

How Do Medicare Advantage Beneficiary Payments Vary With Tenure?

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The option to choose a private health insurance plan has existed for Medicare beneficiaries for several decades. More than 17 million beneficiaries (31%) were enrolled in Medicare Advantage (MA) plans in 2016—up from 6.8 million a decade earlier—and beneficiaries had an average of 19 plan choices in that year.^{1,2} When choosing a plan, beneficiaries face a variety of tradeoffs, including premiums versus expected out-of-pocket medical costs (OOPC), which have important consequences given the lower incomes and higher average medical spending of Medicare beneficiaries compared with the broader US population. Understanding how beneficiaries choose among their plan offerings and the consequences of those choices is important for both beneficiary well-being and the competitiveness of the MA market.

We sought to address several questions related to plan choice in the MA market. Compared with other plans available to beneficiaries, how much are they currently spending on premiums and cost sharing? How do plan costs compare for beneficiaries who have been enrolled in the same plan for different periods of time? Compared with lower-cost options available to beneficiaries, what is the dollar value of the foregone savings—if any—from remaining in the same plan over time?

When choosing an MA plan, there are a variety of plan features for beneficiaries to consider: 1) the premium—if any—to enroll in the plan, including premiums for Part D (prescription drug) coverage and any reductions to the standard Part B (physician and outpatient) premium; 2) coverage of services supplementing the traditional Medicare benefit (eg, dental or vision coverage); 3) which medical providers are in-network; 4) plan quality; 5) utilization management practices; and 6) cost-sharing features and anticipated spending on OOPC. Most beneficiaries have a fairly wide choice of MA plans, including both health maintenance organization (HMO) and preferred provider organization (PPO) offerings.²

Although research shows consumers have difficulty selecting health insurance plans,³ the MA plan choice environment may be particularly confusing for consumers.⁴ First, Medicare

ABSTRACT

OBJECTIVES: To compare how premiums and expected out-of-pocket medical costs (OOPC) vary with the length of time Medicare Advantage (MA) beneficiaries have been enrolled in their plans.

STUDY DESIGN: Descriptive and fixed effects regression analyses.

METHODS: Using linked administrative enrollment and plan data, we compared the costs of the MA plans that beneficiaries chose with the costs of other plans available to them. We show predicted values adjusted for age, gender, race/ethnicity, disability, individual health risk, presence of mental health diagnoses, health plan quality, relative size of the plan's provider network, and the number of years continuously enrolled in the same plan. To further address the possibility of bias, we included county-level fixed effects and compared results to a beneficiary-level fixed effects model.

RESULTS: We found average spending on premiums and OOPC in enrolled plans exceeded such costs in the lowest-cost plan by \$697 in 2013. Beneficiaries who remained in their plans for 6 or more years were most at risk of spending these higher amounts, paying \$786 more than they would have spent in the lowest-cost plan compared with \$552 for beneficiaries in their first year of enrollment. For each year a beneficiary remained in their same plan, their additional spending in excess of the minimum cost choice increased by roughly \$50.

CONCLUSIONS: MA beneficiaries could reduce their exposure to healthcare spending by switching to plans with lower premiums, although there may well be rational reasons for paying costs in excess of those of the lowest-cost plan.

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beneficiaries, who are more likely to have cognitive limitations, can have difficulty assessing the various tradeoffs involved in deciding on a health plan.^{5,6} Second, because premiums are often used as an indication of quality and, in most counties, beneficiaries have access to multiple MA plans without an enrollee premium (aside from the Part B premium), they have to consider other attributes (eg, provider networks, cost sharing covered benefits) that are more difficult to understand and compare.⁷ Third, many beneficiaries pay premiums through withholdings from their Social Security benefits, which may discourage beneficiaries from actively considering their choices even when premiums increase. Finally, as in other markets, beneficiaries who do not actively switch plans between years are automatically reenrolled in the same plan, potentially creating a bias toward their previously chosen option.⁸

Although several previous studies have investigated decision making in the MA market, few have looked specifically at what beneficiaries pay for coverage and how that compares with other options. For example, one recent study found that MA enrollees were more likely to choose plans that reduced cost sharing than those that kept premiums low, but it did not quantify differences in plan costs or how those values changed when beneficiaries were enrolled in their same plan for longer periods of time.⁹ Studies have examined the appropriateness of beneficiary choices of standalone Medicare prescription drug plans. Among other things, this research has tried to assess whether beneficiaries are subject to inertia in their plan selections with some disagreement about the extent of the problem and how it has evolved.^{10,11} Comparatively little attention has been paid to these concepts in the market for MA plans, and few studies have investigated the financial impact of the plans MA beneficiaries chose.

METHODS

Our analysis relied on a unique link between several administrative databases that CMS collects. Our key results were derived from a 2% random sample of the Medicare Beneficiary Summary File enrollment databases for 2013, although we also used historical data on beneficiary plan selections from as early as 2006 to measure tenure in MA plans.¹² Additional details about the data are provided in the [eAppendix](#) (eAppendices available at www.ajmc.com).

We excluded beneficiaries who were not enrolled in both Part A and B of Medicare in January of each year, did not choose an MA plan with Part D coverage (MA-PD plans), were enrolled in a Special Needs Plan (SNP) or an employer plan, or were enrolled in Medicaid or the Part D Low-Income Subsidy program. From each beneficiary's set of MA plan choices, we excluded SNPs, plans

TAKEAWAY POINTS

Our results suggest that beneficiaries may not be actively and regularly comparing plans, and thus are subject to a certain amount of inertia in their plan selections.

- ▶ On average, beneficiaries who have been enrolled in their plans for longer periods of time paid more for their plan compared with the lowest-cost option available to them.
- ▶ Medicare Advantage beneficiaries could reduce their exposure to healthcare spending by switching to plans with lower premiums.
- ▶ Changes to the Medicare choice environment that increase the salience of premiums or encourage beneficiaries to compare plans could reduce passive reenrollment and stimulate a more robust competitive environment for insurers.

that were not an MA-PD, and employer-sponsored plans. Our final sample included 93,519 beneficiaries in 2013. All comparisons in the text are significant at the 0.1% level unless otherwise noted. Nominal dollar values are adjusted to 2013 US dollars using the Bureau of Labor Statistics' Consumer Price Index US city average.

We compared each beneficiary's choice of an MA-PD plan on 2 observable dimensions. First, we considered the total premium to enroll in the plan, including the Part B premium, any amounts the MA plan charges, and any premiums for Part D coverage. (Because Part B premiums can vary by income, we included the most common amount for a beneficiary with <\$80,000 in income. Our measure incorporates any reductions to the Part B premium offered through MA plan rebates.)

Second, we analyzed expected OOPC, which is a CMS-derived actuarial estimate of average beneficiary spending for cost sharing for health services using a standardized sample of representative beneficiaries.¹³ CMS calculates OOPC values for each plan by mapping its cost-sharing features to the actual utilization patterns of the sample of beneficiaries. Five values of OOPC are calculated depending on a beneficiary's self-reported health, and we imputed an average of these 5 values based on the probability that the beneficiary is in each of those health states. (The [eAppendix](#) provides more detail on the OOPC measure. [eAppendix Table 1](#) shows that our descriptive results lie between the extremes of assuming all individuals are either in "excellent" or "good" self-reported health. Additionally, our main results in [eAppendix Tables 2](#) and [3](#) are not sensitive to alternative imputation procedures, as shown in [eAppendix Tables 4](#) and [5](#).)

CMS lists OOPC on the Medicare plan finder website, providing a prospective metric of spending in a plan that is potentially salient at the time of enrollment.¹⁴ Given that MA plans often use federal payments to cover services outside the fee-for-service (FFS) benefits package, OOPC is useful for identifying both variation in the breadth of coverage and differences in cost sharing between plans.

Our descriptive findings in the [Table](#) show enrollee premiums and OOPC for the plans beneficiaries chose and compare them to other plans they could have chosen. We compared the values for each beneficiary's chosen plan with the values for: 1) the plan with the lowest enrollee premium, 2) the plan with the lowest OOPC, and

TABLE. Premiums and Expected Out-of-Pocket Costs for Medicare Advantage Plans With Part D Coverage, 2013^a

	Total Enrollee Premiums ^b	Expected OOPC ^c	Premiums + OOPC (col 1 + col 2)	Premiums + OOPC Compared With Enrolled Plan
Plan in which beneficiary is enrolled	1667	2078	3745	N/A
Comparison plans ^d				
Lowest total premium	1032	2264	3296	-448
Lowest expected OOPC	2331	1525	3856	112
MESP plan (min value for premium + OOPC) ^e	1141	1907	3048	-697
Comparison plans among plans of same coverage type ^d				
Lowest total premium	1115	2256	3371	-374
Lowest expected OOPC	2250	1625	3874	130
MESP plan (min value for premium + OOPC) ^e	1219	1978	3197	-548
Enrolled plan for beneficiaries with >1 choice from their insurer ^f	1793	2016	3808	N/A
Comparison plans among plans of same insurer and coverage type ^d				
Lowest total premium	1309	2260	3570	-239
Lowest expected OOPC	2343	1780	4122	314
MESP plan (min value for premium + OOPC) ^e	1381	2141	3522	-287

Col indicates column; MESP, minimum expected spending plan; min, minimum; N/A, not applicable; OOPC, expected out-of-pocket medical costs.

^aAuthors' calculations of data from CMS. Amounts rounded to the nearest whole dollar. Sample includes MA beneficiaries enrolled in MA-PD plans (those with Part D coverage) and not enrolled in special needs or employer-sponsored plans.

^bTotal enrollee premiums include the standard Part B premium, any additional Medicare Advantage (MA) plan premium for Part A and Part B benefits, and any premium for Part D coverage. Any reductions to enrollee premiums from MA plan rebates are incorporated in these amounts.

^cExpected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries, including for services or goods not covered by Medicare.

^dAll amounts shown for comparison plans are statistically different from the average amounts for beneficiaries' chosen plans at $P < .001$.

^eMESP is the plan that, on average, would have the lowest combined total premium and OOPC.

^fSample for comparisons to plans offered by current insurer excludes individuals with only 1 plan choice from their current insurer.

3) the minimum expected spending plan (MESP), or the plan with the lowest combined premiums plus OOPC. We also compared values for their chosen plan with the values for alternative choices within the same type of coverage, including HMO, PPO, and private FFS plans. Finally, we compared spending for a beneficiary's plan to spending in alternative plans of the same type (HMO, PPO, private FFS, other) offered by the beneficiary's current insurer. Although this comparison highlights how switching can reduce spending potentially without changing one's provider network, it implicitly assumes beneficiaries would not switch insurers or plan types to save, and thus, could be considered an underestimate of foregone savings.

We assessed whether beneficiaries who remain in the same plan for longer periods of time pay larger premiums or receive less in expected benefits compared with those who switch plans. First, we compared the payments for beneficiaries who either newly enrolled in an MA plan in 2013 ("new enrollees") or who switched plans between 2012 and 2013 ("switchers") against those who remained in the same plan ("stayers"). Second, we examined payments by length of continuous enrollment in the same plan. For all regression results, we reported predicted differences in expected spending between the chosen plan and the MESP.

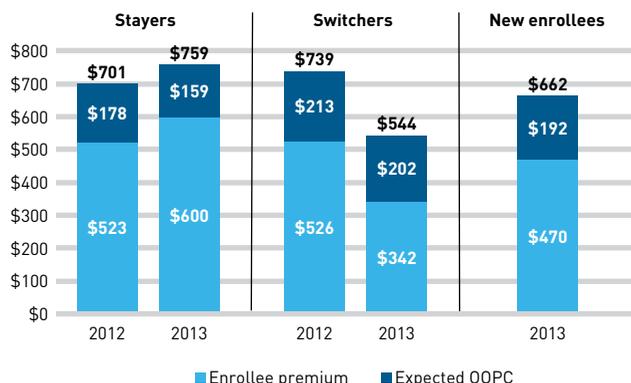
Using ordinary least squares models, we regressed differences in the cost of the chosen plan compared with the MESP on an

identifier for switchers (Figure 1) or the number of years continuously enrolled in a plan (Figure 2). We controlled for a wide variety of individual characteristics that may be related to the decision to switch plans, including age, gender, race/ethnicity, individual-level health risk (using the CMS-derived Hierarchical Condition Category [HCC] risk score), and presence of mental health diagnoses. We also included indicator variables for the chosen MA plan's star rating and provider network size compared with both the MESP and the median plan in the beneficiary's county. The models included county-level fixed effects to control for unobserved aspects of the local MA market, such as geographic cost variation or the types of plans offered.

We limited our regression analyses to beneficiaries enrolled in Medicare for 6 or more years because newer beneficiaries may exhibit different underlying plan choice behavior, including frequent switching, as they learn about the market. We chose 6 years to reduce the likelihood that our key independent variable (ie, tenure in an MA plan, which has a maximum of 6 years) would be polluted by unobserved differences between new enrollees and older cohorts. (Our results were not sensitive to this specification.)

Because a spurious correlation could exist between beneficiary preferences for health plans and length of time enrolled in a plan, we compared our regression results to individual-level fixed effects models. This approach removed the effects of time-invariant

FIGURE 1. Differences Between Chosen MA Plan's Costs and the MESP, by Beneficiary Plan Switching Status in 2013^{a-f}



MA indicates Medicare Advantage; MESP, minimum expected spending plan; OOPC, out-of-pocket medical costs.

^aAuthors' calculations of data from HHS and CMS.

^bAmounts rounded to the nearest whole dollar.

^cEnrollee premiums include the standard Part B premium, any additional MA plan premium for Part A and Part B benefits, and any premium for Part D coverage. Any reductions to enrollee premiums from MA plan rebates are incorporated in these amounts. Expected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries, including for services or goods not covered by Medicare. Plan with minimum expected spending would, on average, have the lowest combined enrollee premium and OOPC.

^dSample includes MA beneficiaries enrolled in MA-PD plans (those with Part D coverage) and not enrolled in special needs or employer-sponsored plans. Comparison plans include plans offered in the beneficiary's county, excluding plans without Part D coverage, special needs plans, and employer plans.

^eAmounts shown are predicted values from 4 regressions (premium and OOPC each in 2012 and 2013) where the plan characteristic displayed is the dependent variable. Independent variables include: age, gender, race, original reason for entitlement, beneficiary's Hierarchical Condition Code risk score, an identifier for any mental health diagnoses, identifiers for plan star rating and size of the provider network relative to the MESP plan and the median plan in the beneficiary's county, and county-level fixed effects. Identifiers for whether a beneficiary switched plans from 2012 to 2013 or was a new enrollee in 2013 are used to vary the predictions.

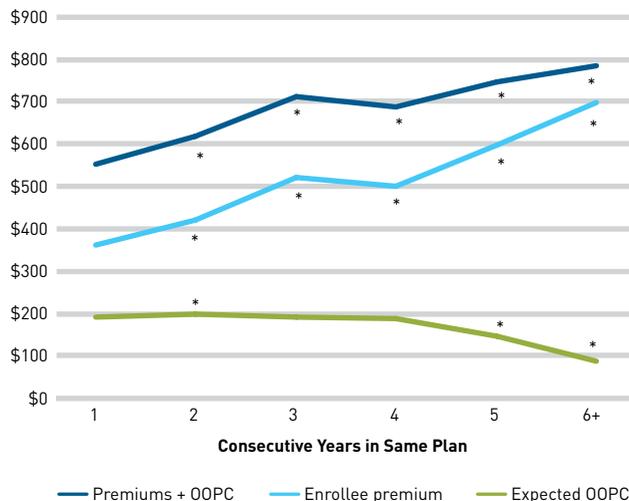
^fChange in premiums and total costs from 2012 to 2013 among switchers is statistically different from the change for stayers at $P < .001$; premiums and OOPC in 2013 for new enrollees were statistically different than those for stayers at $P < .001$.

preferences, such as risk aversion or taste for utilization management. As shown in eAppendix Tables 6 and 7, our results were insensitive to this alternative specification.

RESULTS

As shown in the Table, in 2013, average spending for MA beneficiaries was \$1667 for premiums and \$2078 in OOPC. On average, choosing the plan with the lowest premium would have reduced spending on premiums by 38% or \$635 (from \$1667 to \$1032), and combined spending on premiums and OOPC would have been 12%, or \$448, lower because higher OOPC offset lower premiums. Combined expenditures would have been 3%, or \$112, higher in the plan with the lowest OOPC because of the higher premium

FIGURE 2. Difference Between Expected Spending in Plan MESP, by Years Enrolled in Same Plan, 2013^{a-e}



MESP indicates minimum expected spending plan; OOPC, out-of-pocket medical costs. "*" indicates significance at 0.1% level compared with the value for beneficiaries enrolled in their plan for 1 year.

^aAuthors' calculations of data from HHS and CMS.

^bEnrollee premiums include the standard Part B premium, any additional Medicare Advantage (MA) plan premium for Part A and Part B benefits, and any premium for Part D coverage. Any reductions to enrollee premiums from MA plan rebates are incorporated in these amounts. Expected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries, including for services or goods not covered by Medicare.

^cComparison plans include plans offered in the beneficiary's county, excluding plans without Part D coverage, special needs plans, and employer plans.

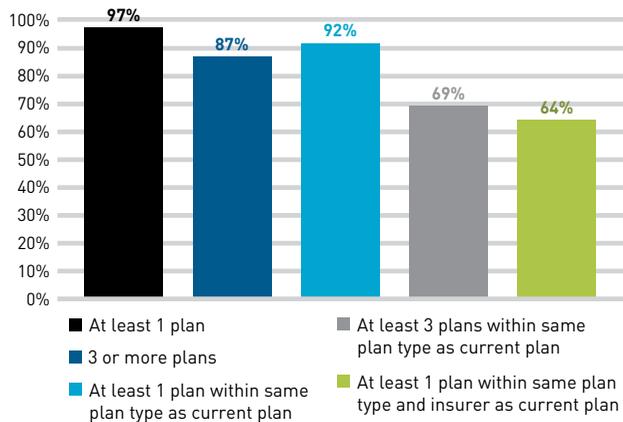
^dSample includes MA beneficiaries enrolled in MA-PD plans (those with Part D coverage), not enrolled in special needs or employer-sponsored plans, and enrolled in Medicare for 6 or more years.

^eAmounts shown are predicted values from 3 regressions where the 3 plan characteristics displayed are the dependent variables. Independent variables include: age, gender, race, original reason for entitlement, beneficiary's Hierarchical Condition Code risk score, an identifier for any mental health diagnoses, identifiers for plan star rating and size of the provider network relative to the MESP plan and relative to the median plan in the beneficiary's county, county-level fixed effects, and number of years continuously enrolled in the same plan that is used to vary the predictions.

for that plan. By definition, the MESP had the lowest combined premium and OOPC, which was 19%, or \$697, lower than the costs beneficiaries paid on average in 2013.

We also compared beneficiary payments with the lowest premium and lowest OOPC plans of the same plan type as that which the beneficiary chose. The Table shows that beneficiaries could have selected the same type of plan and reduced their premium by 33%, or \$552, (from \$1667 to \$1115) by selecting the plan with the lowest premium. Beneficiaries could have switched to the MESP among plans of the same type in 2013 and paid 15%, or \$548, less on premiums plus expected cost sharing than they actually did. Among those with more than 1 plan available from their current insurer, they could have switched plans without switching insurers or their type of plan and reduced total costs by 8%, or \$287.

FIGURE 3. Percentage of MA Enrollees That Could Enroll in Plans With Lower Combined Enrollee Premiums and Expected OOPC, 2013^{a-e}



MA indicates Medicare Advantage; OOPC, expected out-of-pocket medical costs.

^aAuthors' calculations of data from HHS and CMS.

^bEnrollee premiums include the standard Part B premium, any additional Medicare Advantage (MA) plan premium for Part A and Part B benefits, and any premium for Part D coverage. Any reductions to enrollee premiums from MA plan rebates are incorporated in these amounts.

^cExpected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries, including for services or goods not covered by Medicare.

^dComparison plans include plans offered in the beneficiary's county, excluding plans without Part D coverage, special needs plans, and employer plans.

^eSample includes MA beneficiaries enrolled in MA-PD plans (those with Part D coverage), not enrolled in special needs or employer-sponsored plans, and those with access to 4 or more eligible plan choices in 2013. This latter criterion excludes 16% of beneficiaries in the sample who had access to 3 or fewer plans in 2013. Sample for comparisons to plans offered by current insurer excludes individuals with only 1 plan choice from their current insurer (46% of beneficiaries in 2013).

Figure 3 shows that in 2013, 97% of MA beneficiaries had at least 1 plan available to them that would have lowered their total expected spending and about 87% had 3 or more plans. Additionally, 92% of beneficiaries had at least 1 plan of the same type with lower expected spending and 69% had at least 3 plans. Finally, 64% could have found a cheaper plan without switching their plan type or their insurer.

Figure 1 compares spending, adjusted for observable differences, for switchers and stayers between 2012 and 2013, and for new enrollees in 2013. Switchers, on average, narrowed the difference between the premium paid and the premium of the MESP (from \$526 to \$342), whereas stayers saw an increase (from \$523 to \$600). Although stayers and switchers reduced differences in OOPC, switchers reduced the difference in total costs by \$195 (\$739 in 2012 and \$544 in 2013) compared with an increase of \$58 (from \$701 to \$759) for stayers. Enrollees newly choosing an MA plan for the first time in 2013 spent \$130 less on premiums than stayers and \$96 less overall.

Figure 2 shows that the difference between expected spending in a beneficiary's chosen plan compared with the MESP grew with the number of years continuously enrolled in the same plan. Whereas comparable beneficiaries who have been enrolled for

longer periods do not seem to have larger expected OOPC, and that amount may even fall somewhat, they pay more for premiums with increasing tenure. Beneficiaries in their first year in a plan pay \$552 more than the amount they would pay in the cheapest available plan for both premiums and cost sharing, whereas comparable beneficiaries with 6 or more years pay \$786 more than the minimum plan. Increases in premiums charged for Parts A and B benefits primarily caused these differences rather than changes in OOPC or Part D premiums (not shown). For each year a beneficiary remains in their same plan, their additional spending in excess of the minimum cost choice increases by roughly \$50.

DISCUSSION

Our findings across a range of models show that MA beneficiaries spend substantially more for premiums and expected OOPC than the lowest-cost plan in their area and the total amount increases as enrollees stay in their plan. The average amount in excess of the MESP of \$697 constitutes more than 2 percentage points of the median income for MA beneficiaries in 2014 (\$26,000). (Estimates were derived from the authors' calculations of MA beneficiaries' income using CMS administrative databases and survey data.) Because about half of MA beneficiaries remain in their plan over a given 5-year period, these annual amounts understate the total amount most beneficiaries could save over their average duration in a plan.

As tenure increased from 1 to 6 or more years, beneficiaries paid \$339 more in premiums (\$699 minus \$361) compared with available lower-cost plans with only a \$104 reduction in OOPC (\$87 instead of \$191). Plan networks and covered services do not typically change much from one year to the next, so it would be reasonable to expect increases in premiums in excess of lower-cost plans to be offset roughly in parallel by lower cost sharing. This finding suggests that many beneficiaries, and particularly those who have remained in their plan for several years, would benefit financially from switching to lower-premium plans.

The average amount by which beneficiaries spend more than they would if enrolled in the lowest-cost plan in their area is largely a result of their chosen plan's premium rather than its OOPC. This may arise because CMS limits the annual amount by which plans can increase OOPC, which may cause plans to increase premiums instead. Nevertheless, our results are consistent with research suggesting that Medicare beneficiaries are generally inattentive to increases in plan premiums after their initial enrollment decision.¹⁵

Limitations

Although we controlled for a variety of demographic and health-related characteristics, we cannot draw firm conclusions regarding the appropriateness of beneficiaries' choices because there may be unobserved components of beneficiary demand for plans. Beneficiaries who remain in the same plan may become

accustomed to the features of their plan and be willing to pay to stay. Recognizing this limitation, we: 1) compared beneficiary spending within type of plan and against other plans offered by their current insurer, 2) controlled for expected healthcare utilization using the CMS-assigned HCC risk score, and 3) used an individual-level fixed effect model. Our multivariate results did not appreciably change under any of these specifications.

The absence of MA claims data prevents us from developing comparisons of what beneficiaries would have actually spent on cost sharing had they chosen differently. Healthcare needs differ greatly, and some beneficiaries may have chosen plans that reduced their own exposure to medical costs (eg, richer coverage for anticipated stays in skilled nursing facilities), even though they appeared to pay more for premiums or OOPC. Nevertheless, the CMS OOPC measure is advantageous because it provides the actual information regarding ex ante financial risk that the beneficiary had when choosing a plan.

Due to CMS regulations requiring plans to develop provider networks as of 2011, many private FFS plans exited the market around that time. Some beneficiaries in our sample may have been exposed to this policy change and chose new plans. Because individuals who switch would have shorter tenure, thus leading to lower payments on average, this would imply our estimates are lower bounds of the long-term effect of tenure on payments in excess of the MESP.

Implications

There are several implications of beneficiaries paying more for premiums rather than OOPC relative to the lowest-cost plan available to them. First, MA beneficiaries could reduce their exposure to healthcare spending by switching to plans with lower premiums, although there may well be rational reasons for paying these costs, which we cannot observe.

Second, our results are consistent with a plan choice environment where beneficiaries are passively reenrolling in their MA plans from one year to the next. In such a marketplace, it would be logical for MA insurers to attempt to either increase premiums or beneficiary cost sharing in the hopes that they could profit from inertial consumers, and we find some evidence that premiums increase the longer beneficiaries remain in their plans.

CONCLUSIONS

We found that the amount of money “left on the table” increases with length of enrollment in a plan, suggesting that beneficiaries may not be actively and regularly comparing plans, and thus, are subject to a certain amount of inertia in their plan selections. One potential consequence is a diminished incentive for insurers to compete for enrollees by reducing premiums and tailoring benefits to consumer preferences. Changes to the current Medicare choice

environment that increase the salience of premiums or encourage beneficiaries to compare plans more actively could reduce the number who passively reenroll in their plans and stimulate a more robust competitive environment for insurers. ■

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eAppendix

This appendix provides additional details about the data and methods used to produce the results in the paper and supplementary analyses and results not shown in the text. The appendix is divided into 3 parts: 1) a description of the databases used; 2) additional details regarding specific methodological choices; and 3) supplementary results.

Data

All of the results of this paper relied on a combination of beneficiary- and plan-level administrative databases that the Center for Medicare and Medicaid Services (CMS) produces. These combined files provide nationally-representative data on the characteristics of Medicare Advantage (MA) enrollees, the plan in which they were enrolled, and on the other plans available in their county. These data allow us to observe beneficiary choices, including switching between plans, over time.

The analytical file we used for this paper combines the following databases:

1. Medicare Beneficiary Summary File (MBSF), 2001-2013

The MBSFs contain records for all Medicare enrollees in each year, and have basic demographic information, including age, sex, race, county of residence, reasons for Medicare eligibility, and whether the beneficiary was enrolled in MA in each month.¹

Our analysis used a 2% random sample of enrollees in the MBSFs, beginning with anyone enrolled in Medicare in December 2001, and adding a 2% random sample of anyone who newly enrolled in Medicare by December of each subsequent year. (We refer to this dataset in this appendix as the “MBSF 2% Denominator.”) Any beneficiaries not enrolled in Medicare Advantage (MA) in that year or not covered by both Part A and B benefits for the entire year were excluded from our sample.

2. Medicare Part D Intermediate Denominator Files (Part D Denominator), 2006-2013

The Part D denominator files contain data on enrollment in any MA plan, irrespective of whether the plan offers Part D benefits or not. From the 2006 to 2013 Part D denominator files, we merged the MA carrier and plan identifier for beneficiaries enrolled in MA plans to the MBSF 2% Denominator.

3. Risk Adjustment Processing System (RAPS), 2010-2013

Each year CMS generates relative risk scores to adjust payments to MA plans for health risk using a model known as the hierarchical condition category (HCC) model.² Each beneficiary is assigned both community-based and institutionalized risk scores, which are found in the RAPS database. We matched each beneficiary in the MBSF 2% Denominator with their community-based risk score for the particular year. We used the HCC community-based risk score for each year as a proxy for expected healthcare spending in the multivariate models use in the paper. This measure is also used to impute expected out-of-pocket medical costs at the beneficiary level (as detailed below).

4. Medicare Advantage Bid Pricing Tool (BPT), 2010-2013

Each year, MA plans participating in a region are required to submit to CMS an actuarial justification for the plan's bid, any enrollee premiums, and covered benefits; CMS combines these data into the BPT. We matched actuarial information for each plan the beneficiary had available to him/her based on their county of residence. These data include plan-specific information on the types of benefits offered, the estimated cost of rebated benefits, any enrollee premiums charged, and the type of plan (eg, HMO, PPO, private FFS). These data also include each MA insurer's projection of enrollment for each plan.

5. Medicare Plan Finder (MPF) Out-of-Pocket Cost Estimates, 2010-2013

CMS produces estimates of how much beneficiaries can expect to pay in premiums and out-of-pocket costs for medical services (OOPC) if they enroll in a particular MA plan.³ This information is available on the MPF website so that beneficiaries may make an informed choice about their expected spending in a plan.⁴ We matched each MA enrollee's plan choice for plan years 2010 to 2013 to CMS' estimate of enrollee premiums and expected OOPC. To generate these estimates, CMS used the Medicare Current Beneficiary Survey and plan cost-sharing information to estimate enrollee premiums and OOPC for each of 5 self-reported health states for each MA plan. These measures include spending on Medicare-covered benefits as well as services outside of the FFS benefit package (eg, dental, vision, emergency transportation). By including

expected spending on both FFS-covered and supplementary benefits, these data allow a more accurate comparison of beneficiary costs across plans.

Because CMS provides OOPC for medical services by a beneficiary's self-reported health and because self-reported health is not a measure included in administrative data, we assigned each beneficiary 5 probabilities—1 for each of the 5 estimated OOPC levels for each MA plan. We conducted this imputation using their community-based HCC risk score reported in the RAPS database as a proxy for health status. To impute expected OOPC, we estimated the probability of a beneficiary being in each of those 5 health states based on their HCC risk score. First, using the MCBS and an ordered probit model, we estimated the relationship between a person's self-reported health status and her community-based HCC risk score. Using coefficients from that model and community-based risk scores found in the RAPS data for each year, we calculated the probability that individuals in our administrative data were in each of the 5 health states. We then generated 5 observations for each person, each one containing a probability of being in each health state. Next, we calculated the OOPC for a beneficiary's chosen plan and other plans available in her county given that health state, and use the estimated probabilities of each health state as weights in our analysis.

Our imputation strategy assumed that the HCC measure is a good predictor of self-reported health status and that beneficiaries' subjective views about their health influences their choice of MA plans. Given the potential importance of this assumption, we generated alternative versions of our results that did not rely on this regression-based matching of health status and HCC. Instead, in a first alternative, we assumed that all beneficiaries reported "good" health and, in a second alternative, that all beneficiaries reported "excellent" health. These versions can be found in eAppendix Table 1. Because the results in the main text are driven mostly by differences in amounts spent on enrollee premiums, these alternatives did not substantially change our key findings or conclusions. And, in fact, none of these 3 versions differs greatly with respect to how much beneficiaries spend in excess of the minimum expected spending plan in their county.

6. CMS Part C&D Plan Crosswalk (Crosswalk Files)

CMS provides Crosswalk Files that track each MA plan's status between years, including whether a plan that was present in one year is terminated in a subsequent year, or whether the plan changes its provider network or service area between years.⁵ Using these data, we tracked whether a beneficiary, who was enrolled in MA in one year, remained in the same plan or voluntarily switched to a new plan in a subsequent year. In our analysis of beneficiary switching and tenure in a plan, we excluded any plan switching resulting from a plan termination, and included only voluntary switches initiated by the beneficiary. For example, we also excluded switching behavior due to plans that had significant network changes compared with the previous year.

Methods

Using the data described above on MA plans' enrollment, enrollee premiums, rebated benefits, and expected OOPC, we calculated county-specific values for plans in each MA market. These included:

1. the plan with the lowest beneficiary premium;
2. the plan with the lowest expected OOPC; and
3. the minimum expected spending plan (MESP), which is the plan with the lowest combined amount for total premiums plus expected OOPC.

We merged the plan characteristics (enrollee premiums and expected OOPC) for these 3 plans to each beneficiary by county of residence, which allowed us to make comparisons to the beneficiary's chosen plan. We also calculated county-specific summaries of the MA market by plan type (eg, HMO, PPO, private FFS). For this analysis, we compared each MA beneficiary's plan to all the other plans of the same type offered in their county of residence. Finally, for beneficiaries with more than 1 choice of plan offered by their current insurer, we compared their chosen plans' values to those of the other plans of the same type (HMO/PPO/FFS/other) offered by their same insurer.

For all of our results, we excluded any MA beneficiaries enrolled in employer-sponsored or special needs plans (SNP) from the estimating sample. These beneficiaries typically have a limited choice of MA plans, and thus their willingness or ability to switch plans between years is diminished compared with the typical beneficiary.⁶ We also excluded beneficiaries enrolled in Medicaid and or the Part D Low-Income Subsidy (LIS) program, which subsidizes the costs of

prescription drug coverage. Finally, we excluded beneficiaries that did not choose a MA Prescription Drug Plan (MA-PD). The final estimating sample we constructed contained 93,518 beneficiaries in 2013.

To produce Figure 2, we first limited our sample to beneficiaries who were enrolled in MA in both 2012 and 2013 or who newly enrolled in 2013. Next, we ran 4 regressions: OOPC as the dependent variable in 2012 and separately in 2013 and total enrollee premiums as the dependent variable in 2012 and 2013. Estimates presented in Figure 2 are predicted values from each regression. Independent variables included: age, gender, race/ethnicity, individual-level health risk (using the CMS-derived HCC risk score), and presence of mental health diagnoses, and whether a beneficiary switched plans, which was used to vary the predictions. We also included indicator variables for the chosen MA plan's star rating and provider network size compared to both the MESP and to the median value in the beneficiary's county. The models included county-level fixed effects to control for unobserved aspects of the local MA market such as geographic cost variation or the types of plan offerings.

To produce Figure 3, we limited our sample to beneficiaries continuously enrolled in Medicare for 6 or more years. This restriction focused the comparison of plan choices for beneficiaries who have had a minimum number of years to make 1 or more plan selections. In the absence of this selection criterion, beneficiaries who had been enrolled in Medicare for several years, but who had switched plan in the past calendar year, would have been grouped with beneficiaries who newly entered Medicare or MA in the past year. These groups may be different across a number of unobservable characteristics.

The amounts shown in Figures 3 are predicted values from ordinary least squares (OLS) and person-level fixed effects regressions, respectively. In the OLS regression, the dependent variable is the difference between the enrollee premium of the beneficiary's chosen plan and the enrollee premium of the MESP. In the second OLS regression, the dependent variable is the difference between the expected OOPC of the beneficiary's chosen plan and the expected OOPC of the MESP plan. The independent variables of each regression are the beneficiary's: age, gender, race/ethnicity, individual-level health risk (using the HCC risk score), and presence of mental health diagnoses, and length of tenure in a plan in years, which was used to vary the predictions. We also included indicator variables for the chosen MA plan's star rating and provider network size compared to both the MESP and to the median value in the beneficiary's

county. The models included county-level fixed effects to control for unobserved aspects of the local MA market such as geographic cost variation or the types of plan offerings.

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eAppendix Table 1. Expected Spending for MA-PD Plans, and Alternative Results, 2013^a

	Total enrollee premiums	Expected OOPC	Premiums + OOPC (Col. 1 + Col. 2)	Premiums + OOPC compared to enrolled plan
<i>Results from main text</i>				
Plan in which beneficiary is enrolled	1667	2078	3745	n/a
Plan with largest projected enrollment	1675	2052	3727	-17
Plan with lowest total premium	1032	2264	3296	-448
Plan with lowest expected OOPC	2331	1525	3856	112
MESP plan (minimum value for premium + OOPC)	1141	1907	3048	-697
<i>Alternative results assuming individuals report “excellent” health</i>				
Plan in which beneficiary is enrolled	1667	1477	3144	n/a
Plan with largest projected enrollment	1675	1463	3138	-6
Plan with lowest total premium	1032	1583	2615	-529
Plan with lowest expected OOPC	2249	1089	3338	195
MESP plan (minimum value for premium + OOPC)	1074	1388	2462	-682
<i>Alternative results assuming individuals report “good” health</i>				
Plan in which beneficiary is enrolled	1667	2225	3892	n/a
Plan with largest projected enrollment	1675	2199	3874	-18
Plan with lowest total premium	1032	2419	3452	-441
Plan with lowest expected OOPC	2381	1625	4005	113
MESP plan (minimum value for premium + OOPC)	1144	2055	3200	-693

MA-PD indicates Medicare Advantage plan with Part D coverage; MESP, minimum expected spending plan; OOPC, expected out-of-pocket costs

^aAuthors’ calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Total enrollee premiums include the standard Part B premium, any additional premium the MA plan charges enrollees for Part

A and Part B benefits, and any premium for Part D coverage. Any reductions to enrollee premiums from MA plan rebates are incorporated in these amounts. Expected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries including for services or goods not covered by Medicare. All amounts shown for comparison plans are statistically different from the average amounts for beneficiaries' chosen plans at $P < .001$, except amounts for the plan with the largest projected enrollment.

eAppendix Table 2. Regression Results for Adjusted Values Reported in Figure 3 in Text^a

Dependent Variable: Premium difference between chosen plan and minimum expected spending plan

ESRD indicates end-stage renal disease; MESP, minimum expected spending plan

Independent variables	Coefficient	Standard error	T-statistic	P
Consecutive years in plan (=1) (excluded group)				
Consecutive years in plan (=2)	58.77	5.59	10.51	0.000
Consecutive years in plan (=3)	159.69	5.96	26.78	0.000
Consecutive years in plan (=4)	138.26	5.72	24.19	0.000
Consecutive years in plan (=5)	237.50	7.42	32.00	0.000
Consecutive years in plan (>5)	338.68	5.01	67.55	0.000
MESP has lower star rating than enrollee's plan	78.17	4.22	18.51	0.000
MESP has smaller network than enrollee's plan	-43.62	4.41	-9.89	0.000
Enrollee's plan at or above median star rating	173.35	5.46	31.77	0.000
Enrollee's plan at or above median network size	167.86	4.24	39.60	0.000
CMS Risk Score	-14.16	1.85	-7.64	0.000
Female	21.00	3.18	6.61	0.000
Race/Ethnicity Unknown	-15.32	49.94	-0.31	0.759
Black (or African American)	-58.74	5.37	-10.94	0.000
Other	-5.48	8.38	-0.65	0.513
Asian/Pacific Islander	-31.64	10.36	-3.06	0.002
Hispanic	-14.23	7.86	-1.81	0.070
American Indian/Alaska Native	-29.12	29.91	-0.97	0.330
Originally entitled because of disability	-7.21	5.12	-1.41	0.159
Originally entitled because of ESRD	257.89	66.00	3.91	0.000
Originally entitled because of disability and ESRD	153.71	78.92	1.95	0.051
Diagnosis for mental health condition	6.82	4.14	1.65	0.10
Enrollee Age	0.90	0.24	3.69	0.00
Constant term	68.19	19.61	3.48	0.00
Number of observations	93519			

^a Authors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Enrollee premiums include the standard Part B premium, any additional premium the MA plan charges enrollees for Part A and Part B benefits, and any enrollee premium for Part D coverage.

eAppendix Table 3. Regression Results for Adjusted Values Reported in Figure 3 in Text^a

Regression of difference between expected spending in plan and plan with minimum expected spending, 2013

Dependent Variable: Expected out-of-pocket cost difference between chosen plan and minimum expected spending plan

Independent variables	Coefficient	Standard error	T-statistic	P
Consecutive years in plan (=1) (excluded group)				
Consecutive years in plan (=2)	9.15	3.77	2.43	0.015
Consecutive years in plan (=3)	0.52	3.68	0.14	0.888
Consecutive years in plan (=4)	-2.31	3.65	-0.63	0.526
Consecutive years in plan (=5)	-44.16	4.51	-9.80	0.000
Consecutive years in plan (>5)	-104.43	3.23	-32.32	0.000
MESP has lower star rating than enrollee's plan	90.89	3.01	30.20	0.000
MESP has smaller network than enrollee's plan	52.40	3.15	16.65	0.000
Enrollee's plan at or above median star rating	-172.66	3.75	-46.07	0.000
Enrollee's plan at or above median network size	96.44	3.08	31.27	0.000
CMS Risk Score	29.66	1.39	21.29	0.000
Female	-2.72	1.95	-1.40	0.162
Race/Ethnicity Unknown	-47.35	33.46	-1.42	0.157
Black (or African American)	-24.54	3.70	-6.64	0.000
Other	-42.76	6.60	-6.48	0.000
Asian/Pacific Islander	-57.57	9.26	-6.22	0.000
Hispanic	-51.96	7.76	-6.69	0.000
American Indian/Alaska Native	-23.27	20.06	-1.16	0.246
Originally entitled because of disability	1.92	3.29	0.58	0.560
Originally entitled because of ESRD	36.27	66.88	0.54	0.588
Originally entitled because of disability and ESRD	-41.03	48.15	-0.85	0.394
Diagnosis for mental health condition	-1.42	2.59	-0.55	0.58
Enrollee Age	-0.40	0.15	-2.60	0.01
Constant term	228.21	12.29	18.57	0.00
Number of observations	93519			

ESRD indicates end-stage renal disease; MESP, minimum expected spending plan

^aAuthors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Enrollee premiums include the standard Part B premium, any additional premium the MA plan charges enrollees for Part A and Part B benefits, and any

enrollee premium for Part D coverage. **eAppendix Table 4.** Comparison of Alternative Regression Results for Figure 3 in Text^a

Regressions of difference between expected spending in plan and plan with minimum expected spending, 2013

Dependent Variable: Premium difference between chosen plan and minimum expected spending plan

Independent variables	eAppendix Table 2 coefficients (main results)	Alternative #1, all beneficiaries assigned “excellent” self-reported health	Alternative #2, all beneficiaries assigned “good” self-reported health
Consecutive years in plan (=1) (excluded group)			
Consecutive years in plan (=2)	58.77	55.79	58.35
Consecutive years in plan (=3)	159.69	153.26	155.78
Consecutive years in plan (=4)	138.26	128.76	135.35
Consecutive years in plan (=5)	237.50	231.79	234.67
Consecutive years in plan (>5)	338.68	328.64	335.61
MESP has lower star rating than enrollee’s plan	78.17	215.40	192.85
MESP has smaller network than enrollee’s plan	-43.62	-12.47	-54.84
Enrollee’s plan at or above median star rating	173.35	112.73	131.19
Enrollee’s plan at or above median network size	167.86	166.80	174.08
CMS Risk Score	-14.16	20.26	19.92
Female	21.00	21.28	20.83
Race/Ethnicity Unknown	-15.32	-17.43	-22.20
Black (or African American)	-58.74	-58.80	-57.82
Other	-5.48	-12.08	-10.35
Asian/Pacific Islander	-31.64	-31.78	-32.63
Hispanic	-14.23	-11.63	-15.01
American Indian/Alaska Native	-29.12	-23.23	-25.36
Originally entitled because of disability	-7.21	-1.18	-2.58
Originally entitled because of ESRD	257.89	246.65	267.91
Originally entitled because of disability and ESRD	153.71	142.14	147.57
Diagnosis for mental health condition	6.82	10.76	10.52
Enrollee Age	0.90	1.37	1.29
Constant term	68.19	44.32	-5.49
Number of observations	93519		

ESRD indicates end-stage renal disease; MESP, minimum expected spending plan

^aAuthors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Enrollee premiums include the standard Part B premium, any additional premium the MA plan charges enrollees for Part A and Part B benefits, and any enrollee premium for Part D coverage.

eAppendix Table 5. Comparison of Alternative Regression Results for Figure 3 in Text^a

Regressions of difference between expected spending in plan and plan with minimum expected spending, 2013

Dependent Variable: Expected out-of-pocket cost difference between chosen plan and minimum expected spending plan

Independent variables	eAppendix Table 3 coefficients (main results)	Alternative #1, all beneficiaries assigned “excellent” self- reported health	Alternative #2, all beneficiaries assigned “good” self- reported health
Consecutive years in plan (=1) (excluded group)			
Consecutive years in plan (=2)	9.15	3.97	13.44
Consecutive years in plan (=3)	0.52	3.57	6.48
Consecutive years in plan (=4)	-2.31	-0.73	3.02
Consecutive years in plan (=5)	-44.16	-33.49	-41.41
Consecutive years in plan (>5)	-104.43	-68.27	-100.32
MESP has lower star rating than enrollee’s plan	90.89	54.73	0.82
MESP has smaller network than enrollee’s plan	52.40	13.48	37.92
Enrollee’s plan at or above median star rating	-172.66	-74.43	-155.52
Enrollee’s plan at or above median network size	96.44	61.85	103.63
CMS Risk Score	29.66	-10.80	-18.33
Female	-2.72	-2.97	-4.21
Race/Ethnicity Unknown	-47.35	-22.87	-33.08
Black (or African American)	-24.54	-17.61	-28.40
Other	-42.76	-27.74	-35.84
Asian/Pacific Islander	-57.57	-43.84	-56.27
Hispanic	-51.96	-40.51	-57.14
American Indian/Alaska Native	-23.27	-15.80	-24.58
Originally entitled because of disability	1.92	-5.71	-5.57
Originally entitled because of ESRD	36.27	24.12	20.49
Originally entitled because of disability and ESRD	-41.03	-18.92	-21.04
Diagnosis for mental health condition	-1.42	-3.33	-6.86
Enrollee Age	-0.40	-0.62	-1.03
Constant term	228.21	164.04	342.82
Number of observations	93519		

ESRD indicates end-stage renal disease; MESP, minimum expected spending plan

^aAuthors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Expected OOPC is an actuarial projection of out-of-pocket costs for medical services and includes all health-related spending by Medicare beneficiaries including for services or goods not covered by Medicare.

eAppendix Table 6. Regression Results for Adjusted Values Reported in Figure 4 in Text^a

Person-level fixed effect regression of difference between expected spending in plan and plan with minimum expected spending, 2010-2013

Dependent Variable: Premium plus OOPC for chosen plan minus those values for MESP

Independent variables	Coefficient	Standard error	T-statistic	P
Consecutive years in plan (=1) (excluded group)	0.00	0.00	0.00	0.00
Consecutive years in plan (=2)	67.57	2.52	26.83	0.00
Consecutive years in plan (=3)	116.51	2.91	40.02	0.00
Consecutive years in plan (=4)	167.42	3.44	48.73	0.00
Consecutive years in plan (=5+)	186.31	3.92	47.51	0.00
MESP has lower star rating than enrollee's plan	138.72	2.17	63.88	0.00
MESP has smaller network than enrollee's plan	93.34	2.38	39.25	0.00
Enrollee's plan at or above median star rating	-2.69	2.95	-0.91	0.36
Enrollee's plan at or above median network size	37.74	2.42	15.61	0.00
CMS Risk Score	16.23	1.44	11.27	0.00
Became diagnosed for mental health condition	-1.26	3.07	-0.41	0.68
Year = 2011	-32.93	2.18	-15.11	0.00
Year = 2012	-33.90	2.09	-16.21	0.00
Year = 2013	-18.69	2.25	-8.30	0.00
Constant term	481.43	4.16	115.60	0.00
Number of observations	327180			

MESP indicates minimum expected spending plan; OOPC, expected out-of-pocket costs

^aAuthors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Enrollee premiums include the standard Part B premium, any additional premium the MA plan charges enrollees for Part A and Part B benefits, and any enrollee premium for Part D coverage.

eAppendix Table 7. Regression Results for Adjusted Values Reported in Figure 4 in Text^a

OLS regression of difference between expected spending in plan and plan with minimum expected spending, 2010-2013

Dependent Variable: Premium plus OOPC for chosen plan minus those values for MESP

Independent variables	Coefficient	Standard error	T-statistic	P
Consecutive years in plan (=1) (excluded group)				
Consecutive years in plan (=2)	87.62	2.87	30.50	0.000
Consecutive years in plan (=3)	127.15	3.07	41.43	0.000
Consecutive years in plan (=4)	157.95	3.41	46.37	0.000
Consecutive years in plan (>5)	191.46	2.55	74.96	0.000
MESP has lower star rating	129.11	2.35	54.92	0.000
MESP has smaller network	33.02	2.28	14.46	0.000
Enrollee's plan at or above median star rating	-50.81	2.78	-18.27	0.000
Enrollee's plan at or above median network size	201.17	2.10	95.92	0.000
CMS Risk Score	19.35	1.00	19.29	0.000
Female	15.13	1.76	8.60	0.000
Race/Ethnicity Unknown	-34.22	28.75	-1.19	0.234
Black (or African American)	-69.55	3.48	-19.98	0.000
Other	-42.46	5.60	-7.58	0.000
Asian/Pacific Islander	-83.59	7.16	-11.68	0.000
Hispanic	-62.54	6.44	-9.71	0.000
American Indian/Alaska Native	-60.92	20.91	-2.91	0.004
Originally entitled because of disability	-0.55	2.91	-0.19	0.851
Originally entitled because of ESRD	215.41	43.92	4.91	0.000
Originally entitled because of disability and ESRD	105.12	33.37	3.15	0.002
Diagnosis for mental health condition	4.25	2.29	1.85	0.064
Year = 2011	-50.51	2.74	-18.40	0.000
Year = 2012	-15.17	2.51	-6.04	0.000
Year = 2013	1.64	2.49	0.66	0.510
Enrollee Age	0.80	0.13	6.14	0.000
Constant term	377.29	10.44	36.14	0.000
Number of observations	327180			

ESRD indicates end-stage renal disease; MESP, minimum expected spending plan; OOPC, expected out-of-pocket costs

^aAuthors' calculations of data from the Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS). Expected OOPC is an actuarial projection of out-of-

pocket costs for medical services and includes all health-related spending by Medicare beneficiaries including for services or goods not covered by Medicare.