

Medicare Part D's Effects on Elderly Patients' Drug Costs and Utilization

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Objectives: To analyze Medicare Part D's net effect on elderly patients' use of and out-of-pocket (OOP) costs for prescription drugs and to compare these with standardized results from prior studies.

Study Design: Our dataset contains 1.4 billion prescriptions from Wolters Kluwer Health from December 2004 through December 2007 for patients whose age as of 2007 was more than 57 years.

Methods: Days' supply per capita, OOP cost per day's supply, and number of individuals filling prescriptions were compared before and after January 2006 for those over age 66 years versus those age 58-64 years. Adjustment was made for under-reporting of pure cash prescriptions in the data.

Results: Elderly patients' utilization in the first year of Part D increased compared with that of near-elderly patients by 8.1% for days' supply and 4.8% for the number of individuals filling prescriptions, and their OOP costs declined by 17.2%. Although elderly patients' OOP costs in the second year were reduced an additional 5.8%, days' supply increased by only an additional 1.0%. Correcting for the under-reporting of pure cash prescriptions yielded effects of 8.1% and -3.5% for days' supply and -15.6% and -7.2% for OOP costs in 2006 and 2007, respectively. A standardized comparison with previous estimates from Walgreens data showed that our utilization estimates were 2.6 times larger.

Conclusion: Part D lowered elderly patients' OOP costs and increased utilization, primarily during the first year of the program. Magnitudes vary substantially across studies because of differences in data and methods.

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After Medicare Part D was implemented in January 2006, it covered 53% of the elderly by mid-2006 (just after the end of open enrollment for 2006)¹ and 54% of the elderly by January 2007 (just after the end of open enrollment for 2007).² Despite substantial interest from policymakers and researchers alike, few large-scale studies of its effects exist. In this article we utilize a nationwide sample of prescriptions filled from December 2004 through December 2007 to consider how prescription drug utilization and out-of-pocket (OOP) costs changed for elderly patients compared with near-elderly patients during the first and second years of Medicare Part D. By using all elderly patients as the treatment group, we studied the aggregate impact of Part D: (1) direct effects experienced by those who added Part D as new coverage, (2) substitution effects for those for whom Part D replaced other coverage, and (3) indirect effects for those not covered by Part D but whose coverage was affected by Part D's existence.

Part D can affect elderly patients' net prescription drug utilization in several ways. First, Part D enrolled some elderly persons who previously lacked drug coverage; if demand is not perfectly inelastic, new coverage would increase the quantity of drugs consumed through lower OOP costs. To examine this extensive margin, we analyzed changes in the number of elderly filling any prescription before and after January 2006. Utilization also could have increased at the intensive margin for those previously covered if their coverage under Part D was more generous than their previous coverage (eg, because of lower patient OOP costs or fewer supply-side restrictions such as prior authorization requirements.) Conversely, net utilization could have decreased if prior coverage was more generous than Part D coverage or if employers responded to Part D's introduction by reducing the generosity of retiree coverage.

Two existing peer-reviewed studies also examined this aggregate effect. Both prior studies used data from only Walgreens pharmacies. Yin et al used data covering September 2004-April 2007 for those age 66-79 years, with the experience of those age 60-63 years as a control group.³ They found that Part D increased use of medications by 1.1% and OOP costs fell by 8.8% during the initial open enrollment period (January-May 2006). During the following 11 months (June 2006-April 2007), they found that utilization increased 5.9% and OOP costs decreased by 13.1%. Lichtenberg and Sun also used Wal-

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greens data to compare drug use among those age ≥ 65 years with those age < 65 years from September 2004 to December 2006; they found an increase of 12.8% in quantity and an 18.4% reduction in OOP costs.⁴ In this article we reconcile the seemingly disparate findings from these 2 studies and compare them with our own results, paying attention to the various strengths and weaknesses of each data source and method.

Studies on the effect of Part D on access to medications also have been conducted with survey data. Using the Health and Retirement Study, Levy and Weir found that although there was substantial take-up of Part D by the uninsured, prescription consumption did not appear to increase.⁵ Neuman et al conducted a survey of Medicare beneficiaries in fall 2006 and reported that, compared with employer coverage, OOP costs were higher under Part D.⁶ Before implementation of Part D, Pauly forecast that Part D would reduce elderly patients' OOP costs by 14% overall, by halving costs for the 25% who were uninsured.⁷ Using a 0.4 price elasticity of demand measure, he estimated a 6% increase in utilization as a result of Part D.

METHODS

Dataset

We analyzed a large dataset of prescriptions covering the period from December 2004 through December 2007 from Wolters Kluwer Health's Source Lx database.⁸ Our dataset comprises 1,417,366,769 prescriptions filled by 34,198,008 unique patients, whose age as of 2007 was ≥ 58 years. McKesson Corporation (formerly Per-Se Technologies, and NDCHealth before that) collects these data primarily from their switches that transmit electronic claims between pharmacies and third parties (eg, insurance companies and pharmacy benefit managers) that help pay for prescriptions. Source Lx covers all 50 states and includes approximately 31% of the nation's prescriptions, filled at approximately 32,000 pharmacies (not restricted to any particular pharmacy chains), including retail, mail-order, and hospital pharmacies, as well as other institutions that fill prescriptions such as long-term care facilities.⁸ The dataset includes prescription-fill level information on patient age, OOP costs versus third-party payment amounts, number of days' supply, the pharmacy's ZIP code, pharmacy type, and an encrypted patient identifier that tracks usage over time. Descriptive statistics are provided in the [eAppendix](#) (available at www.ajmc.com).

Comparison Groups

We compared 2 consistent cohorts: a group always age eligible for Medicare since January 2006 (age > 66 years as of 2007) versus a group always age ineligible for Medicare (age 58-64 years as of 2007). (Our data included the patients' birth

year but not month, so we excluded those who turned 65 during either 2006 or 2007. Because a small fraction of elderly persons are not eligible for Medicare and some persons under age 65 years are eligible, our treatment-control group definitions may cause small underestimates of the effects of Part D. See Lichtenberg and Sun.⁴) Using these groups, we made nationwide difference-in-difference comparisons of the aggregate change from January 2005 to December 2007. Use of a control group was important to separate Part D's effects from those of other factors that changed over time. For example, several widely used products such as Zolofit lost patent protection in 2006. To the extent that near-elderly patients also experienced the effects of these other changes, our method identified Part D's effects better than a simple comparison of 2005 data with 2006 data for elderly patients.

In addition to showing the aggregate effects of Part D for the first and second years of the program, we also report monthly estimates to consider how Medicare's effects varied during the initial open enrollment and transition period in early 2006, early in the calendar year before patients had met their deductibles, and later in the year when some entered the donut hole. To justify use of our control group, we used data prior to the implementation of Part D to validate the underlying assumption that the pre-part D time trend did not significantly differ between the 2 age groups.

Outcome Measures

We present results for 3 main outcomes: days' supply, number of patients filling prescriptions, and patient OOP costs per day's supply. We also analyzed total prescriptions filled, but we did not report these results separately because they were virtually identical to those for days' supply. Because our 2 utilization outcomes (days' supply and number of patients with prescriptions filled) were compared in terms of totals for the 2 cohorts over time, we had to adjust for different rates of mortality for the 2 cohorts, or we could have found relative decreases in total use occurring for the older cohort simply because of more deaths. To do this adjustment, we normalized our totals by the size of the national population estimated or projected by the US Census Bureau for each cohort at each point in time and report per capita changes.^{9,10} We report the percent changes over time in 3 outcomes to calculate the difference-in-difference impact of Medicare Part D.

Correction for Biases

Certain features of our dataset pose hurdles to estimating the impact of Part D on use of prescription drugs by the elderly and need to be explained up front. First, our data largely but not exclusively tracked the same pharmacies over time. This unbalanced panel could bias our results if the pharma-

cies that entered or left the data catered to a single age cohort disproportionately. To address this concern, we tested the robustness of our results on a panel of retail pharmacies that consistently reported data during our study period. These included 77.4% of the total days' supply in the full dataset.

Three sources of drug procurement are under-reported or absent in these data ("pure cash," mail order, and free samples). These may have systematically changed as a result of Part D, causing us to overestimate or underestimate the true impact of Part D on the actual quantity of medications

used by seniors.

Our data under-report pure cash transactions (where there is no third party to receive a claim) because they represent only 3.7% of our prescriptions but are thought to comprise approximately 12% of nationwide prescriptions for our age groups. Cash transactions for purchasers with drug discount cards, claims filled before deductibles were met, and rejected claims by insured people for uninsured (off-formulary) drugs are not subject to this under-reporting issue. This under-representation of pure cash transactions could have caused us to overestimate the effects of Part D to the extent that Part D disproportionately shifted elderly patients' 2005 cash purchases not observed in our data to insured purchases observed in our data in 2006 and 2007. Second, mail-order pharmacies are under-represented in the Wolters Kluwer Health data; they represent 2.1% of scripts in our data, whereas they are 13.8% for all ages nationwide in 2007.¹¹ This under-representation would have caused us to underestimate Part D's utilization effects if Part D disproportionately increased elderly patients' use of mail-order pharmacies. Third, prescription sales data omit free samples by definition. That would have caused an overestimate of Part D's effects on actual drug utilization if Part D caused use of free samples to decrease.

To correct for the bias due to missing pure cash prescriptions, we used age- and year-specific estimates of the fraction of prescriptions filled that were pure cash when prescriptions with all payment sources were fully represented, as reported by Wolters

■ **Table 1.** Changes in Nationwide Prescription Drug Quantities Per Capita 2005-2007 by Age Cohort

Result	Days' Supply per Capita ^a		Difference ^c
	58-64 y ^b	>66 y ^b	
Section A: total			
2005-2006			
Difference	0.07	21.29	21.22
Percent change	0.04	8.14	8.10
2006-2007			
Difference	-4.28	-3.99	0.29
Percent change	-2.41	-1.41	1.00
2005-2007			
Difference	-4.21	17.30	21.51
Percent change	-2.37	6.61	8.98
Section B: prescriptions filled at a consistent panel of retail pharmacies			
2005-2006			
Difference	9.83	28.82	18.98
Percent change	7.71	15.27	7.56
2006-2007			
Difference	7.50	14.98	7.47
Percent change	5.46	6.88	1.43
2005-2007			
Difference	17.33	43.79	26.46
Percent change	13.59	23.21	9.62
Section C: prescriptions filled in ZIP codes^d with Walgreens pharmacies			
2005-2006			
Difference	-0.34	10.43	10.76
Percent change	-0.34	6.99	7.33
2006-2007			
Difference	-6.01	-6.96	-0.95
Percent change	-6.05	-4.36	1.69
2005-2007			
Difference	-6.34	3.47	9.81
Percent change	-6.37	2.33	8.70

^aPer capita indicates that values were divided by the US Census–projected population nationwide for the age cohort for each calendar year.
^bAge in 2007.
^cDifference-in-difference estimates are boldfaced.
^dTo preserve pharmacy anonymity, no individual pharmacies were identifiable, and data were aggregated to geographic areas that included at least 3 pharmacies.

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Kluwer Health from other proprietary datasets. (These other data are from pharmacies that report all transactions. However, these pharmacies likely have higher proportions of pure cash payments than other pharmacies, so these corrected results rely on an upper bound estimate of the extent of pure cash, while our uncorrected results rely on a lower bound estimate.) Comparing the 2 numbers told us by how much we needed to multiply the volume of pure cash observed in our data to make up for the fraction that we were missing. We performed this correction for quantity of days' supply for each age cohort and year. Likewise, we adjusted our estimated effects on overall OOP cost by adding in the missing pure cash observations. In so doing, we assumed that the average prices of missing pure cash transactions were similar to the average prices of the observed pure cash transactions (ie, the missing transactions were missing at random). Unfortunately, age-specific data on mail-order use were not available to implement a similar correction for their under-representation. In the Discussion section we present some evidence that this limitation might not bias our results because the available data suggest that mail order did not change systematically over time.

Comparison With Walgreens Data

Finally, we compared our corrected results with prior estimates of the first-year utilization effect from Walgreens data. Compared with Wolters Kluwer Health Source Lx, Walgreens data have advantages and disadvantages. Walgreens fully reports its pure cash prescriptions, but its disadvantages include the following:

First, Walgreens does not randomly locate its stores, so its records are not likely to be representative of the entire population of US elderly. Although our data contain pharmacies from more than 80% of US counties, Walgreens pharmacies are located only in about 30% of US counties,¹²

■ **Table 2.** Changes in Number of Patients and Out-of-Pocket Costs per Day's Supply in 2005-2007 by Age Cohort

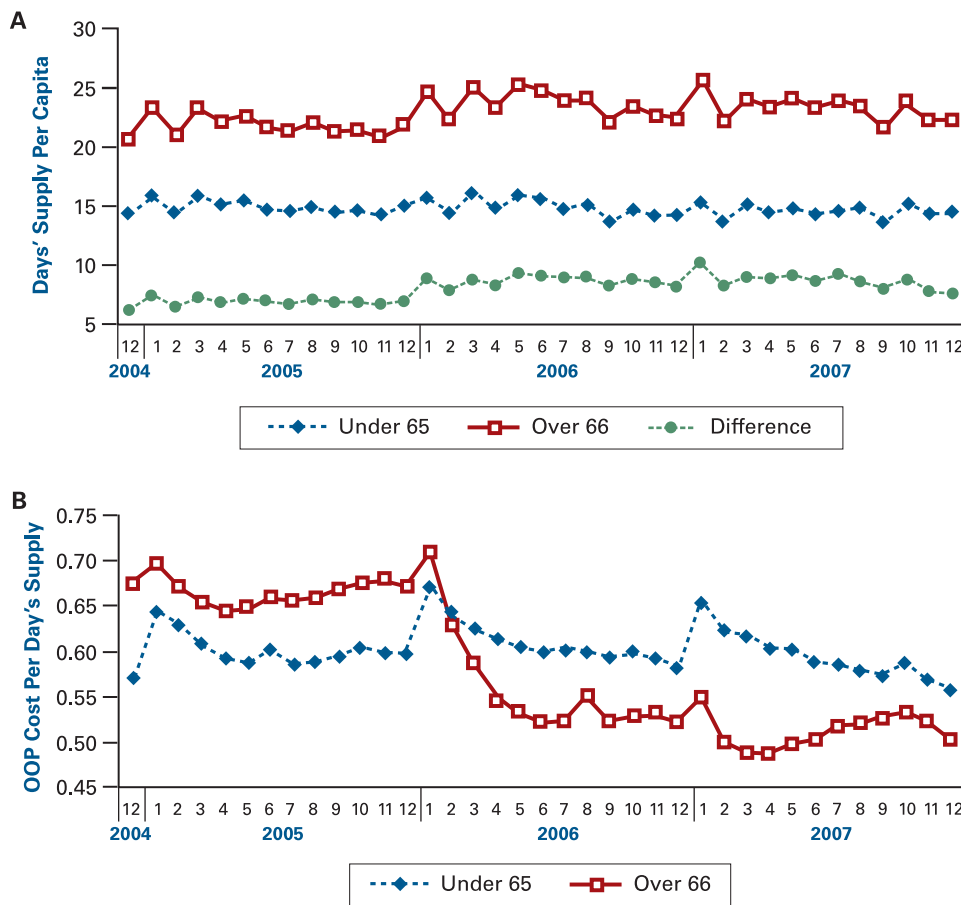
Result	58-64 y ^a	>66 y ^a	Difference ^b
Unique patients filling prescriptions, as a percentage of the total population^c			
2005-2006			
Difference	-0.015	0.001	0.016
Percent change	-4.54	0.25	4.79
2006-2007			
Difference	-0.021	-0.031	-0.010
Percent change	-6.40	-7.80	-1.40
2005-2007			
Difference	-0.036	-0.030	0.007
Percent change	-10.65	-7.56	3.08
Out-of-pocket costs per day's supply, \$			
2005-2006			
Difference	0.008	-0.105	-0.114
Percent change	1.39	-15.85	-17.24
2006-2007			
Difference	-0.015	-0.046	-0.031
Percent change	-2.42	-8.26	-5.84
2005-2007			
Difference	-0.006	-0.152	-0.145
Percent change	-1.06	-22.80	-21.74
^a Age in 2007.			
^b Difference-in-difference estimates are boldfaced.			
^c Total population was determined by US Census projections for each year and age cohort.			

and Part D's effects could have differed in those areas. For example, the results would be an underestimate if the locations of Walgreens are skewed toward areas where the elderly had more generous coverage prior to 2006.

Second, Walgreens implemented marketing efforts to take advantage of Part D's availability and anticipated large increases in their sales to the elderly by attracting customers away from other pharmacies.^{13,14} There also is evidence that the pharmacy benefits management arm, Walgreens Health Services, may have played a role in channeling patients into Walgreens pharmacies.^{15,16} If these activities caused customers to switch from other pharmacies to Walgreens after the implementation of Part D, the existing results would overestimate the general increase in utilization among the elderly due to Part D.

Finally, Part D might have altered the extent to which elderly patients use multiple pharmacies. That could have created unpredictable effects on estimates using only data from Walgreens.

■ **Figure.** Pattern of Changes Over Time^a



OOP indicates out of pocket.

^aDays' supply was normalized by the Census-estimated population for each month and age group, with age defined as of 2007. These absolute values are underestimates because the Wolters Kluwer Health data cover approximately 31% of prescriptions.

We replicated our analysis limiting our sample to just the ZIP codes that include Walgreens pharmacies to understand how the first factor may have affected a comparison between our results and Walgreens results as identified by the National Council for Prescription Drug Programs.¹² To preserve pharmacy anonymity, ZIP codes were aggregated with each other so that each geographic area included at least 3 pharmacies. We also standardized the estimates (by using comparable age groups and time frames) from the 2 existing Walgreens studies to compare with similarly standardized estimates from the Wolters Kluwer Health data.

RESULTS

Table 1 shows descriptive nationwide difference-in-difference results for the total days' supply, reported on a per capita basis to adjust for mortality differences between control and treatment groups. Table 1 estimates were not

adjusted for under-reported pure cash claims. To assess whether the nature of our dataset (ie, the unbalanced pharmacy panel) affected our results, Section A presents the nationwide results, while Section B is restricted to the set of consistently represented retail pharmacies. The results for elderly patients' quantity of days' supply in 2006 show an increase of 8.1% over the 2005 level compared with the change for near-elderly patients. Results from the consistent panel of retail pharmacies in Section B are similar but slightly smaller. The changes from 2006 to 2007 were much smaller; the relative increases in elderly patients' utilization is in the range of 1.0% to 1.4%. Comparing 2007 with 2005, the results indicate that elderly patients' use was 9.0% to 9.6% higher in 2007 than 2005, depending on whether we

use all pharmacies or just the subset of those consistently reporting data to Wolters Kluwer Health.

In **Table 2** we report changes in the number of elderly patients filling any prescription (as a percentage of the population) and elderly patients' average OOP per day's supply relative to that of near-elderly patients. The top half of the table shows that there was a 4.8% relative increase in the number of different elderly individuals filling any prescription in the first year of the program. This increase in the number of prescription recipients is almost two thirds of the magnitude of the increase we observed for days' supply, suggesting that a substantial share of Part D's benefits in its first year accrued at the extensive margin to those previously not filling prescriptions. The observed increase includes both patients who did not use any prescriptions in 2005 but did so in 2006 because the availability of Part D coverage and patients who previously filled only pure cash prescriptions that were not reported in our data. Thus, this result might be

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an overestimate if Part D caused relative reductions in pure cash claims among elderly patients, as indicated by the ancillary data provided by Wolters Kluwer Health. In the second year of the program, we actually saw a small (1.4%) relative reduction in the number of elderly patients filling prescriptions. However, the overall change from 2005-2007 remained above 3%.

The results in the bottom half of Table 2 indicate that between 2005 and 2006, elderly patients' OOP costs decreased both absolutely and relatively (15.9% and 17.2%, respectively), with the implied price elasticity of demand being 0.47. Between 2006 and 2007, the change in OOP prices was an additional 5.8% relative reduction. The change from 2005-2007 implies a price elasticity of -0.44, although the change from 2006-2007 alone suggests an elasticity of only -0.24. This could have happened if, for example, there had been a relative increase in supply-side controls between 2006 and 2007 among drug insurance plans that cover elderly patients.

These results show how changes occurred from one year to the next. To study the pattern of changes over time within the year, we report the total days' supply in **Figure A** and the average OOP cost per day's supply by month for each age cohort in **Figure B**. January was typically the calendar month with the greatest use among elderly patients, resulting in the largest differences between them and near-elderly patients. The difference increased at the onset of Part D and continued to rise through the initial open enrollment period. For the rest of 2006 and 2007, these initial gains were sustained but with little additional increase. In the latter months of both 2006 and 2007, elderly patients' relative utilization decreased somewhat, which is consistent with some entering the donut hole and reducing their purchases. However, this pattern is evident to a lesser degree in 2005 as well. The overall trend in Figure B shows that elderly patients' OOP costs exceeded those of near-elderly patients prior to Part D, but immediately became lower when Part D was implemented and remained lower for

■ **Table 3.** Difference-in-Difference Results Corrected for Under-Represented Pure Cash Prescriptions

Result	58-64 y ^a	>66 y ^a	Difference ^b
Days' supply per capita			
2005-2006			
Difference	-0.463	21.799	22.262
Percent change	-0.24	7.85	8.09
2006-2007			
Difference	7.815	1.678	-6.137
Percent change	4.02	0.56	-3.46
2005-2007			
Difference	7.352	23.476	16.125
Percent change	3.77	8.45	4.68
Out-of-pocket costs per day's supply, \$			
2005-2006			
Difference	0.000	-0.104	-0.104
Percent change	-0.05	-15.60	-15.55
2006-2007			
Difference	0.001	-0.040	-0.041
Percent change	0.14	-7.10	-7.24
2005-2007			
Difference	0.001	-0.144	-0.145
Percent change	0.09	-21.59	-21.68
Total population was determined by US Census projections for each year and age cohort. See Correction for Biases in the Methods section for details regarding how the under-representation of pure cash prescriptions was corrected.			
^a Age in 2007.			
^b Difference-in-difference estimates are boldfaced.			

the rest of our study period. Figure B shows increases in elderly patients' OOP costs for August-November 2006 and for May-October 2007, consistent with the approximate timing of the donut hole. The figure also shows increases in OOP costs early in the year when spending for elderly and near-elderly patients was likely to be under the plan deductible.

In **Table 3** we report the utilization and OOP cost results with the correction for the under-representation of pure cash claims as described in the Methods section. The corrected increase in days' supply is virtually identical to the unadjusted results for 2006 (8.1%) but decreased by 3.5% from 2006-2007. The relative changes in OOP costs were smaller in 2006 (-15.6%) but larger in 2007 (-7.2%), with a reduction from 2005-2007 virtually identical to the uncorrected results (-21.7%). The implied elasticity estimates are -0.52 for 2005-2006 and -0.22 for 2005-2007.

We compared our corrected 2006 utilization results with those from other studies, after we first reconciled the 2 Wal-

■ **Table 4.** Contrasting the 2006 Utilization Results with Prior Estimates from Walgreens Data

Study	Time Frame and Comparison	Difference-in-Difference for Days' Supply		Limitations
		Reported Results (Dates)	Standardized Comparison: Age 60-63 vs Age 66-79 for 2006	
Yin et al ³	September 2004–April 2007 Age 60-63 vs 66-79 in 2006	1.1% (January 2005–May 2006); 5.9% (June 2006–April 2007)	3.9%	Only individuals with 1 or more prescriptions both in 2005 and 2006 at Walgreens pharmacies; mail-order claims were under-represented; no free samples
Lichtenberg and Sun ⁴	September 2004–December 2006 Age 18-64 vs >64 in 2006	12.8% (January–December 2006)	3.7%	Did not account for differences in mortality; Walgreens pharmacies only; mail-order claims were under-represented; no free samples
This study ^a	December 2004–December 2007 Age 58-64 vs >66 in 2007	8.1% (January–December 2006); 9.0% (January–December 2007)	10.0% without correction for under-reported cash, 9.8% with it	Mail-order claims were under-represented; no free samples; adjusted for under-reported pure cash prescriptions

^aOur estimated changes per capita account for differences in the changes in utilization due to differences in mortality across the 2 age cohorts. Our estimates are for patients age 60-63 years vs 66-77 years because Wolters Kluwer Health does not identify exact ages for the oldest patients to preserve their anonymity. Also our baseline time period begins in December rather than September of 2004.

greens studies with each other. **Table 4** presents a summary. Yin et al found a weighted average increase in days' supply after Part D of 4.4% and a weighted average increase for 2006 of 3.9% (assuming the effects were equal across months).³ Lichtenberg and Sun reported a gain in 2006 of 12.8% for patients age ≥64 years compared with those age 18-64 years.⁴ However, using the results for the increases by each age group reported in Figure 4 of Lichtenberg and Sun's working paper,¹⁷ and weighting by the US population in each age group,¹⁰ we estimate that they would have found an increase of 3.7% if they conducted the comparison implemented by Yin et al. Thus, an important observation is that the 2 Walgreens results are virtually identical once the comparison is standardized, despite different empirical methods.

We could not generate perfectly comparable results from our data because they began in December rather than September of 2004 and because Wolters Kluwer Health does not identify specific ages of the oldest patients to preserve their anonymity. Thus, we generated the difference-in-difference comparison of the changes among those age 60-63 years versus those age 66-77 years in 2006 from the pre-Part D time period of December 2004 through December 2005 to all of 2006. As before, we adjusted for changes in population size and report utilization per capita. This exercise yielded a relative increase of 10.0% when not

adjusting for under-reported pure cash prescriptions and 9.8% when the adjustment was made. These utilization estimates are 2.6 times larger than the increase estimated from Walgreens data.

As an additional comparison, in Table 1, Section C, we report changes from the Wolters Kluwer Health data in ZIP codes containing Walgreens pharmacies. The results are smaller than our nationwide results. These results suggest that the estimates from Walgreens data could be smaller than our results because of the location of Walgreens stores.

DISCUSSION

After the implementation of Medicare Part D in January 2006, elderly patients' prescription drug utilization increased and OOP costs decreased substantially compared with the utilization and costs of near-elderly patients. Studying 2005-2007 data without adjusting for the under-reporting of pure cash prescriptions, we found that there was a 21.7% relative decrease in OOP costs, whereas there was a 9.0% relative increase in utilization. A large majority of these changes occurred from 2005 to 2006. Because the number of elderly patients filling prescriptions also grew during this time, these effects appear to have resulted from increased access by both newly insured and previously covered patients.

Adjusting for the under-reporting of pure cash prescriptions yielded very similar results, with the only notable difference occurring for the changes in 2006 and 2007. That is likely due to changes in the pricing of generics at the pharmacies that reported all of their pure cash claims to Wolters Kluwer Health.

Our estimated increases in days' supply for 2005-2006 are 2.6 times larger than the most comparable results using Walgreens-only data. This is somewhat surprising given Walgreens reported intentions to grow their Part D sales by attracting elderly patients from other pharmacies. The differences might result from limitations in either data source, the slight differences in the comparisons performed (age groups and time periods, or our inclusion of other types of pharmacies), or methods (eg, Lichtenberg and Sun's lack of adjustments for mortality rate differences,⁴ and the restriction by Yin et al to patients filling prescriptions at Walgreens in both years³).

Both datasets share several notable shortcomings. Both under-represent mail-order pharmacies, which could have caused underestimates of the impact of Part D if Part D increased elderly patients' use of mail-order pharmacies relative to use by near-elderly patients. Both also excluded free samples, which would have caused overestimates of the impact of Part D on actual procurement of prescription drugs if free samples were crowded out by Part D. Although there are no studies that estimate how much mail-order or free-sample volumes have changed over the last few years for elderly patients specifically, the overall trends in both measures suggest that neither of these biased our estimates much. The share of days' supply filled via mail order by patients of all ages increased minimally, from 13.5% in 2005 to 13.8% in 2007.¹¹ Similarly, Verispan data indicate that free samples increased by 4% in both 2006 and 2007, well above the increases of 1% from 2003-2004 and 2% from 2004-2005.¹⁸

CONCLUSION

Our results capture Part D's net, aggregate effects on elderly patients, regardless of whether they took up the new coverage or not. Understanding these effects is important for understanding the efficiency of government expenditures on Part D. Part D also could have important implications for equity, given the pre-existing disparities in access to medical care under Medicare and the specific policy goal of improving access among patients with lower socioeconomic status.¹⁹⁻²¹

Part D has other potential benefits and costs that we have not attempted to measure in this article. These include spill-

Take-away Points

Using near-elderly patients as a control group, we concluded that Medicare Part D:

- Decreased elderly patients' relative out-of-pocket costs for prescription drugs substantially in both 2006 and 2007.
- Increased their relative utilization of prescription drugs substantially from 2005 to 2006 but not from 2006 to 2007.
- These 2006 utilization estimates are 2.6 times larger than comparable results from previous studies using different data.

overs of higher quantity or quality prescription drug use to expenditures for other types of medical care,^{22,23} enhanced well-being of elderly patients due to the insurance value of prescription drug coverage, altered drug prices paid by other US consumers, and changed incentives to produce new drugs.^{24,25} All of these potential net benefits must be weighed against the OOP costs and the opportunity cost of the taxpayer's bill for Part D to determine the economic efficiency of this new government program.

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