medicare beneficiaries (**Figure 4**).

Unexpectedly, the trends displayed no increase in the number of prescriptions for under 65 Medicare beneficiaries (**Figure 5**). Despite the apparent increase in spending, the average number of prescription fills for the under 65 Medicare beneficiaries appears mostly unchanged before and after 2006. There was a small uptick in the number of prescription fills for the over 65 Medicare population, again consistent with prior evidence, but otherwise the average number of prescription fills appeared relatively unchanged.

Notably, the adoption of Part D was strongly associated with a decline in hospitalizations among SSDI beneficiaries (**Figure 6**). Both the single-eligible and dual-eligible under 65 Medicare beneficiaries display sharp drops in the rate of hospitalizations after the introduction of Part D. However, we saw no comparable change for the over 65 Medicare or privately insured populations.

The graphical findings were confirmed by the difference-in-differences models. We report the results from the regression estimates of the effect of Part D on prescription drug insurance coverage in **Table 3**. The top panel reports outcomes for the under 65 Medicare population to the privately insured, while the bottom panel shows the change in spending for the under 65 Medicare population compared to the over 65 Medicare population. In each panel, the first row reports the base difference and the second row reports the difference-in-differences

parameter. From Panel A we see that SSDI beneficiaries were less likely than the privately insured to have any drug coverage but more likely to have public drug coverage. The differencein-difference parameter shows that the introduction of Part D increased coverage by 14.9 percentage points, and increased public drug coverage by 24.3 percentage points. These effects were entirely driven by the non-Medicaid population; dual-eligible beneficiaries saw no increase in coverage relative to the privately insured.

From the bottom panel, we see that the introduction of Part D increased insurance coverage for SSDI beneficiaries without Medicaid by 7.2 percentage points. There was no difference in the increase in the increase in public insurance between the single-eligible Medicare beneficiaries according to whether they were over or under 65. These results suggest that while there was some crowd out of private insurance for SSDI beneficiaries receiving prescription drug coverage through Medicare, it was less than the crowd out that has been previously demonstrated for the over 65 population.(1)

We also found that prescription drug spending increased for SSDI beneficiaries after the introduction of Part D (**Table** 4). On average, the introduction of Part D was associated with a \$909 increase in prescription drug spending for the under 65 Medicare beneficiaries, \$845 in the single-eligible population and \$1,017 in the dual eligible population (the changes are similar in percent terms). However, total OOP fell significantly, with total annual OOP falling by \$438. The decrease was \$623 for those who were single-eligible and \$213 for those who were dual-eligible. This indicates that while the dual-eligible beneficiaries had some coverage prior to Part D, the Part D coverage they received was more generous.

From Panel B, overall prescription drug spending increased for SSDI beneficiaries compared to over 65 Medicare beneficiaries. Spending on prescription drugs increased by \$524

for under 65 beneficiaries compared to over 65, including \$449 for the single-eligible and \$645 for the dual-eligible. However, we also found that OOP decreased more for SSDI beneficiaries than the over 65 Medicare beneficiaries, particularly those who were not covered by Medicaid.

Also consistent with the graphical evidence, we found no change in the number of prescriptions for the under 65 Medicare beneficiaries compared to the privately insured (**Table 5**). The overall change was a decline of about 0.4 prescriptions per year. Compared to the over 65 Medicare population (Panel B), the prescriptions fell somewhat. While surprising, the estimates were imprecise and not statistically significant, we couldn't rule out a small increase in the number of prescriptions. One possible explanation for the increase in spending but lack of increase in quantity is that the introduction of Part D led to substitution from cheaper to more expensive medications. This might help explain why the findings are so similar between the Medicare only and dual-eligible beneficiaries. Medicaid often adopts restrictive "fail-first" step therapy or prior authorization policies that direct patients to generic medications. If these policies are used less in Part D, then this may have led some patients to switch to more expensive brand medications but not affected the total quantity of medications received.

The last three columns of Table 5 report the findings with respect to the changes in hospitalizations associated with Part D. As with Figure 6, there was a sharp decline in the hospitalization rate for the under 65 Medicare beneficiaries compared to either the privately insured or over 65 Medicare beneficiaries. There was about a 4 to 6 percentage point reduction in the number of SSDI beneficiaries hospitalized per year, regardless of the regression specification.

While hospitalizations are often used as a proxy for health outcomes, in practice they reflect a complex mix of patient health, patient choices and provider choices. The decline in

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hospitalizations found here could reflect improved patient health, or it could reflect behavioral change on the part of patients or providers. For example, a patient lacking prescription drug coverage may have been more likely to go to the hospital seeking medication. Similarly, a provider may have been more likely to admit them to get medications if the patient had medical coverage but not drug coverage.

To test for changes in patient health with a measure not directly based on healthcare utilization, we used ordered logistic regression to test the probability that an under 65 Medicare beneficiary reported being in better health after the introduction of Part D. The odds ratio in this regression on the difference-in-differences interaction for under 65 Medicare patients compared to the privately insured after 2006 was 0.698 (p<0.001), consistent with improved health after Part D (the Likert scale had worse outcomes ranked higher). To understand the magnitude of this effects, we computed the predicted values for each response for the under 65 Medicare patients with all variables except the difference in difference term held constant at their mean values (illustrated in **Figure 7**). The under 65 Medicare population report generally worse health overall before and after the introduction of Part D; by comparison, 68% of the privately insured report their health as either excellent or very good. However, there is a modest decline in the probability that an under 65 Medicare beneficiary reports being in fair or poor health after Part D is introduced, indicating an increase in perceived health or well-being.

One potential source of improved well-being that could have spilled over into selfreported health is if the introduction of Part D alleviated financial pressure on beneficiaries by alleviating their personal costs for prescription medications. This is consistent with our findings regarding the impact of Part D on OOP spending in Table 6. Based on the average family income in Table 2, the OOP reductions were equivalent to an almost 2.7% increase in total family income due to reduced OOP spending (about 3% for someone who was dual-eligible). It is conceivable that this kind of increase in spendable income could drive an increase in perceived well-being, causing someone to report better health.

Table 6 reports the difference and difference estimates of the effects of Part D on SSDI beneficiaries for some secondary outcomes. For these analyses, we only report the impact on SSDI beneficiaries overall, and do not break the results down by Medicaid eligibility. We tested the impact of Part D on cost-sharing – defined as OOP as a percent of total drug spending – and shows that it declined significantly, but only compared to the privately insured. We found that there was no effect on the percent of beneficiaries with at least one prescription in the year, and that the price per prescription rose.

We also found that the under 65 Medicare population was less likely to receive a free sample for one of their medications in the year and less likely to visit a pharmacy located in a hospital, HMO or clinic. While not conclusive, this is at least consistent with a behavioral change where individuals are less likely to seek free (or cheap) medications directly from providers. We also found a decrease in the number of office-based provider visits, which could be consistent with improved health or less medication-seeking behavior targeting providers.

Finally, **Figure 8** reports the average predicted spending on prescription medications for the under 65 Medicare only and dual-eligible populations by year. The regression that these predicted values were based on had an R^2 of 0.126, low but consistent with other regressions of healthcare spending. Compared to the overall trends in spending reported in Figure 1, there was little evidence of a change in predicted spending over time, either before or after the introduction of Part D. Thus, we were unable to find any evidence of changes in the pool of SSDI beneficiaries based on observable characteristics such as the presence of chronic health conditions.

4. Conclusions

We used nationally representative survey data from 2001-2009 to study the impact that the introduction of Medicare Part D had on outcomes for SSDI beneficiaries. As we expected, we found a significant increase in the availability of prescription drug insurance for SSDI beneficiaries. The increase was driven by those without dual Medicaid eligibility, and was larger than the increase for over 65 Medicare beneficiaries (indicating less crowd-out of private drug coverage). We found that prescription drug spending increased for SSDI beneficiaries after the introduction of Part D, and that it increased more than the spending by aged beneficiaries. However, it was surprising that we found no corresponding increase in the number of prescription fills. One possible explanation is that the availability of more generous drug coverage through Part D led to substitution from cheap generics to more expensive brand medications. Regardless, we found that Part D significantly reduced the cost-sharing burden on SSDI beneficiaries, particularly those who were not also dually-eligible for Medicare.

We also observed a sharp decline in hospitalizations among SSDI beneficiaries in response to Part D, which was surprising given that the availability of health insurance is usually not associated with an immediate change in health outcomes. It is true that the SSDI population is disproportionately made up of at-risk individuals with a need for prescription medications, such as those with significant behavioral health problems, and that expanding access to more or better medications could have significantly improved their health. Alternatively, it was possible that the decline we observed reflected not a change in health but a behavioral change resulting in

fewer hospital stays (if, say, beneficiaries had been going to the hospital to get prescriptions). We found some support for both hypotheses, with individuals responding more positively about their health but also reducing the use of health services that could be used to obtain lower-cost drugs (samples or hospital-based pharmacies).

Our study had limitations, such as comparatively small samples and somewhat loose definitions of SSDI beneficiary status and dual eligibility. We also were unable to control for state, which could matter for the dual-eligible population since the generosity of pharmacy benefits varies according to state. Future efforts should consider additional tests of the validity of our results, such as testing the importance of age cutoffs around age 65 or including group-specific time trends. Additionally, future work should directly consider whether there were changes in the types of medications consumed that could explain some of the observed findings and try to quantify the welfare effects on SSDI beneficiaries.

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Figure 1. Any Prescription Drug Insurance Coverage per Year by Beneficiary Status, 2001-2009

Source: Authors' calculations from the Medical Expenditure Panel Survey.



Figure 2. Public Prescription Drug Insurance Coverage per Year by Beneficiary Status, 2001-2009







Figure 4. Average Out-of-Pocket Prescription Drug Spending per Year by Beneficiary Status, 2001-2009



Figure 5. Average total number of prescriptions per year including refills by beneficiary status, 2001-2009



Figure 6. Percent of individuals with at least one inpatient hospitalization in the year by beneficiary status, 2001-2009



Figure 7. Predicted self-reported health of SSDI beneficiaries before and after the introduction of Medicare Part D

Source: Authors calculations from the Medical Expenditure Panel Survey. Predicted values are based on order logistic regression of self-reported health against other covariates held constant at the mean values for the under 65 Medicare sample. The differences pre- and post-Part D are based on the odds ratio for the difference-in-differences parameter for under 65 Medicare X post 2006 (odds ratio: 0.698; *p*-value<0.01).



Figure 8. Predicted spending on prescription medications by year for SSDI beneficiaries, 2001-2009

Source: Authors calculations from the Medical Expenditure Panel Survey. Predictions are based on linear regression of spending and number of fills against other covariates (minus year fixed effects) using the 2001-2005 sample years.

	Under 65, Medicare only	Under 65, Dual	Over 65, Medicare only	Under 65, Private	
Survey year:	· · ·		÷		
2001	226	130	2,726	10,043	
2002	331	274	3,287	12,511	
2003	296	309	2,744	10,067	
2004	287	331	2,796	10,042	
2005	299	322	2,723	9,810	
2006	330	331	2,897	9,883	
2007	323	270	2,657	9,234	
2008	297	265	2,600	9,673	
2009	371	312	2,921	10,641	
Total, Pre-2006	1,439	1,366	14,276	52,473	
Total, Post-2006	991	847	8,178	29,548	
Total, All years	2,760	2,544	25,351	91,904	

Table 1. Sample Sizes by Beneficiary Status and Year

	J			
	Under 65,	Under 65,	Over 65,	Under 65,
	Medicare only	Dual-eligible	Medicare only	Private
Age	53.0	47.1	75.0	41.9
Female	47.8%	52.0%	56.5%	51.1%
Race:				
White, non-Hispanic	74.0%	60.5%	86.1%	76.3%
Black, non-Hispanic	14.4%	21.5%	6.1%	8.3%
Hispanic	6.9%	10.8%	4.4%	8.7%
Asian	1.6%	3.1%	2.3%	5.2%
Other/Multiple	3.1%	4.1%	1.1%	1.5%
Ever diagnosed with:				
Heart disease	63.6%	54.8%	70.7%	24.1%
Stroke	11.6%	9.4%	10.3%	0.9%
Emphysema	8.1%	7.3%	5.4%	0.6%
Diabetes	23.7%	23.3%	17.6%	4.9%
Asthma	18.0%	21.8%	8.3%	8.8%
Family Income	16,102	10,475	26,610	42,140
Education:				
Less than HS	20.9%	33.5%	21.7%	8.3%
HS	59.8%	55.1%	52.5%	47.3%
Some college	19.3%	11.4%	25.7%	44.4%

Table 2. Summary Statistics by Beneficiary Status

Notes: Authors' calculations from the Medical Expenditure Panel Survey. Data are weighted to reflect the complex survey design of the MEPS. Percentages may not sum to 100% due to rounding error. Heart disease includes high blood pressure, coronary heart disease, angina, myocardial infarction and other heart disease.

Table 3. Difference-in-Differences Estimates of the Effect of Medicare Part D on Drug Insurance Coverage for Under 65 Medicare Beneficiaries Compared to the Privately Insured or Over 65 Medicare Beneficiaries

	(1)	(2)	(3)	(4)	(5)	(6)	
Outcome variable:	Any Drug Coverage			Public Coverage			
Linder (5 Medicere complet	A 11	Any Medicaid in year?		4 11	Any Medicaid in year?		
Under 65 Medicare sample:	All	No	Yes	All	No	Yes	
	Panel A	. Comparing U	nder 65 Medica	re Beneficiari	es to Privately	Insured	
Under 65 Medicare vs. Private	-0.209***	-0.319***	-0.0585***	0.489***	0.220***	0.856***	
Chaef 05 Wedleare vs. 1 Hvate	(0.0101)	(0.0147)	(0.0106)	(0.0115)	(0.0131)	(0.0113)	
Under 65 Medicare * Post 2006	0.149***	0.254***	0.0118	0.243***	0.425***	0.0139	
	(0.0129)	(0.0184)	(0.0158)	(0.0167)	(0.0222)	(0.0168)	
	Panel B. Comparing Under 65 Medicare Beneficiaries to Over 65 Medicare Beneficiaries						
Under 65 Medicare vs. Over 65	0.0450***	-0.0613***	0.235***	0.258***	0.0478***	0.697***	
Medicare	(0.0147)	(0.0178)	(0.0165)	(0.0168)	(0.0181)	(0.0184)	
Under 65 Medicare * Post 2006	-0.0330**	0.0715***	-0.169***	-0.206***	-0.0244	-0.438***	
	(0.0140)	(0.0190)	(0.0167)	(0.0180)	(0.0233)	(0.0181)	

Notes: The table reports linear regression estimates of the impact of Medicare Part D introduction on prescription drug spending, prescription fills and the probability of hospitalization. The Under 65 Medicare * Post 2006 is the difference-indifferences parameter estimate. Other covariates include age, sex, race, education, income, co-morbidities (measured as ever being diagnosed with heart disease, stroke, emphysema, diabetes, arthritis or asthma) and year fixed effects. Data come from the 2001-2009 Full-Year Consolidated Files of the Medical Expenditures Panel Survey (MEPS). Observations from 2006 are excluded in all regressions. Data are weighted to reflect the complex survey design of the MEPS. Robust standard errors reported in parentheses. A *, ** or *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

Table 4. Difference-in-Differences Estimates of the Effect of Medicare Part D on Prescription Drug Expenditures, Out-of-Pocket Drug Expenditures for Under 65 Medicare Beneficiaries Compared to the Privately Insured or Over 65 Medicare Beneficiaries

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome variable:	Total Rx expenditures		Total Out-of-Pocket Spending			
Under 65 Medicare complex	A 11	Any Medicaid in year?		A 11	Any Medicaid in year?	
Under 65 Medicare sample.	All	No	Yes	All	No	Yes
	Panel A	. Comparing U	nder 65 Medice	are Beneficiari	ies to Privately	Insured
Under 65 Medicare vs. Private	1,258***	1,121***	1,410***	551.0***	864.8***	121.2***
Shaer 05 Medicale VS. I Hvate	(70.27)	(92.77)	(102.6)	(38.97)	(63.46)	(24.28)
Under 65 Medicare * Post 2006	909.5***	845.5***	1,017***	-438.3***	-623.2***	-213.2***
	(164.0)	(207.0)	(264.3)	(45.31)	(72.32)	(34.67)
	Panel B. Comparing Under 65 Medicare Beneficiaries to Over 65 Medicare Beneficiaries					
Under 65 Medicare vs. Over 65	1,113***	1,010***	1,367***	400.6***	673.4***	-106.5***
Medicare	(93.55)	(106.1)	(125.1)	(50.64)	(68.97)	(35.45)
Under 65 Medicare * Post 2006	524.0***	448.9**	645.2**	-309.8***	-493.9***	-82.46**
	(167.4)	(208.8)	(266.4)	(47.35)	(73.29)	(38.85)

Notes: The table reports linear regression estimates of the impact of Medicare Part D introduction on prescription drug spending, prescription fills and the probability of hospitalization. The Under 65 Medicare * Post 2006 is the difference-in-differences parameter estimate. Other covariates include age, sex, race, education, income, co-morbidities (measured as ever being diagnosed with heart disease, stroke, emphysema, diabetes, arthritis or asthma) and year fixed effects. Data come from the 2001-2009 Full-Year Consolidated Files of the Medical Expenditures Panel Survey (MEPS). Observations from 2006 are excluded in all regressions. Data are weighted to reflect the complex survey design of the MEPS. Robust standard errors reported in parentheses. A *, ** or *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

Table 5. Difference-in-Differences Estimates of the Effect of Medicare Part D on Prescription Fills and Hospitalizations for Under 65 Medicare Beneficiaries Compared to the Privately Insured or Over 65 Medicare Beneficiaries

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome variable:	Tota	l number of Rx	fills	Any hospitalization in year		
	A 11	Any Medicaid in year?		A 11	Any Medicaid in year?	
Under 65 Medicare sample.	All	No	Yes	All	No	Yes
	Panel A	. Comparing Un	nder 65 Medica	re Beneficiarie	s to Privately I	Insured
Under 65 Medicare vs. Private	24.64***	22.73***	27.49***	0.139***	0.119***	0.168***
Chaef 05 Wiedleare V3. I livate	(1.001)	(1.226)	(1.639)	(0.0099)	(0.0130)	(0.0146)
Under 65 Medicare * Post 2006	-0.77	-0.98	-0.01	-0.055***	-0.048***	-0.062***
	(1.601)	(1.990)	(2.618)	(0.0143)	(0.0187)	(0.0219)
	Panel B. Comparing Under 65 Medicare Beneficiaries to Over 65 Medicare					
	Beneficiaries					
Under 65 Medicare vs. Over 65	24.15***	21.38***	28.10***	0.119***	0.119***	0.183***
Medicare	(1.266)	(1.426)	(1.892)	(0.0143)	(0.0166)	(0.0196)
Under 65 Medicare * Post 2006	-2.550	-2.685	-1.885	-0.0543***	-0.0478**	-0.0617***
	(1.620)	(2.006)	(2.569)	(0.0156)	(0.0197)	(0.0230)

Notes: The table reports linear regression estimates of the impact of Medicare Part D introduction on prescription drug spending, prescription fills and the probability of hospitalization. The Under 65 Medicare * Post 2006 is the difference-indifferences parameter estimate. Other covariates include age, sex, race, education, income, co-morbidities (measured as ever being diagnosed with heart disease, stroke, emphysema, diabetes, arthritis or asthma) and year fixed effects. Data come from the 2001-2009 Full-Year Consolidated Files of the Medical Expenditures Panel Survey (MEPS). Observations from 2006 are excluded in all regressions. Data are weighted to reflect the complex survey design of the MEPS. Robust standard errors reported in parentheses. A *, ** or *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	vs. Privately Insured	vs. 65+ Medicare
Share of Rx Spending paid OOP	-0.234*** (0.0125)	-0.0593 (0.0128)
Had any prescription in year	-0.0107 (0.0118)	-0.00317 (0.0110)
Price per prescription	9.655** (4.744)	8.425* (4.772)
Received a free sample in year	-0.0373** (0.0150)	-0.0152 (0.0159)
Used hospital/HMO/clinic pharmacy in year	-0.0265** (0.0131)	-0.00123 (0.0136)
Number of provider based office visits	-2.782*** (0.824)	-2.899*** (0.844)

Table 6. Difference-in-Differences Estimates of the Impact of Part D on Outcomes for SSDI Beneficiaries

Notes: Each coefficient is the difference-in-differences parameter estimate of under 65 Medicare beneficiaries compared to the privately insured or over 65 Medicare beneficiaries. Other covariates include age, sex, race, education, income, co-morbidities (measured as ever being diagnosed with heart disease, stroke, emphysema, diabetes, arthritis or asthma) and year fixed effects. Robust standard errors in parentheses. A *, ** or *** indicate statistical significance at the 10%, 5% or 1% level, respectively.