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Medicare Preferred Provider Organization Demonstration: Cost Impact and Biased Selection in Year One (2003)

Final Report

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EXECUTIVE SUMMARY

This report estimated the impact of the first year (2003) of the Medicare Preferred Provider Organization (PPO) Demonstration on total Medicare expenditures. The contributions of different types of payments, different types of enrollees, and different PPO Demonstration plans to the total cost impact were identified. Biased selection in PPO enrollment was also analyzed.

In 2003, the Centers for Medicare & Medicaid Services (CMS) implemented the PPO Demonstration, which offered 33 new MA PPO plans. The demonstration, which ran from 2003–2005, sought to increase the number and variety of health plan choices available to Medicare beneficiaries. This project was designed to test the impact of enhanced payment and risk-sharing arrangements between CMS and the plans on the range of options and benefits available to beneficiaries. This demonstration program was modeled after the PPO coverage available in the commercial market. Although all plans were required to offer out-of-network benefits, fewer specific requirements were applied to the benefit design than for most other MA plans. Differential cost sharing requirements in and out of network were intended to encourage enrollees to use services in a cost effective manner while not providing a disincentive towards seeking appropriate care.

The PPO Demonstration included two changes to the standard MA payment system as an enticement for plans to enter the demonstration. The first adjustment allowed PPO plans to be paid the higher of the MA base county payment rate, or 99 percent of the FFS average expenditure. The second adjustment included a "risk sharing" option to protect PPO plans against higher than expected medical costs. We estimated that the Medicare program paid more for the 89,334 beneficiaries enrolled in PPO Demonstration plans in 2003 than it would have paid in the absence of the demonstration. The total estimated cost impact was approximately $41 million. This amounted to $457 per PPO enrollee, and 9.3 percent of estimated expenditures without the demonstration.

Extra expenditures under the demonstration were the result of the design of the demonstration, the characteristics of the beneficiaries who chose to enroll in the demonstration, and the design of the Medicare program. Four factors accounted for the higher expenditures under the demonstration:

- The 99 percent of FFS per capita expenditures payment rate paid to demonstration plans where this payment exceeded the Medicare+Choice rates in the applicable counties in 2003. This factor accounted for about $21.6 million of the cost impact.

- Demonstration plans were offered risk sharing with Medicare, which was not available in the regular Medicare+Choice program. Net Medicare risk sharing resulted in about $6.8 million in additional payments to plans.

- Demonstration plans enrolled a favorable health status selection of beneficiaries previously enrolled in the original FFS program. Capitation payments under the

demonstration were greater than estimated FFS expenditures. This factor, together with the next, accounted for about $12.1 million of the cost impact.[1]

- The usual Medicare capitation payment rate was higher than average FFS per capita expenditures in some counties. This factor—which operated for all Medicare capitated plans, not just demonstration plans—increased Medicare expenditures whenever a FFS beneficiary enrolled in a capitated plan, even with a neutral health status risk selection.

Although expenditures were higher under the PPO Demonstration, the demonstration may have had offsetting benefits—such as expanding the range of plan choices available to beneficiaries and retaining some plans in the Medicare program--that justified higher expenditures in the eyes of policymakers. The first two factors that led to higher expenditures under the PPO Demonstration were unique to the demonstration, and are not a feature of local PPOs under the regular Medicare Advantage program in 2006 and beyond. Comprehensive diagnosis-based risk adjustment for Medicare Advantage fully implemented in 2006 should lessen or eliminate the impact of the third factor. Thus, higher Medicare expenditures under the demonstration do not imply that local PPOs are raising Medicare payments in 2006 (and after) more than other Medicare Advantage plan types.

We estimated that the predicted medical expenditures (costliness or health status) of PPO Demonstration enrollees was about the same as that of HMO enrollees in the PPO plans' service areas. Both PPO and HMO enrollees were predicted to be substantially less costly than service area FFS beneficiaries, on average. Hence, PPOs experienced about the same degree of favorable selection relative to FFS as HMOs did.

In addition to new Medicare beneficiaries, PPO plans enrolled beneficiaries who were previously enrolled in original FFS Medicare or in an HMO. Enrollees in PPO Demonstration plans who were previously in FFS were much less costly (much healthier) than the average FFS beneficiary in the area, while PPO enrollees who had previously been enrolled in HMOs were more costly (sicker) than the average HMO enrollee (excluding the largest-enrollment demonstration contract, which was an HMO to PPO rollover[2]). Hence, PPOs experienced a favorable selection from FFS but an adverse selection from HMOs. PPOs' greater freedom of provider choice than HMOs was attractive to sicker HMO enrollees, but not to sicker FFS beneficiaries.

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1 An additional $0.3 million of the demonstration cost impact was the result of higher demonstration non-risk-sharing payments to plans enrolling new Medicare program enrollees. We did not distinguish in our analysis the impacts of the various factors affecting payments for new Medicare program enrollees.

2 The largest demonstration contract contained 48,504 enrollees from an HMO plan who were rolled into their PPO plan in 2003.

SECTION 1
INTRODUCTION

This report estimated the impact of the first year (2003) of the Medicare Preferred Provider Organization (PPO) demonstration on total Medicare expenditures. We identified the contributions of different types of payments (fee-for-service, capitation, and risk sharing), different types of enrollees, and different PPO Demonstration plans to the total cost impact. We also analyzed biased selection in PPO enrollment.

We begin this report with an introduction to the PPO Demonstration and a discussion of the study objectives. Section 2 describes the methods and data used for our analyses. Section 3 presents the results of the cost impact and biased selection analyses. Section 4 offers conclusions. Tables providing additional detail on the models used in the analysis are contained in an appendix.

1.1 Background on the Medicare Preferred Provider Organization Demonstration

As Preferred Provider Organizations (PPOs) became the dominant model of managed health care among employers and other private-sector purchasers in the 1990s and into this decade, policy makers have increasingly viewed PPOs as an attractive option for Medicare. Policy makers favor PPOs for a number of reasons. First, PPOs offer a model of managed care that can be perceived as being "between" the traditional FFS and Health Maintenance Organization (HMO) options. Because individuals covered under PPOs generally have access to a wide range of physician choices without gatekeepers and prior approvals, as well as the option to use out-of-network providers (for higher co-payments), it was thought that PPOs might appeal to more Medicare beneficiaries enrolled in FFS who were reluctant to enroll in managed care. Second, the popularity of PPOs in the private sector might ignite more beneficiary interest in the MA program under new MMA legislation. As part of a larger effort to "modernize" aspects of the Medicare Fee for Service (FFS) and Medicare Advantage (MA) programs by having them adopt various strategies more widely used in the private sector, the Medicare Modernization Act (MMA) of 2003 included the introduction of "regional PPOs" as a key component of Medicare Advantage. By 2006, Medicare options included PPOs available to all Medicare beneficiaries, not just beneficiaries in select market areas.

Even before the MMA, the Balanced Budget Act provided a PPO option for Medicare beneficiaries, but there was little interest until the PPO Demonstration provided increased payments and added risk sharing. In 2003, the Centers for Medicare & Medicaid Services (CMS) implemented the PPO Demonstration, which offered 33 new MA PPO plans. The demonstration, which ran from 2003–2005, sought to increase the number and variety of health plan choices available to Medicare beneficiaries. This project was designed to test the impact of enhanced payment and risk-sharing arrangements between CMS and the plans on the range of options and benefits available to beneficiaries. This demonstration program was modeled after the PPO coverage available in the commercial market. Although all plans were required to offer out-of-network benefits, fewer specific requirements were applied to the benefit design than for most other MA plans. Differential cost sharing requirements in and out of network were intended to encourage enrollees to use services in a cost effective manner while not providing a disincentive towards seeking appropriate care.

PPO plans were paid capitation payments in 2003 similar to the payment method for all MA health plans. These payments were risk adjusted for demographics and partially for health status as determined by inpatient diagnosis codes, to (partially) insulate health plans against the risk of incurring high medical costs due to enrolling an extraordinarily sick population. During 2003, the risk adjustment of capitation payments was 90 percent demographic (using the Adjusted Average Per Capita Cost, or AAPCC, methodology) and 10 percent diagnosis (using the Principal Inpatient Diagnostic Cost Groups, or PIP-DCG, model).

The PPO Demonstration included two changes to the standard MA payment system as an enticement for plans to enter the demonstration. The first adjustment allowed PPO plans to be paid the higher of the MA base county payment rate, or 99 percent of the FFS average expenditure[3]. The second adjustment included a "risk sharing" option to protect PPO plans against higher than expected medical costs.

Risk sharing arrangements under this demonstration, where applicable, were specific to each plan offering a PPO product, and were symmetrical, meaning that the sharing arrangement between CMS and the plan was the same for both losses and savings. The risk sharing arrangement specified a targeted medical loss ratio, or medical expense target, reflected as a percentage of total plan revenue. The risk sharing arrangement was reconciled 12 months after the close of the contract year, at which point the actual medical loss ratio was established. To the extent medical expenses exceed the targeted medical expense by more than a pre-established amount, CMS and the organization shared in the losses. Similarly, if the participating organization experienced savings, CMS shared in the savings. All of the participating organizations that had risk-sharing arrangements with CMS as part of their demonstration terms and conditions were at full risk below a certain threshold (up to 2–5 percent in 2003). A corridor was established around the medical loss ratio, meaning the first 2–5 percent of any loss or gain in relation to the targeted ratio was assumed by the plan. Beyond the corridor, both CMS and the plan shared gains/losses under various specified arrangements. However, CMS's share of gains/losses was never more than 80 percent.

Medicare Preferred Provider Organization (PPO) demonstration plans began providing services to Medicare beneficiaries on January 1, 2003. The 3-year demonstration concluded in December, 2005. In 2006, many of the demonstration plans became "local PPOs" under the regular Medicare Advantage program. Our analysis in this report is limited to 2003 and includes only the 33 PPO Demonstration plans that accepted enrollees during 2003. Also, we do not include the $100,000 implementation support payment that CMS made to some of the PPO Demonstration plans in our cost impact analysis.

1.2 Study Objectives

The study's purpose was to answer two related questions. First, what was the impact of the PPO Demonstration on Medicare expenditures for beneficiaries who enrolled in the PPO Demonstration? Second, were beneficiaries who enrolled in the PPO Demonstration different

[3] Beginning in April 2004, the MA base county payment rate must be at least 100 percent of the FFS average expenditure.

from beneficiaries who did not enroll with regard to expected medical care expenditures, that is, was there biased selection in PPO enrollment?

Cost Impact

The cost impact analysis is an estimate of the impact of the PPO Demonstration, including any biased selection that it experiences, on Medicare program expenditures. The estimated impact on program payments is the difference between actual payments for PPO enrollees (including risk sharing payments) and estimates of what would have been paid for PPO enrollees had they not enrolled in a PPO. If PPO enrollees had not enrolled in a PPO, they would have been enrolled in either FFS or another MA plan. If the local market shares of MA and FFS are reasonably stable, the simplest and most reasonable assumption is that PPO enrollees would have remained in FFS if they were enrolled in FFS at the end of the prior year (2002), and similarly for MA.

We lack prior enrollment information for PPO enrollees who newly enrolled in the Medicare program in 2003. Without any good means of predicting whether these beneficiaries would have enrolled in FFS or MA in the absence of the PPO Demonstration, we randomly assigned them to either FFS or MA in the same proportion as continuing enrollees in PPO plans.

Thus, estimating program expenditure impacts requires three component estimates:

1. Actual 2003 Medicare payments for 2003 PPO enrollees, including risk sharing payments;

- Estimated 2003 MA payments for 2003 PPO enrollees who were:

    a. Enrolled in an MA plan in December 2002, or

    b. New to the Medicare program in 2003 and randomly assigned to MA;

- Estimated 2003 FFS payments for 2003 PPO enrollees who were:

    – Enrolled in FFS in December 2002, or

    – New to the Medicare program in 2003 and randomly assigned to FFS.

Biased Selection

Our biased selection analysis addresses how PPO enrollees differ from non-enrollees with regard to expected expenditures. Analyzing biased selection is important for several reasons. First, the analysis indicates whether PPOs appealed to a broad cross-section of Medicare beneficiaries, both healthy and sick and of different demographic characteristics. Many studies have found that traditional Medicare HMOs experience favorable selection (Mello et al., 2003; Hellinger 1995; and PPRC 1996 provide reviews of the literature), which was attributed to reluctance of sicker beneficiaries with established providers to accept HMO restrictions on provider choice. With the greater access to a wider range of providers that PPOs provide, they may be more appealing to beneficiaries in poorer health undergoing more frequent medical

treatment. Indeed, studies of commercial PPOs have found that they experience selection intermediate between traditional FFS indemnity plans and closed panel HMOs (Wei, Ellis, and Ash, 2001). PPO Demonstration plans also may have been less averse to enrolling sicker beneficiaries because the risk sharing provisions in their demonstration reimbursement contracts limited their potential financial downside from such beneficiaries.

Second, biased selection has implications for Medicare program payments. If healthier beneficiaries choose PPOs rather than FFS, and this choice is not fully accounted for by the MA capitation payment formula, Medicare program payments could rise. In a widely cited study, Brown, et al. (1993) found that Medicare HMOs increased program payments by 5.7 percent because of favorable selection. Riley, et al. (1996) made a similar estimate. The implementation of health-based risk adjustment should improve the accuracy of Medicare capitation payments. But in the first year of the PPO Demonstration, 2003, a demographic model still comprised 90 percent of MA payments, with the other 10 percent adjusted by inpatient diagnoses. Hence, considerable opportunity for profiting from risk selection existed in the first year of the PPO Demonstration.

Measures of biased selection may be categorized by timing relative to PPO enrollment, and type. Previous studies have measured expenditures and health status indicators **prior** to enrollment, **during** enrollment, and **post**-enrollment. The use of pre- and post-enrollment measures was driven partly by limited availability of data during enrollment. But these measures also have conceptual advantages and disadvantages. Prior use differences between PPO enrollees and non-enrollees may overstate selection bias if there is "regression to the mean" in use and expenditures once enrollment occurs (Welch, 1985). Prior use differences for new enrollees also may not be representative of selection among the larger numbers of "continuing enrollees".[4] Indicators measured during the period of enrollment may be confounded by the different utilization patterns, benefit design, cost sharing, and quality of care of PPOs versus FFS or other MA plans (Tchernis, Normand, Pakes, et al. 2006; Robinson and Gardner, 1995). Indicators measured for PPO disenrollees may not be representative of all PPO enrollees (Cox and Hogan, 1997). Types of indicators that were used to measure biased selection include expenditures (Pauly and Zheng, 2003); utilization (Hill and Brown, 1990); mortality (Cox and Hogan, 1997); diagnoses; functional status (Lichtenstein, et al., 1991), self-rated health status (Riley, et al., 1996); and risk scores (Greenwald, et al., 2000; Feldman, Dowd and Wrobel, 2003; Pope et al., 2006).

In this study, we analyze biased selection indicators—demographics, predicted expenditures, and risk scores—measured during the period of PPO enrollment in 2003. These characteristics for PPO enrollees are compared to the same indicators measured for FFS and MA enrollees residing in the service areas of the PPO plans. The selection indicators we study—unlike utilization for example—are not confounded by measurement during the period of PPO enrollment. A beneficiary's demographics and diagnostic profile should be largely unaffected by PPO versus FFS or HMO enrollment.

[4] This is less of an issue for the PPO Demonstration because all the PPO plans are startups.

In the remainder of this report, we describe the methods and data used for our analyses (Section 2), present the results of the cost impact and biased selection analyses (Section 3), and offer conclusions (Section 4). An appendix provides tables with additional detail on the models used in our analyses.

SECTION 2
METHODS AND DATA

This section describes our methodology and the data that we used for the cost impact and biased selection analyses. We begin in Section 2.1 with a description of the cost impact analysis and include how we calculated actual Medicare payments for PPO Demonstration enrollees (including risk sharing payments). We also explain how we estimated what Medicare payments for PPO enrollees would have been in the absence of the PPO Demonstration. In Section 2.2, we discuss our biased selection analysis, including the calculation of predicted expenditure risk scores for the PPO Demonstration enrollees and the HMO and FFS comparison group populations. In Section 2.3, we describe the data sources that were used in both analyses, focusing on claims, payment, and enrollment data. Finally, in Section 2.4, we discuss the treatment of the largest demonstration contract, which enrolled over half of beneficiaries ever enrolled in the demonstration in 2003, in our presentation of cost impact and biased selection results.

2.1 Cost Impact Methods

In this subsection, we first give an overview of our cost impact methods. Then we discuss specific components of the methods in more detail.

2.1.1 Overview of Methods for Determining Actual Payments and Estimated Payments Absent the Demonstration

The cost impact of the PPO Demonstration is defined as the difference between (1) actual Medicare payments made for PPO Demonstration enrollees (including risk sharing payments), and (2) estimated Medicare payments for PPO enrollees in the absence of the demonstration (i.e., estimated Medicare payments for PPO enrollees assuming they had not enrolled in a PPO Demonstration plan). We give a brief overview of the calculation of actual payments, and then provide a longer discussion of how payments in the absence of the demonstration were estimated.

Actual Payments

Actual payments to PPO plans were calculated for 2003. Actual payments consisted of capitation payments and risk sharing payments. Capitation payments on behalf of PPO enrollees were tabulated from the CMS Monthly Payment files. Results of the risk sharing reconciliations for 2003 were provided by CMS.[5]

Estimated Payments in the Absence of the Demonstration

As well as calculating actual PPO payments, we need to estimate payments that would have been made for PPO enrollees in 2003 in the absence of the demonstration. PPO enrollees consist of beneficiaries who were (1) enrolled in the Medicare program prior to 2003

[5] Risk sharing payments for one PPO organization were not finalized at the time this report was prepared, and thus are not included in our results.

("continuing Medicare enrollees"), and (2) beneficiaries who newly enrolled in Medicare in 2003 ("new Medicare enrollees"). About 92 percent of PPO enrollees in 2003 were continuing Medicare enrollees. We first give an overview of expenditure prediction methods for continuing Medicare enrollees, then for new Medicare enrollees.

PPO Continuing Medicare Enrollees. We divided the continuing Medicare enrollee PPO population into two categories based on prior enrollment. Approximately half of the beneficiaries who enrolled in a PPO Demonstration plan during 2003 were enrolled in other Medicare managed care health plans (which for simplicity we call "HMOs"[6]), and the other half were previously enrolled in original FFS Medicare. We made the assumption that in the absence of the demonstration, continuing Medicare enrollees would have remained in their prior (2002) enrollment status.

For 2003 PPO enrollees who were enrolled in FFS in the prior year, we estimated what Medicare payments would have been for these beneficiaries if they had not enrolled in a PPO plan, under the assumption that they would have remained in FFS without the PPO option. To make this estimate, we followed the approach of Brown et al. (1993) and Robinson and Gardner (1995) and estimated an expenditure prediction equation. The prediction equation was estimated using FFS beneficiaries residing in PPO service areas. Expenditures for them were regressed on expenditure predictors available for both PPO and FFS enrollees. These predictors included demographics, diagnosis-based risk scores, and geographic region.[7] The FFS prediction model used a modified version of the CMS-HCC risk adjustment model (Pope et al., 2004; Olmsted et al., 2006) that is now used to adjust capitation payments to Medicare Advantage health plans. The CMS-HCC model uses diagnosis codes recorded on claims to assign Hierarchical Condition Categories (HCCs) that represent major diseases present for each beneficiary.

For 2003 PPO enrollees who were enrolled in MA in the prior year, we estimated what Medicare payments would have been for these beneficiaries if they had not enrolled in a PPO plan, under the assumption that they would have remained in MA without the PPO option. If the PPO chose the MA payment rate, with no risk sharing, simulated MA payments for these enrollees were the same as their actual PPO payments, and hence, there is no net effect on Medicare expenditures. But if, for example, the PPO received the capitation payment option of 99 percent of the FFS average expenditure, then Medicare payments for PPO enrollees necessarily exceeded what Medicare would have paid other MA plans for the same enrollees.

PPO New Medicare Enrollees. About 8 percent of PPO enrollees were newly enrolled in the Medicare program in 2003. We did not have prior enrollment status for these beneficiaries. Moreover, we had limited information to predict whether these new Medicare enrollees would have chosen FFS or MA in the absence of the PPO option. The diagnostic profiles of the new enrollees were incomplete and most were 65-year olds, resulting in limited variation in age. For

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6 We use "HMO" to mean any Medicare health plan. Most Medicare health plan enrollees were in HMOs.

7 This approach to expenditure prediction has been criticized because of the possible self-selection of beneficiaries into sectors (FFS vs. MA) based on their expected utilization patterns, leading to inaccurate expenditure predictions (Dowd, et al., 1996; Robinson and Gardner, 1995). We believe that our measurement of health status was more accurate than in prior studies (through diagnostic risk scores) and will mitigate the selection concern.

these reasons, to predict payments in the absence of the PPO Demonstration, we took the simple approach of randomly assigning PPO new Medicare enrollees to FFS or MA in the same proportion as the prior enrollment (FFS or MA) of PPO continuing Medicare enrollees. This assignment results in about half of the PPO new Medicare enrollees being randomly assigned to FFS and about half to MA for the purposes of predicting payments in the absence of the demonstration.

To predict expenditures for PPO new Medicare enrollees assigned to FFS, we used a demographic expenditure prediction model rather than a model based on both demographics and diagnoses. New Medicare beneficiaries in 2003 who enrolled during the year did not have a complete diagnostic profile, and thus the full prediction model could not be used.

MA capitation payments were estimated for PPO new Medicare enrollees assigned to MA. These capitation payments were equal to actual payments to PPOs, except for beneficiaries residing in higher PPO payment counties (where PPOs received the 99 percent FFS rate rather than the MA rate).

Through the above steps, we obtained estimates of actual Medicare payments for PPO enrollees, and payments that would have occurred in the absence of the PPO Demonstration. The difference is the impact of the demonstration on Medicare payments. We now describe our methods in more detail.

2.1.2 Geographic Area for Analysis

Our analysis is constrained to the PPO Demonstration plan service areas. The combined PPO service area was defined as the 194 counties where at least one open-enrollment PPO Demonstration plan was offered during 2003.[8] This service area included all or a portion of 20 states: Alabama, Arizona, Florida, Illinois, Indiana, Kentucky, Louisiana, Maryland, Missouri, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Washington, and West Virginia. The PPO, HMO, and FFS samples used in this analysis were all drawn from beneficiaries residing in this area, which we refer to as "the PPO service area."

2.1.3 PPO, HMO, and FFS Samples

We drew a sample of all Medicare beneficiaries residing in the PPO service area using the Medicare Enrollment Database (EDB). All beneficiaries alive on January 1, 2003 were eligible for sample selection. Beneficiaries who had at least one month of PPO enrollment during 2003 were assigned to the PPO sample. This sample includes beneficiaries with some FFS or HMO enrollment during 2003. The PPO sample includes 89,334 beneficiaries.

Beneficiaries with at least one month of HMO enrollment during 2003 were assigned to the HMO sample, excluding those selected for the PPO sample. The HMO sample included 1,881,960 beneficiaries. This sample included beneficiaries with some FFS enrollment.

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8 More than one PPO Demonstration plan was offered in some counties.

All remaining beneficiaries with at least 1 month of Part A and Part B enrollment in 2003 were eligible for the FFS sample. For each county in the PPO service area, up to 10,000 beneficiaries meeting these criteria were selected for the FFS 2003 sample. For counties with more than 10,000 beneficiaries eligible for the FFS sample, a random selection of 10,000 beneficiaries was made and sampling weights were created. The sampling weight is equal to the inverse of the probability of selection for each beneficiary in a county. For example, if a county had 100,000 eligible FFS beneficiaries, 10,000 FFS sample members were selected and each received a weight of 10 in our analyses. Sampling FFS beneficiaries was necessary because if 100 percent of eligible FFS beneficiaries had been selected, the analysis file would have been extremely large (approximately 10 million FFS beneficiaries were eligible for our sample). Our sampling procedure kept the analysis file manageable, while maintaining statistical precision across geographic areas. Our weighting procedure ensured that our results were representative of the entire FFS population residing in the PPO service area. The FFS sample included 2,530,133 beneficiaries representing total FFS enrollment in PPO service area counties of 7,900,346.

2.1.4 Medicare Payments to PPO Plans

The first step in estimating the cost impact of the PPO Demonstration was to calculate actual expenditures made by CMS to PPO Demonstration organizations. These payments were made as monthly capitation payments and ex post risk sharing payments.

We generated total monthly payments to PPO Demonstration plans using the CMS Monthly Payment files. These files contain a record for each beneficiary and month that a beneficiary was enrolled in a PPO Demonstration plan during 2003. Not infrequently, adjustments are made to prior months' payments to reflect, for example, updated information on beneficiary enrollment status at that time. We calculated 2003 payments net of all adjustments made during and after 2003, through December 2004. Thirty-three PPO Demonstration plans had enrollment for which direct payments were made from CMS in 2003. Payments were made on behalf of 89,334 unique beneficiaries in 2003.

In addition to capitation payments, CMS provided RTI with total risk sharing reconciliation amounts for PPO Demonstration plans for 2003. Health plans 12, 14 and 27 in New Jersey, Maryland, and Pennsylvania had not reconciled their risk sharing at the time this report was written. Thus, the risk sharing amounts for these plans are not reflected in our analysis.

2.1.5 Estimated Payments for PPO Continuing Medicare Enrollees in Absence of the Demonstration

To estimate payments in the absence of the demonstration for 2003 PPO enrollees who were continuing Medicare enrollees, we made a simplifying assumption: in the absence of the demonstration, these beneficiaries would have remained in their enrollment status as of December 31, 2002. We estimated the 2003 Medicare HMO or FFS payments that would have been made for 2003 PPO enrollees. PPO enrollees were assigned to HMO or FFS in 2003 by their prior enrollment status. Estimated HMO payments in the absence of the demonstration are based on actual PPO payments where they were identical to HMO payments, or adjusted PPO payments where PPO payments exceeded HMO payments. To estimate FFS payments absent the demonstration, a FFS prediction model is employed that uses health status (diagnoses),

demographics, and per capita expenditures in a beneficiary's local area (geography) to predict payments.

Estimating Payments for PPO Beneficiaries Enrolled in an HMO Prior to the Demonstration. During 2003, the PPO Demonstration paid the higher of the HMO monthly county capitation rate or 99 percent of the Medicare FFS costs of beneficiaries residing in the county. The Monthly Payment Files used in our analysis record actual capitation payments to PPOs, but not the capitation payment that would have occurred if the beneficiary were enrolled in an HMO. In counties where PPO and HMO payment rates were identical, we used actual PPO payments to estimate HMO payments. Where actual PPO payments exceeded HMO payments, we used the CMS-published 99 percent FFS county rates and MA rates for 2003 to adjust actual PPO payments to estimate HMO payments. This method is described below.

For counties where the 99 percent FFS rate exceeded the MA rate (which we term "99 percent FFS counties"), we calculated the ratio of the HMO rate to the 99 percent FFS rate. We then used this ratio to adjust actual PPO payments to counterfactual HMO payments as follows:

> Estimated PPO enrollee counterfactual HMO payment in a 99 percent FFS county = (HMO county rate/99 percent of FFS rate) * actual payment for PPO beneficiary.

Finally, beneficiaries residing in counties where the 99 percent FFS average expenditure was less than the HMO county rate receive their actual PPO payment as their counterfactual HMO payment.

Estimating Payments for PPO Enrollees Enrolled in FFS Prior to the Demonstration. To estimate Medicare payments for PPO beneficiaries enrolled in FFS prior to the start of the demonstration, we first estimated a model to predict FFS expenditures from a beneficiary's health status (diagnoses), demographics, and geographic location. This model was calibrated on our 2003 sample of FFS beneficiaries residing in the combined PPO service area. Then we combined the estimated effects of these factors from the model with the characteristics of the 2003 PPO enrollees who were enrolled in FFS at the end of 2002. The result was predicted 2003 FFS expenditures for the PPO sample, had they remained enrolled in FFS in 2003 rather than switched to a PPO. Diagnoses in 2003 for PPO enrollees were available because CMS collected diagnosis codes from managed care encounters for PPO enrollees to risk adjust 2004 Medicare Advantage capitation payments.

After sample restrictions for model calibration, our FFS sample used for model calibration consisted of 2,193,153 unique beneficiaries that lived in the PPO service area during 2003. Beneficiaries in the sample were assigned zero or one or more diagnostic categories based on their diagnosis codes recorded on claims during 2003. In addition, each beneficiary was assigned to one of 24 age and sex cells (e.g., "female, 65–69"). Lastly, beneficiaries were assigned to 1 of 86 Metropolitan Statistical Areas (MSAs) or state non-metropolitan areas based on their Social Security Administration state and county codes available on their Medicare Denominator file record. State non-metropolitan areas included all counties not mapped to a MSA for the 21 States with PPO Demonstration plan availability.

Total expenditures for beneficiaries in the FFS sample were calculated as the sum of inpatient, outpatient, Part B physician/supplier, skilled nursing facility (SNF), home health, and durable medical equipment (DME) claims for each month enrolled in Parts A and B Medicare during 2003. Beneficiaries were weighted by the product of their sampling weight and their fraction of months enrolled in Medicare during 2003. For example, if a beneficiary's sampling weight was 10 and they were alive and enrolled in Medicare for 6 months in 2003, their weight was 10*(6/12) = 5.

We calibrated a three part prediction model to estimate FFS expenditures based on beneficiary characteristics, similar to the "concurrent" CMS-HCC risk adjustment models[9] that we have developed previously (Olmsted et al., 2006). The model consisted of the following components or "stages:"

Stage 1: Predict FFS expenditures using beneficiary health status (diagnoses).

Stage 2: Adjust Stage 1 predictions for beneficiary age-sex and Medicaid status.

Stage 3: Adjust Stage 2 predictions for beneficiary geographic location.

We include the explanatory variables and their estimated effects for each of the three stages of the expenditure prediction model in the appendix tables.

In Stage 1 of the model, total expenditures were regressed on the "HCC" diagnostic categories used in CMS' Hierarchical Condition Categories risk adjustment model.[10] For example, one included HCC is "Congestive Heart Failure." The first stage accounts for differences in health status among beneficiaries and provides most of the predictive power of the three-stage model. Also included as an explanatory variable in the regression was the NOCMSHCC variable indicating that the beneficiary was not assigned one of the HCC disease flags. The coefficient for this variable represents the average cost of a beneficiary that does not have any of the HCC diseases or conditions during 2003. The remaining coefficients represent the expected marginal cost of the disease or condition for FFS beneficiaries in the PPO service area during 2003. Payments are predicted concurrently in 2003 for the PPO service area, and thus no adjustments for inflation were needed.

Stage 2 of the model adjusted the Stage 1 predictions for beneficiary age, sex, and Medicaid status. Age and sex are measured by the 24 age-sex cells, and Medicaid by an indicator variable for any Medicaid-enrolled months in 2003. After the Stage 2 adjustments, the model predicts expenditures correctly on average for each of the 24 age/sex cells, and by Medicaid/non-Medicaid status. The effects of age/sex and Medicaid are allowed to be different for beneficiaries

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9 A concurrent risk adjustment model uses this year's information (e.g., diagnoses) to predict this year's expenditures, whereas a prospective risk adjustment model uses prior year's information to predict this year's diagnoses.

10 The CMS-HCC model is used to risk-adjust Medicare Advantage capitation payments to Medicare health plans. Though it employs the same diagnostic categories, the CMS-HCC model has several differences from the model used in this report. Most important, the CMS-HCC model is a "prospective" model that predicts next year's expenditures from this year's diagnoses. The model used in this report is a "concurrent" model that uses this year's diagnoses to predict this year's expenditures. Also, the CMS-HCC model is a single-stage, not a three-stage model.

without any major diagnoses (HCCs) versus beneficiaries with at least one major diagnosis (HCC). As part of the Stage 2 adjustments, a "spline" (piecewise linear) functional form is used. Use of the spline allows for a more accurate estimation of expenditures, and diagnosis and age/sex effects on expenditures, across the spectrum of beneficiary health status ranging from healthy individuals without any major diagnoses (HCCs) to very sick beneficiaries with multiple serious diagnoses (HCCs).[11]

In Stage 3 of the model, expenditure predictions were adjusted for beneficiary geographic residence. The ratios of predicted to actual expenditures for beneficiaries residing in each of the 86 MSA/state non-metropolitan areas were used as multipliers to adjust predicted expenditures from Stage 2 to produce the final prediction. These 86 geographic multipliers ensured that mean predicted expenditures for the beneficiaries in each geographic region were equal to mean actual expenditures for those beneficiaries.

The three-stage model produces a prediction of 2003 total Medicare FFS expenditures that is accurate for each geographic area, age-sex and Medicaid group, and health status. This prediction model estimated the Medicare expenditures that 2003 PPO enrollees previously enrolled in FFS would have incurred had they remained in FFS in 2003. This prediction was done by combining the demographic characteristics, diagnoses, and residence location of each beneficiary in the PPO sample with the estimated effects of these characteristics on FFS expenditures in the prediction model.

2.1.6 Estimated Payments for PPO New Medicare Enrollees in Absence of the Demonstration

We did not have prior enrollment status for beneficiaries newly enrolled in the Medicare program in 2003. To predict 2003 payments in the absence of the PPO Demonstration for these beneficiaries, we randomly assigned them to FFS or MA in proportion to the prior enrollment status of PPO continuing Medicare enrollees. To predict expenditures for PPO new Medicare enrollees assigned to FFS, we used a demographic expenditure prediction model rather than a model based on demographics and diagnoses. Medicare beneficiaries who enroll during the year do not have a complete diagnostic profile, and thus the full prediction model could not be used.[12]

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[11] We considered a single-stage estimation including diagnoses, demographics, and geographic location. Though this model would have predicted average expenditures correctly for included characteristics across the FFS calibration sample, it would have produced anomalous and biased (e.g., negative) predictions for some sample members, especially beneficiaries with characteristics different from the FFS average. Characteristics of PPO enrollees were different from the average for FFS beneficiaries, thus a single stage model could have produced biased expenditure predictions for PPO enrollees. For this reason, we preferred the three-stage model with Stage 2 spline, which estimated expenditures accurately across the entire range of FFS beneficiaries and hence produced unbiased expenditure predictions for PPO enrollees.

[12] In reporting results, we defined a new Medicare enrollee as any beneficiary who enrolled in Medicare (both Part A and Part B) on or after January 1, 2003. Beneficiaries who enrolled in Medicare on January 1, 2003 have a complete 2003 diagnostic profile (up to 12 months of diagnoses) and thus receive an expenditure prediction from the continuing enrollee model. However, they are treated as new Medicare enrollees for reporting purposes.

MA capitation payments were estimated for PPO new Medicare enrollees assigned to MA. These were equal to actual payments to PPOs, except for beneficiaries residing in higher PPO payment counties (where PPO demonstration organizations received the 99 percent FFS rate rather than the MA rate).

Assignment of New Medicare Enrollees. PPO beneficiaries who were new Medicare enrollees were randomly assigned based on the percentage of PPO continuing Medicare enrollees who were in prior FFS or HMO status. To generate the ratio of beneficiaries enrolled in HMO, all beneficiaries in the PPO sample are counted in the denominator excluding new Medicare enrollees and beneficiaries enrolled in PPO Demonstration Contract 15.[13] We excluded beneficiaries from Contract 15 because they were rolled-over from a prior HMO health plan in 2002. Contract 15 beneficiaries had to opt-out from the new Contract 15 PPO plan and thus were significantly different from the remaining PPO beneficiaries who opted into PPO Demonstration health plans. If we had included Contract 15 in determining the assignment ratio, the assignment of PPO new Medicare enrollees would have been biased towards HMO.

The numerator of the assignment ratio was equal to the count of beneficiaries qualifying for the denominator who were enrolled in an HMO in December of 2002. The percentage of HMO beneficiaries (numerator/denominator) is then used to assign new Medicare enrollees to HMO or FFS as follows. A random number from 0 to 1 was generated. If this number was less than or equal to the percentage of HMO beneficiaries calculated as described above, then the beneficiary was assigned to HMO. Otherwise, the beneficiary was assigned to FFS. All PPO beneficiaries who were identified as new Medicare enrollees were assigned to either HMO or FFS using this method.

A beneficiary assigned to HMO received a 2003 expenditure prediction in the same manner as a continuing enrollee identified as enrolled in HMO in December 2002. There is no separate HMO payments prediction methodology for new Medicare enrollees. A beneficiary assigned to FFS received a 2003 expenditure prediction from the New Enrollee expenditure prediction model, which we now describe.

New Medicare Enrollee Expenditure Prediction Model. The new Medicare enrollee expenditure prediction model used demographic and geographic information to predict total expenditures for beneficiaries in 2003. The model was similar to Stages 2 and 3 of the continuing enrollee prediction model described above. Prediction of expenditures by diagnoses (Stage 1) was not implemented for new Medicare enrollees because they did not have complete 2003 diagnostic profiles. The new Medicare enrollee prediction model is thus a two-stage model. The calibrated two stages of the new enrollee model are shown in the appendix tables.

To calibrate the new enrollee expenditure prediction model, we first regressed total 2003 expenditures on 24 age-sex categories and 24 Medicaid/age-sex interactions. A combined sample of continuing and new 2003 FFS enrollees was used to increase the accuracy of the estimated

[13] In this report, we refer to each of the 33 individual PPO Demonstration contracts analyzed by an arbitrary "contract number" running from 1 to 33 that we generated to distinguish the contracts, but maintain their anonymity.

demographic coefficients. The new Medicare enrollee FFS sample alone had only 338,268 beneficiaries compared to the 2,530,133 in the combined sample.

Then mean actual FFS expenditures are compared to mean predicted expenditures for each of the 86 MSA/state non-metropolitan areas. Multipliers similar to the continuing enrollee FFS model are constructed as the ratio of mean actual expenditures to mean predicted expenditures. Each average is created weighting by the product of the sampling weight and the eligibility fraction.

Finally, the demographic characteristics and geographic location of the 2003 PPO new Medicare enrollees assigned to FFS were fed into the new enrollee expenditure prediction model to generate estimated 2003 FFS expenditures for each such beneficiary.

2.2 Biased Selection Methods

While the cost impact analysis focused on the impact of the PPO Demonstration on CMS payments, the biased selection analysis analyzed the types of beneficiaries who chose to enroll in the PPO Demonstration. We defined biased selection as any non-random enrollment of beneficiaries into PPO plans relative to FFS or HMO plans. Our biased selection analysis drew on the samples, data, and methods used in the cost impact analysis to compare the characteristics of PPO enrollees to those of HMO and FFS enrollees.

We compared PPO enrollees to HMO and FFS enrollees residing in the PPO service area. The samples of PPO, HMO, and FFS beneficiaries are described in Section 2.1.3. PPO, HMO, and FFS enrollees were compared on two types of characteristics: demographics, and predicted expenditures/health status. The demographic characteristics available from Medicare enrollment records were age, sex, and Medicaid (poverty) status.

Expenditures were predicted for all three types of beneficiaries—PPO, HMO, and FFS—using the three-stage FFS expenditure prediction model described above in Section 2.1.5. This model was calibrated on FFS beneficiaries residing in the PPO service area, and thus predicted comparable 2003 FFS expenditures for all three types of beneficiaries. PPO, HMO, and FFS beneficiary demographic characteristics, diagnoses, and geographic location were inputted to the model, and it outputted predicted expenditures for each beneficiary.

As well as comparing predicted expenditures directly, we calculated risk scores for comparing the PPO, HMO, and FFS samples. Risk scores measure a beneficiary's expected expenditures relative to an "average" beneficiary. For our analysis we normalized risk scores to the entire analysis sample, i.e., to all the beneficiaries—including PPO, HMO, and FFS—residing within the combined PPO service area. This was done by dividing predicted expenditures for each beneficiary by average predicted expenditures for the entire sample. With this normalization, a beneficiary with a risk score of 1.000 is expected to have expenditures equivalent to a Medicare beneficiary selected at random from the PPO service area. Mean predicted expenditures are dominated by the FFS sample which accounts for 80 percent of Medicare enrollment in the PPO service area. The HMO comparison group represents the majority of the remainder with 1.9 million enrollees. HMO enrollment in the PPO service area is

higher than overall HMO enrollment in Medicare because the PPO service area is relatively urban[14]. Mean predicted expenditures for beneficiaries in the PPO service area are $6,696.

Predicted expenditures and risk scores are proxy measures for beneficiary health status. They are heavily influenced by a beneficiary's profile of serious diagnoses or acute medical events. The higher the predicted expenditures or risk score, the worse the health status of the beneficiary or population.

2.3 Data

For the cost impact and biased selection analyses we used data provided by CMS, including FFS claims, Medicare enrollment data, diagnoses used in Medicare capitation payment, CMS Monthly Payment Files, CMS Group Health Plan files, and risk sharing totals provided by CMS for the PPO Demonstration. We also gathered key information including county payment rates from the CMS website. Below we describe the data sources that were used in this report.

2.3.1 Diagnosis Codes

CMS collects diagnosis codes for all beneficiaries enrolled in Medicare, including those enrolled in health plans. Diagnosis codes for managed care encounters are collected by health plans and forwarded to CMS for the purpose of risk adjusting capitation payments. Diagnosis codes for FFS encounters are included in Medicare FFS claims. These diagnosis codes were made available to RTI by Fu Associates for all Medicare enrollees in our samples, including PPO Demonstration enrollees, as well as HMO and FFS enrollees in the PPO service area. We used diagnosis codes for the PPO sample to estimate counterfactual payments for the enrollees in the absence of the demonstration. In the biased selection analysis we use diagnosis codes collected during the 2003 calendar year to create expenditure predictions and risk scores for the PPO, HMO, and FFS comparison groups.

2.3.2 Claims Data for FFS Beneficiaries

RTI collected claims for a sample of FFS beneficiaries residing in the PPO Demonstration service area. Claims were abstracted from the 100 percent Medicare National Claims History (NCH) and Standard Analytic File (SAF) databases, including inpatient, outpatient, physician/supplier, home health, skilled nursing facility, and durable medical equipment claims components. Information was collected for 2003. Claims records contain diagnostic and expenditure information for all Medicare covered utilization for beneficiaries enrolled in original FFS Medicare. We limit the sample to those with Part A and Part B coverage to ensure that we capture all health care diagnoses and expenditures for these beneficiaries. Diagnoses are recorded as ICD-9 codes for inpatient, outpatient and Part B physician/supplier claims.

[14] See PPO Secondary Data Analysis Report (Pope, et al., 2004).

2.3.3 Medicare Enrollment Data

Enrollment, demographic, and residence location data for PPO, HMO, and FFS beneficiaries residing in the PPO Demonstration service area were obtained from the Medicare Enrollment Database (EDB), Denominator, and Group Health Plan files. Information was obtained for 2003 and some data for 2002 (prior enrollment status of 2003 PPO enrollees). These data were used directly in the analyses, for example to compare demographic characteristics among PPO, HMO, and FFS beneficiaries, and as inputs to expenditure prediction. Also, these data were used to draw and verify samples and to create the sampling and eligibility fraction weights for the analyses.

2.3.4 Monthly Medicare Health Plan Payment Files

CMS provided access to the Monthly Medicare Health Plan Payment Files for all 33 PPO Demonstration plans that participated in 2003. Monthly Payment Files contain records for each beneficiary and month that a payment was made to a PPO Demonstration plan in 2003. Payments are recorded as they occur, and adjustments are made throughout the payment year and beyond.

For each enrolled beneficiary in a Medicare health plan, the monthly payment file contains a record of payment made to the plan by CMS during the calendar year month. Separate payment files were created for each health plan and month. The record consists of the payment made and the information used to calculate the payment. For 2003, the data provided included demographic information such as age, sex, Medicaid, and long-term institutional status as well as the PIP-DCG category to which the beneficiary belonged. Payment adjustments were recorded during the month the adjusted payment was made. For example, a beneficiary who was incorrectly recorded as not enrolled in December 2003 may be found later to have been enrolled in December 2003. The capitation payment for this beneficiary for December 2003 could be recorded as an adjustment on the April 2004 monthly payment file, for example. We used payment files for 2003 and 2004 to accurately calculate total 2003 payments to PPOs, including adjustments made during calendar year 2004. PPO payments were also used to estimate counterfactual HMO payments.

2.3.5 County Payment Rates

We collected the 2003 county payment rates file from the CMS website. Historical capitation monthly base payment rates are maintained by CMS for both aged beneficiaries and disabled beneficiaries. These amounts were risk adjusted to identify actual payments to Medicare Health Plans. County payment files contain these rates for each county in the United States. In addition, files containing the 2003 99 percent FFS average expenditure for counties were maintained on the CMS website. The county payment rate files were used to estimate counterfactual capitated payments to PPO beneficiaries assuming they had been enrolled in an HMO during 2003.

2.3.6 PPO Demonstration Risk Sharing Reconciliation Amounts

One component of total Medicare payments to PPO Demonstration plans was risk sharing amounts. These amounts were paid in addition to the usual capitation payments. CMS provided us with a spreadsheet (see Table 6) that contained the risk sharing settlement amounts for each

PPO Demonstration plan that had been reconciled by the time this report was prepared (Fall 2006).[15]

2.4 Presentation of Results for Contract 15 and Non-Contract 15 Enrollees

In our analyses, we generated tables with and without enrollees of the Contract 15 PPO Demonstration contract. Contract 15 enrolled over half of the beneficiaries ever enrolled in the demonstration in 2003 and thus tends to dominate analyses of the PPO Demonstration. Contract 15 essentially replaced its earlier Medicare HMO product with its similar PPO Demonstration product (Greenwald et al., 2004). Most enrollees (48,504 enrollees) in the HMO transferred to the demonstration plan. Enrollees who moved from Contract 15's HMO to its PPO demonstration plan are referred to as "Contract 15 stayers" in this report. Because of its large size and the unique circumstances surrounding the Contract 15 demonstration product, combining Contract 15 stayers with other demonstration enrollees may provide a misleading picture of PPO enrollment dynamics.

[15] Risk sharing for one demonstration organization had not been reconciled at the time this report was prepared. While the final risk-sharing amount is not known, a net loss is anticipated as a result of the outstanding reconciliation.

SECTION 3
RESULTS

This section describes our results. We begin with the findings of the cost impact analysis and follow with the findings from the biased selection analysis.

3.1 Cost Impact Results

Table 1 presents cost impact results for all PPO Demonstration plans. Payments from CMS to PPO Demonstration plans in 2003 totaled $482,470,996, including capitation payments for 89,334 PPO enrollees and risk sharing payments to 19 participating PPO plans. We estimated that PPO enrollees would have cost CMS $441,620,391 in the absence of the demonstration. Thus, the PPO Demonstration resulted in an estimated $40,850,605 in higher payments by Medicare in 2003. These payments were made up of $6,779,686 in risk sharing payments and $34,070,919 in extra capitation payments. The extra amount represented higher payments of $457 per PPO enrollee in 2003, an increase of 9.3 percent over the costs CMS would have incurred for these beneficiaries in the absence of the demonstration.

Table 1 also shows actual (other than risk sharing) payments and estimated payments for 2003 PPO enrollees by their prior enrollment status. [16] Among 2003 PPO enrollees, 64,983 were enrolled in an HMO at the end of 2002.[17] These beneficiaries were estimated to have incurred an extra $21,615,515 in CMS expenditures during 2003 because of the PPO Demonstration, or an additional $333 per beneficiary. These expenditures were more than half of the total extra non-risk sharing payments made by CMS, but only represented a 5.7 percent increase above what CMS would have incurred absent the demonstration. These extra payments arose from the 99 percent of FFS county payment rate paid under the demonstration, which was higher than the usual Medicare capitation rate in some counties.

PPO enrollees who were in FFS prior to 2003 incurred estimated extra payments per beneficiary (other than risk sharing) of $696 under the demonstration. These expenditures represented a 25.3 percent increase in payments for these beneficiaries over what Medicare would have paid for them had they remained in FFS Medicare, a much larger increase than for prior HMO enrollees. While large on a per capita basis, this resulted in only $12,127,312 in total extra payments because there were only 17,419 PPO beneficiaries who had been enrolled in original FFS Medicare at the end of 2002. Higher demonstration payments for prior FFS enrollees arose from favorable selection of healthier beneficiaries into PPOs (see Section 3.2), and MA capitation rates that were higher than average FFS expenditures in some counties.

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16 Risk sharing payments were made on a plan aggregate basis and cannot be allocated below the plan level.

17 As stated earlier, in this report we use the term “HMO” loosely to include all enrollees in Medicare health plans, most of whom were in fact enrolled in HMOs. Also, note that the Contract 15 demonstration PPO plan contained 48,504 enrollees from its prior HMO plan who were rolled into its demonstration PPO plan in 2003.

Table 1
Cost impact of the PPO demonstration, 2003

	Enrollees[1]	Actual demonstration payments[2]	Estimated payments without demonstration[3]	Demonstration Cost Impact (Actual–Estimated) Total	Per PPO enrollee	Percent estimated payments without demonstration[4]
TOTAL	**89,334**	**$ 482,470,996**	**$441,620,391**	**$40,850,605**	**$457**	**9.3%**
Risk Sharing[5]	89,334	6,779,686	0	6,779,686	76	--
Non-Risk Sharing[6]	89,334	475,691,310	441,620,391	34,070,919	381	7.7%
Prior Enrollment Status[7]						
Prior Year FFS	17,419	60,046,849	47,919,537	12,127,312	696	25.3%
Prior Year HMO	64,983	400,341,568	378,726,053	21,615,515	333	5.7%
New Medicare Enrollee	6,932	15,302,893	14,974,801	328,092	47	2.2%

NOTES

[1] Includes Medicare beneficiaries enrolled in a PPO demonstration plan for at least 1 month in 2003.

[2] Demonstration payments include all capitation payments to PPO demonstration plans and total reconciliation payments made as part of the risk sharing arrangement.

[3] Estimated Medicare payments on behalf of PPO enrollees to managed care organizations or FFS providers in the absence of the demonstration. Risk sharing payments would not have occurred in the absence of the demonstration and are thus $0.

[4] Total Demonstration Cost Impact divided by estimated payments without demonstration.

[5] Risk Sharing amount does not include amount for one insurer, representing three demonstration contracts. This insurer's risk sharing amount was not finalized at the time this report was prepared.

[6] Non-Risk Sharing amount includes actual payments to PPO demonstration plans or estimated payments to health plans and FFS providers in the absence of the demonstration.

[7] Includes only non-risk sharing payments.

SOURCE: RTI International analysis of 2003 Medicare claims, enrollment, reconciliation, and payment files.

PPO new Medicare enrollees saw the lowest extra costs at only $47 per beneficiary, or 2.2 percent higher than without the demonstration. New Medicare enrollees may not have been enrolled in a PPO for very many months in 2003. This, together with their relatively small numbers, limited their total cost impact.[18]

Tables 2 and 3, which have the same table shell as Table 1, depict the cost impact of the demonstration for non-Contract 15 and Contract 15 PPO enrollees, respectively. Although Contract 15 comprised 58 percent of PPO Demonstration enrollment, it accounted for less than half of the demonstration's cost impact. Three factors mostly accounted for this. First, and most important, almost all of Contract 15's enrollment (94 percent) was previously enrolled in Contract 15's HMO. The average cost impact of the demonstration was much lower for prior HMO enrollees than for prior FFS enrollees. Second, the estimated per capita cost impact for prior FFS enrollees was lower for Contract 15 (17.3 percent) than for non-Contract 15 (26.6 percent) PPO enrollees. Third, Contract 15 did not participate in risk sharing in 2003, and thus received no risk sharing payments. As a percentage of payments absent the demonstration, we estimated that Medicare paid 5.9 percent more for Contract 15 PPO enrollees, but 17.4 percent more for non-Contract 15 PPO enrollees.

Estimated demonstration cost impact on Medicare payments by PPO contract is shown in **Table 4**. Extra costs per beneficiary resulting from the PPO Demonstration ranged from $1,427 for Contract 4 and Contract 26, to -$1,041 (savings to Medicare from the demonstration) for Contract 5. Contract 5 had only 75 enrollees in 2003. All but 5 of 33 health plans incurred extra costs for Medicare by enrolling beneficiaries under the PPO Demonstration. The five plans that saved Medicare money enrolled only 1,524 beneficiaries, or 1.7 percent of the demonstration's total enrollment. Many of the PPO contracts increased Medicare payments in excess of 20 percent. This large increase in Medicare payments was the result of the reconciliation of risk sharing payments or the large percentage of Medicare beneficiaries from fee-for-service enrolling in these PPO contracts.

The per capita and percentage cost impact by contract was highly correlated with the percentage of a contract's enrollees who were previously enrolled in FFS versus HMO, which is shown in **Table 5**. Contracts such as Contract 6 that derived a high percentage of their enrollees from FFS tended to have large per capita and percentage cost impacts. Conversely, contracts such as Contract 14 that drew a large proportion of their enrollment from HMOs had smaller per capita and percentage cost impacts. This result is consistent with the greater cost impact of the demonstration on prior FFS than on prior HMO enrollees shown in Table 1.

[18] In addition, we were able to use only a demographic expenditure prediction model for many new Medicare enrollees assigned to FFS in the absence of the demonstration (see Section 2), limiting our ability to capture any favorable selection in PPO enrollment of new Medicare enrollees.

Table 2
Cost impact of the PPO demonstration, 2003, excluding Contract 15[1]

	Enrollees[2]	Actual demonstration payments[3]	Estimated payments without demonstration[4]	Demonstration Cost Impact (Actual–Estimated)		
				Total	Per PPO Enrollee	Percent estimated payments without demonstration[5]
TOTAL	**37,913**	**$ 149,204,532**	**$ 127,064,610**	**$ 22,139,922**	**$ 584**	**17.4%**
Risk Sharing[6]	37,913	6,779,686	0	6,779,686	179	--
Non-Risk Sharing[7]	37,913	142,424,846	127,064,610	15,360,236	405	12.1%
Prior Enrollment Status[8]						
Prior Year FFS	15,607	52,292,084	41,306,838	10,985,246	704	26.6%
Prior Year HMO	16,479	77,593,709	73,444,357	4,149,352	252	5.6%
New Medicare Enrollee	5,827	12,539,053	12,313,415	225,638	39	1.8%

NOTES
1 Beneficiaries enrolled in the Contract 15 plan are excluded from this table.
2 Includes Medicare beneficiaries enrolled in a PPO demonstration plan for at least one month in 2003.
3 Demonstration payments includes all capitation payments to PPO demonstration plans and total reconciliation payments made as part of the risk sharing arrangement.
4 Estimated Medicare payments on behalf of PPO enrollees to managed care organizations or FFS providers in the absence of the demonstration. Risk sharing payments would not have occurred in the absence of the demonstration and are thus $0.
5 Total Demonstration Cost Impact divided by estimated payments without demonstration.
6 Risk Sharing amount does not include amount for one insurer, representing three demonstration contracts. This insurer's risk sharing amount was not finalized at the time this report was prepared.
7 Non-Risk Sharing amount includes actual payments to PPO demonstration plans or estimated payments to health plans and FFS providers in the absence of the demonstration.
8 Includes only non-risk sharing payments.

SOURCE: RTI International analysis of 2003 Medicare claims, enrollment, reconciliation, and payment files.

Table 3
Cost impact of the PPO demonstration, 2003, including only Contract 15[1]

	Enrollees[2]	Actual demonstration payments[3]	Estimated payments without demonstration[4]	Demonstration Cost Impact (Actual–Estimated)		
				Total	Per PPO enrollee	Percent estimated payments without demonstration[5]
TOTAL	**51,421**	**$ 333,266,464**	**$ 314,555,781**	**$ 18,710,683**	**$ 364**	**5.9%**
Risk Sharing	51,421	0	0	0	0	--
Non-Risk Sharing[6]	51,421	333,266,464	314,555,781	18,710,683	364	5.9%
Prior Enrollment Status						
Prior Year FFS	1,812	7,754,765	6,612,699	1,142,066	630	17.3%
Prior Year HMO	48,504	322,747,859	305,281,696	17,466,163	360	5.7%
New Medicare Enrollee	1,105	2,763,840	2,661,387	102,454	93	3.8%

NOTES
[1] Only beneficiaries enrolled in PPO Demonstration Contract 15 are included in this table.
[2] Includes Medicare beneficiaries enrolled in the Contract 15 demonstration plan for at least one month in 2003.
[3] Demonstration payments includes all capitation payments to the Contract 15 demonstration plan.
[4] Estimated Medicare payments on behalf of Contract 15 enrollees in the absence of the demonstration.
[5] Total Demonstration Cost Impact divided by estimated payments without demonstration.
[6] Non-Risk Sharing amount includes actual payments or estimated payments to Contract 15.

SOURCE: RTI International analysis of 2003 Medicare claims, enrollment, and payment files.

Table 4
Cost impact of the PPO demonstration, 2003, by contract

PPO contract	State(s) of PPO service area	Enrollees	CMS Actual Payments to PPOs: Capitation	CMS Actual Payments to PPOs: Risk sharing	Estimated payments without demonstration[1]	Demonstration Cost Impact (Actual - Estimated): Total	Demonstration Cost Impact (Actual - Estimated): Per enrollee	Percent estimated cost without demonstration[2]
TOTAL	**--**	**89,334**	**$ 475,691,310**	**$ 6,779,686**	**$ 441,620,391**	**$ 40,850,605**	**$ 457**	**9.3%**
1	Alabama	921	2,330,485	28,413	2,034,768	324,129	352	15.9
2	Alabama	49	162,234	41,426	157,240	46,421	947	29.5
3	Arizona	595	1,723,818	38,491	1,358,420	403,888	679	29.7
4	Arizona	1,514	4,575,397	1,749,159	4,163,745	2,160,810	1,427	51.9
5[3]	Florida	75	254,568	--	332,673	(78,105)	(1,041)	-23.5
6	Illinois	2,563	8,351,379	(426,674)	6,099,061	1,825,644	712	29.9
7	Illinois, Missouri	516	1,598,433	(191,925)	1,497,222	(90,713)	(176)	-6.1
8	Illinois, Missouri	2,744	9,069,620	2,023,598	8,608,624	2,484,595	905	28.9
9	Indiana	218	491,522	--	393,942	97,580	448	24.8
10	Kentucky	22	15,632	--	12,669	2,963	135	23.4
11[3]	Louisiana	334	1,444,675	--	1,460,254	(15,578)	(47)	-1.1
12[4]	Maryland	3,449	14,348,456	--	12,630,078	1,718,378	498	13.6
13	Nevada	79	169,590	7,218	167,148	9,660	122	5.8
14[4]	New Jersey	7,099	39,583,190	--	36,243,097	3,340,093	471	9.2
15[3]	New Jersey	51,421	333,266,464	--	314,555,781	18,710,683	364	5.9
16	New York	3,065	7,733,418	(294,781)	6,395,323	1,043,314	340	16.3
17	New York	264	723,211	(60,470)	494,868	167,872	636	33.9

(Continued)

Table 4 (continued)
Cost impact of the PPO demonstration, 2003, by contract

PPO contract	State(s) of PPO service area	Enrollees	CMS Actual Payments to PPOs		Estimated payments without demonstration[1]	Demonstration Cost Impact (Actual-Estimated)		Percent estimated Cost without demonstration[2]
			Capitation	Risk sharing		Total	Per enrollee	
18	New York	47	169,666	--	182,226	(12,560)	(267)	-6.9
19	New York	316	603,985	54,192	496,914	161,263	510	32.5
20	North Carolina	1,546	4,192,607	278,761	3,317,843	1,153,525	746	34.8
21	Ohio, West Virginia	681	1,900,504	(54,549)	1,681,399	164,556	242	9.8%
22	Ohio	930	3,376,794	733,727	3,206,523	903,998	972	28.2
23	Ohio	195	566,984	104,812	490,466	181,330	930	37.0
24	Ohio	109	82,197	--	64,158	18,039	165	28.1
25	Oregon, Washington	424	1,019,838	29,165	1,016,990	32,013	76	3.1%
26[3]	Pennsylvania	451	1,602,581	--	959,020	643,561	1,427	67.1
27[4]	Pennsylvania	3,495	15,019,405	--	14,130,346	889,060	254	6.3
28	Pennsylvania	5	9,038	--	8,661	377	75	4.4
29	Rhode Island	772	1,471,444	169,893	1,436,489	204,847	265	14.3
30[3]	Tennessee	30	77,917	--	65,103	12,814	427	19.7
31	Tennessee	552	1,987,644	--	1,995,225	(7,580)	(14)	-0.4
32	Florida	930	3,167,762	778,519	2,936,373	1,009,908	1,086	34.4
33	Florida	3,923	14,600,851	1,770,712	13,027,743	3,343,820	852	25.7

NOTES
[1] Estimated payments to managed care organizations or FFS providers on behalf of PPO enrollees in the absence of the demonstration.
[2] Total Demonstration Cost Impact divided by estimated payments without demonstration.
[3] Indicates that plan did not participate in risk sharing during 2003.
[4] Risk sharing amounts for this contract were not available at the time this report was prepared.

SOURCE: RTI International analysis of 2003 Medicare claims, enrollment, and payment files..

Table 5
PPO demonstration 2003 enrollment by prior enrollment status, by contract

PPO contract	State(s) of PPO service area	Overall		New Medicare Enrollees		Prior Year FFS		Prior Year HMO	
		Enrollees	Percent	Enrollees	Percent	Enrollees	Percent	Enrollees	Percent
Total	--	**89,334**	**100.0%**	**6,932**	**7.8%**	**17,419**	**19.5%**	**64,983**	**72.7%**
1	Alabama	921	100.0	185	20.1	550	59.7	186	20.2
2	Alabama	49	100.0	9	18.4	9	18.4	31	63.3
3	Arizona	595	100.0	125	21.0	225	37.8	245	41.2
4	Arizona	1,514	100.0	359	23.7	612	40.4	543	35.9
5	Florida	75	100.0	14	18.7	25	33.3	36	48.0
6	Illinois	2,563	100.0	428	16.7	1,801	70.3	334	13.0
7	Illinois, Missouri	516	100.0	76	14.7	102	19.8	338	65.5
8	Illinois, Missouri	2,744	100.0	387	14.1	633	23.1	1,724	62.8
9	Indiana	218	100.0	51	23.4	122	56.0	45	20.6
10	Kentucky	22	100.0	4	18.2	6	27.3	12	54.5
11	Louisiana	334	100.0	48	14.4	202	60.5	84	25.1
12	Maryland	3,449	100.0	324	9.4	2835	82.2	290	8.4
13	Nevada	79	100.0	16	20.3	27	34.2	36	45.6
14	New Jersey	7,099	100.0	773	10.9	1,161	16.4	5,165	72.8
15	New Jersey	51,421	100.0	1105	2.1	1,812	3.5	48,504	94.3
16	New York	3,065	100.0	637	20.8	1,341	43.8	1,087	35.5
17	New York	264	100.0	60	22.7	189	71.6	15	5.7

(Continued)

Table 5 (continued)
PPO demonstration 2003 enrollment by prior enrollment status, by contract

PPO contract	State(s) of PPO service area	Overall		New Medicare enrollees		Prior Year FFS		Prior Year HMO	
		Enrollees	Percent	Enrollees	Percent	Enrollees	Percent	Enrollees	Percent
18	New York	47	100.0%	8	17.0 %	35	74.5%	4	8.5%
19	New York	316	100.0	81	25.6	206	65.2	29	9.2
20	North Carolina	1,546	100.0	290	18.8	776	50.2	480	31.0
21	Ohio, West Virginia	681	100.0	6	0.9	521	76.5	154	22.6
22	Ohio	930	100.0	122	13.1	208	22.4	600	64.5
23	Ohio	195	100.0	30	15.4	78	40.0	87	44.6
24	Ohio	109	100.0	36	33.0	39	35.8	34	31.2
25	Oregon, Washington	424	100.0	115	27.1	128	30.2	181	42.7
26	Pennsylvania	451	100.0	106	23.5	303	67.2	42	9.3
27	Pennsylvania	3,495	100.0	516	14.8	1,400	40.1	1,579	45.2
28	Pennsylvania	5	100.0	1	20.0		0.0	4	80.0
29	Rhode Island	772	100.0	164	21.2	129	16.7	479	62.0
30	Tennessee	30	100.0	11	36.7	18	60.0	1	3.3
31	Tennessee	552	100.0	98	17.8	271	49.1	183	33.2
32	Florida	930	100.0	143	15.4	220	23.7	567	61.0
33	Florida	3,923	100.0	604	15.4	1,435	36.6	1,884	48.0

SOURCE: RTI analysis of CMS enrollment files.

Table 6 analyzes CMS 2003 risk sharing payments to PPO Demonstration contracts. Five of the demonstration PPO contracts did not participate in risk sharing during 2003. In addition, the three PPO Demonstration contracts of one insurer did not reconcile their 2003 risk sharing payments by the time this report was published.[19] Our results do not include these plans that have not reported for 2003 yet.

Risk sharing transactions included payments from CMS to 14 PPO plans of $7,808,084 and payments from five PPO plans to CMS of $1,028,398. On net, CMS paid $6,779,686 to PPO plans. This represented $295 per PPO Demonstration enrollee enrolled in a demonstration contract with a risk sharing arrangement with CMS in 2003 and for which risk sharing amounts were available for this report, and 8.8 percent of total 2003 CMS payments to these demonstration contracts. The $6.8 million in net risk sharing payments accounted for 16.6 percent of the $40.9 million extra costs of the demonstration.

The largest CMS risk sharing payments, $2.0 million, went to Contract 8. Three contracts--Contracts 4, 8, and 33--received $5.5 million of the total $6.8 million in net risk sharing payments, or 82 percent. Thus, risk sharing payments were concentrated in a few contracts. Also, risk sharing payments to some contracts were quite significant on a per capita and a percentage basis. For example, the largest per enrollee risk sharing payments, $1,155, went to Contract 4 and accounted for 27.7 percent of total CMS payments to that contract. The largest plan risk sharing payments to CMS were made by Contract 6, and amounted to $426,674. On a per enrollee basis, the largest risk sharing payments to CMS, $372, were made by Contract 7.

The substantial large positive net risk sharing payments from CMS to PPO Demonstration plans are surprising in light of the positive cost impact of the demonstration (CMS paid more for demonstration enrollees than it would have in the absence of the demonstration) and the favorable selection of FFS enrollees experienced by demonstration plans (discussed in the next section). One factor that may have contributed to positive risk sharing payments was that risk sharing was not mandatory. Plans expecting a favorable risk selection of beneficiaries may have chosen not to participate in risk sharing. However, only 5 of 33 plans did not participate. Also, it is possible that our findings could change when results are available for all participating plans for 2003. A final factor could be the method CMS used to determine the medical loss ratio target that was the basis of risk sharing. CMS and the PPO plans may have negotiated the target assuming a neutral PPO selection of enrollees from HMOs, or that PPO enrollees would “look like” HMO enrollees in the same area. As we show in the next section, demonstration plans received an adverse selection of HMO enrollees, which could have contributed to the positive net risk sharing payments. Also, Table 10 (discussed in the next section) shows that the PPO enrollee average risk score was considerably higher than the average area HMO enrollee risk score for the three PPO contracts—4, 8, and 33—that received the bulk of the risk sharing payments.

[19] An additional five demonstration PPO plans deferred the 2003 reconciliation.

Table 6
PPO demonstration 2003 risk sharing payments, by contract

PPO contract	State(s) of PPO service area	Enrollees	Net CMS payments[1]	Net payments per enrollee	Net Payments as percent of total payments to contract
TOTAL[4]	---	**22,980**	**$6,779,686**	**$ 295**	**8.8%**
1	Alabama	921	28,413	31	1.2
2	Alabama	49	41,426	845	20.3
3	Arizona	595	38,491	65	2.2
4	Arizona	1,514	1,749,159	1,155	27.7
5[2]	Florida	75	--	--	--
6	Illinois	2,563	(426,674)	(166)	-5.4
7	Illinois, Missouri	516	(191,925)	(372)	-13.6
8	Illinois, Missouri	2,744	2,023,598	737	18.2
9	Indiana	218	--	--	0.0
10	Kentucky	22	--	--	0.0
11[2]	Louisiana	334	--	--	--
12[3]	Maryland	3,449	--	--	--
13	Nevada	79	7,218	91	4.1
14[3]	New Jersey	7,099	--	--	--
15[2]	New Jersey	51,421	--	--	--
16	New York	3,065	(294,781)	(96)	-4.0

(continued)

Table 6 (continued)
PPO demonstration 2003 risk sharing payments, by contract

PPO contract	State(s) of PPO service area	Enrollees	Net CMS payments[1]	Net payments per enrollee	Net Payments as percent of total payments to contract
17	New York	264	(60,470)	(229)	-9.1%
18	New York	47	--	--	0.0
19	New York	316	54,192	171	8.2
20	North Carolina	1,546	278,761	180	6.2
21	Ohio, West Virginia	681	(54,549)	(80)	-3.0
22	Ohio	930	733,727	789	17.8
23	Ohio	195	104,812	537	15.6
24	Ohio	109	--	--	0.0
25	Oregon, Washington	424	29,165	69	2.8
26[2]	Pennsylvania	451	--	--	--
27[3]	Pennsylvania	3,495	--	--	--
28	Pennsylvania	5	--	--	0.0
29	Rhode Island	772	169,893	220	10.4
30[2]	Tennessee	30	--	--	--
31	Tennessee	552	--	--	0.0
32	Florida	930	778,519	837	19.7
33	Florida	3,923	1,770,712	451	10.8

NOTES

[1] Negative payments indicate a Medicare PPO paid CMS during 2003, positive payments indicate that CMS paid the PPO during 2003.
[2] Indicates that plan did not participate in risk sharing during 2003.
[3] Risk sharing amounts were not available at the time this report was prepared.
[4] Includes only contracts with a risk sharing arrangement with CMS in 2003 and for which risk sharing amounts were available for this report.

SOURCE: RTI International analysis of 2003 Medicare claims, enrollment, reconciliation, and payment files

3.2 Biased Selection Results

Our biased selection analysis compared PPO Demonstration enrollees to HMO and FFS enrollees within the PPO Demonstration service area during 2003. We compared enrollees on demographic characteristics, predicted expenditures, and risk scores.

Table 7 depicts a demographic comparison of each sample: PPO, HMO, and FFS. There is little difference in the male/female proportions across the samples. PPO Medicare/Medicaid dual-eligible enrollment (2.5 percent) was distinctly lower than HMO (7.8 percent), and much lower than the FFS Medicaid proportion (16.0 percent). PPOs did not appeal to poorer beneficiaries, presumably in large part because of their higher premiums. PPO elderly enrollees were younger than the FFS elderly and slightly younger than the HMO elderly. Almost half of PPO enrollment (49.4 percent) was in the youngest elderly age bracket of 65 to 74 year-olds compared to 38.7 percent for FFS and 47.6 percent for HMO. Disabled (under age 65) enrollment in PPOs was a slightly higher percentage of total enrollment (13.0 percent) than in HMOs (10.6 percent), but lower than FFS disabled enrollment (17.4 percent). In sum, compared to FFS, PPO enrollees were more likely to be non-Medicaid, non-disabled, and younger among the elderly. PPO enrollees were more similar to HMO enrollees than FFS beneficiaries. But they were more likely to be non-Medicaid, disabled, and younger elderly than HMO enrollees.

Table 8 compares predicted expenditures and risk scores across PPO, HMO, and FFS populations. PPO beneficiaries (risk score = 0.882) were notably healthier than the average beneficiary in FFS Medicare (risk score = 1.030). PPO beneficiaries were predicted to cost about $1,000 less on average than FFS beneficiaries (if the PPO enrollees were in FFS Medicare). PPO enrollees have about the same average risk score and predicted expenditures as HMO enrollees. Hence, PPOs experienced about the same degree of favorable selection relative to FFS as HMOs did. Risk scores and predicted expenditures for Contract 15 and non-Contract 15 PPO enrollees did not differ significantly. PPO enrollees were substantially more expensive than recent (2003) enrollees in HMOs, who enrolled during the same time the (start-up) PPO Demonstration plans operated. The PPO Demonstration plans drew an enrollee population more similar to the entire HMO population than to recent HMO enrollees.

Table 9 shows predicted expenditures and risk scores for 2003 PPO enrollees only, broken down by their prior year enrollment (HMO, FFS, or not in Medicare at the end of 2002), and Contract 15/non-Contract 15 enrollment. Prior year enrollment for this table was assigned in the same manner as for the cost impact analysis.[20] PPO enrollees previously in an HMO had much higher risk scores (0.916) than either prior FFS (0.724) or new Medicare enrollees (0.692). Results for predicted expenditures were similar.

[20] In Table 9, the average of the prior HMO, prior FFS, and new Medicare enrollee risk scores weighted by the number of enrollees does not equal the overall PPO enrollee risk score. This is because the scores are weighted by months of PPO enrollment, and PPO months per enrollee are smaller for prior FFS and especially for new Medicare enrollees than for prior HMO enrollees.

Table 7
Demographic distribution of PPO, HMO, and FFS enrollees in the PPO demonstration service area, 2003

	TOTAL		PPO		HMO		FFS[1]	
TOTAL	**9,871,640**	**100.0%**	**89,334**	**100.0%**	**1,881,960**	**100.0%**	**7,900,346**	**100.0%**
Male	4,122,183	41.8	37,811	42.3	790,248	42.0	3,294,124	41.7
Female	5,749,457	58.2	51,523	57.7	1,091,712	58.0	4,606,222	58.3
Medicaid	1,414,461	14.3	2,234	2.5	146,237	7.8	1,265,992	16.0
Female, 0-64	763,072	7.7	6,632	7.4	102,954	5.5	653,486	8.3
Female, 65-74	2,249,975	22.8	24,955	27.9	504,286	26.8	1,720,734	21.8
Female, 75-84	1,957,618	19.8	15,911	17.8	367,228	19.5	1,574,479	19.9
Female, 85+	778,797	7.9	4,030	4.5	117,244	6.2	657,523	8.3
Male, 0-64	820,528	8.3	5,045	5.6	96,114	5.1	719,369	9.1
Male, 65-74	1,743,288	17.7	19,180	21.5	390,678	20.8	1,333,430	16.9
Male, 75-84	1,241,852	12.6	11,351	12.7	248,103	13.2	982,399	12.4
Male, 85+	316,510	3.2	2,230	2.5	55,353	2.9	258,927	3.3

NOTES
[1] Based on a sample of FFS enrollees (see text). Weighted to represent actual count of Medicare FFS beneficiaries in the PPO service area.

SOURCE: RTI International analysis of CMS claims and enrollment data.

Table 8
Predicted expenditures and risk scores of PPO, HMO, and FFS enrollees in the PPO demonstration service area, 2003

	Enrollees	Predicted expenditures	Risk score
Total Sample	**9,871,640**	**$6,696**	**1.000**
PPO	89,334	5,905	0.882
Non-Contract 15	37,913	6,045	0.903
Contract 15	51,421	5,827	0.870
HMO	1,881,960	5,825	0.870
Recent HMO enrollees[1]	161,013	4,596	0.686
FFS	7,900,346	6,899	1.030

NOTES
[1] Recent HMO enrollees are beneficiaries who enrolled in an HMO on or after January 1, 2003.

SOURCE: RTI International analysis of CMS claims and enrollment data.

Table 9
Predicted expenditures and risk scores of 2003
PPO demonstration enrollees by prior enrollment and Contract 15/Non-Contract 15 status

	Enrollees	Predicted expenditures	Risk score
All PPO Beneficiaries	**89,334**	**$5,905**	**0.882**
Non-Contract 15	37,913	6,045	0.903
Contract 15	51,421	5,827	0.870
New Medicare Enrollees	6,932	4,631	0.692
Non-Contract 15	5,827	4,691	0.701
Contract 15	1,105	4,359	0.651
Prior Year HMO	64,983	6,132	0.916
Non-Contract 15	16,479	6,907	1.031
Contract 15	48,504	5,871	0.877
Prior Year FFS	17,419	4,851	0.724
Non-Contract 15	15,607	4,853	0.725
Contract 15	1,812	4,837	0.722

SOURCE: RTI International analysis of CMS claims and enrollment data.

Excluding the Contract 15 HMO to PPO rollover, PPO plans drew an even less favorable selection from HMOs (prior HMO risk score = 1.031 for non-Contract 15 plans). Comparing to the risk score of the PPO service area HMO population (0.870 from Table 8[21]), non-Contract 15 plans drew an adverse selection from HMO enrollees. PPO enrollees drawn from FFS had a much lower risk score (0.724) than the service area FFS population (1.030 from Table 8). PPOs were attracting much healthier than average FFS enrollees.

In short, demonstration PPOs drew an adverse selection from HMOs (excluding the Contract 15 rollover), but a highly favorable selection from FFS. Consequently, although the service area FFS population was significantly sicker than the HMO population on average, PPO enrollees drawn from HMO were much sicker than PPO enrollees drawn from FFS (or PPO new Medicare enrollees). We can hypothesize that sicker HMO enrollees using more medical services may have been disproportionately attracted by the greater freedom of provider choice in PPOs versus HMOs, whereas only healthier FFS beneficiaries using fewer services were willing to accept the greater constraints on provider choice in PPOs versus FFS.

Table 10 show risk scores and service area enrollment for PPO, HMO, and FFS enrollees by individual PPO Demonstration contract.[22] Average risk scores for small numbers of PPO enrollees were subject to substantial random variation. But even among PPO contracts with larger numbers of enrollees, there were deviations from the overall pattern identified in Table 8 of average PPO risk scores similar to average HMO scores, and considerably lower than average FFS scores. For example, Contract 33 had 3,923 enrollees with an average risk score of 0.964. This was similar to the average FFS risk score in the service area (0.989) and much higher than the average HMO score (0.779). Enrollees in this PPO plan were more similar in health status to FFS beneficiaries than to HMO enrollees. In contrast, in Contracts 16 and 27, the PPO average risk score was much lower than both the HMO and FFS service area averages. PPO plans that drew a higher percentage of their enrollees from FFS or new Medicare enrollees tended to have lower average risk scores than plans that drew more enrollees from HMOs (compare Tables 5 and 10). This is consistent with the overall finding reported above of a favorable PPO selection from FFS but an adverse selection from HMOs.

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21 The service area HMO risk score includes HMO enrollees in the Contract 15 service area. But Table 10 (discussed below) shows that they comprised only 2.5 percent of PPO combined service area HMO enrollees and had an average risk score of 0.952. Thus, the overall service area HMO risk score of 0.870 is a roughly accurate representation of the average risk score of HMO enrollees in the non-Contract 15 combined PPO service areas.

22 The very high average "HMO" risk score for Contract 12 is due to a small plan with larger than usual proportions of end-stage renal disease and HIV/AIDS enrollees.

Table 10

Risk scores and enrollment counts of PPO, HMO, and FFS enrollees in the PPO demonstration service area, 2003, by contract

		Risk Score				Enrollees			
PPO contract	State(s) of PPO Service Area	Total	PPO	HMO	FFS	Total	PPO	HMO	FFS
TOTAL	**--**	**1.000**	**0.882**	**0.870**	**1.030**	**9,871,640**	**89,334**	**1,881,960**	**7,900,346**
1	Alabama	0.936	0.678	0.899	0.949	141,057	921	36,017	104,119
2	Alabama	0.909	1.059	0.771	0.941	57,651	49	12,844	44,758
3	Arizona	0.868	0.704	0.865	0.869	533,112	595	210,267	322,250
4	Arizona	0.871	0.994	0.865	0.873	613,431	1,514	211,467	400,450
5	Florida	0.981	1.270	0.794	1.031	189,499	75	42,734	146,690
6	Illinois	0.864	0.758	0.895	0.864	138,051	2,563	5,710	129,778
7	Illinois, Missouri	0.986	0.730	0.846	1.031	329,174	516	81,845	246,813
8	Illinois, Missouri	0.982	0.954	0.840	1.027	357,923	2,744	87,987	267,192
9	Indiana	0.896	0.763	0.720	0.896	80,965	218	105	80,642
10	Kentucky	1.016	0.454	0.848	1.035	39,177	22	3,928	35,227
11	Louisiana	0.994	1.055	0.823	1.080	151,612	334	52,160	99,118
12	Maryland	1.089	0.832	1.865	1.083	295,361	3,449	3,812	288,100
13	Nevada	1.015	0.786	0.791	1.072	131,494	79	28,038	103,377
14	New Jersey	1.135	1.050	0.929	1.144	736,023	7,099	31,020	697,904
15	New Jersey	1.113	0.870	0.952	1.131	1,142,075	51,421	47,317	1,043,337
16	New York	1.104	0.734	0.924	1.161	981,018	3,065	244,541	733,412
17	New York	0.910	0.689	0.797	0.947	418,250	264	107,450	310,536
18	New York	1.116	0.815	0.926	1.182	812,170	47	220,399	591,724
19	New York	1.116	0.670	0.926	1.182	812,439	316	220,399	591,724
20	North Carolina	0.913	0.720	0.766	0.929	344,080	1,546	35,541	306,993
21	Ohio, West Virginia	1.153	0.985	0.961	1.185	20,790	681	2,691	17,418
22	Ohio	0.971	1.002	0.819	1.003	165,052	930	29,417	134,705
23	Ohio	1.127	0.937	0.965	1.160	247,587	195	43,517	203,875
24	Ohio	0.967	0.719	0.859	0.989	303,635	109	52,022	251,504
25	Oregon, Washington	0.782	0.611	0.737	0.810	357,668	424	138,191	219,053
26	Pennsylvania	1.058	0.600	0.970	1.111	604,927	451	231,202	373,274
27	Pennsylvania	1.061	0.848	0.997	1.082	337,570	3,495	76,180	257,895
28	Pennsylvania	1.118	0.487	1.006	1.197	225,628	5	95,162	130,461
9	Rhode Island	0.986	0.848	0.883	1.052	137,449	772	53,613	83,064
30	Tennessee	0.929	0.724	0.790	0.948	231,541	30	28,929	202,582
31	Tennessee	0.958	0.874	0.787	0.992	155,005	552	27,029	127,424
32	Florida	1.030	1.091	0.872	1.118	482,842	930	181,494	300,418
33	Florida	0.948	0.964	0.779	0.989	565,811	3,923	119,135	442,753

SOURCE: RTI International analysis of CMS claims and enrollment data.

SECTION 4
CONCLUSION

We estimated that the Medicare program paid more for the 89,334 beneficiaries enrolled in PPO Demonstration plans in 2003 than it would have paid in the absence of the demonstration. The total estimated cost impact was approximately $41 million. This amounted to $457 per PPO enrollee, and 9.3 percent of estimated expenditures without the demonstration.

Extra expenditures under the demonstration were the result of the design of the demonstration, the characteristics of the beneficiaries who chose to enroll in the demonstration, and the design of the Medicare program. Four factors accounted for the higher expenditures under the demonstration:

1. The higher of the 99 percent of FFS per capita expenditures payment rate or the standard Medicare capitation rate paid to demonstration plans.

2. Demonstration plans were offered risk sharing with Medicare, which was not available in the regular Medicare program. Net Medicare risk sharing payments to plans were positive.

3. Demonstration plans enrolled a favorable health status selection of beneficiaries previously enrolled in the original FFS program. Capitation payments under the demonstration were greater than estimated FFS expenditures.

4. The usual Medicare capitation payment rate was higher than average FFS per capita expenditures in some counties. This factor—which operated for all Medicare capitated plans, not just demonstration plans—increased Medicare expenditures whenever a FFS beneficiary enrolled in a capitated plan, even with a neutral health status risk selection.

Although expenditures were higher under the PPO Demonstration, the demonstration may have had offsetting benefits that justified higher expenditures in the eyes of policymakers. A major stated goal of the demonstration was to expand the plan choices available to Medicare beneficiaries, particularly the PPO plan type that is popular in the private sector. Higher payments under the demonstration may have induced entry of PPO plans. The demonstration did in fact make PPO plans available to approximately one-quarter of Medicare beneficiaries (Pope et al., 2006). Also, higher payments under the demonstration may have retained some plans in the Medicare managed care program that otherwise would have exited.

The first two factors that led to higher expenditures under the PPO Demonstration were unique to the demonstration, and are not a feature of local PPOs under the regular Medicare Advantage program in 2006 and beyond. (Regional PPOs have some unique rules under Medicare Advantage, but the demonstration plans transitioned to local, not regional, PPOs.) First, the benchmark payment rates for local PPOs are the same as for other Medicare Advantage plans. There is no special higher payment rate for PPOs as there was for demonstration plans in

2003.[23] Second, local PPOs—like other local Medicare Advantage plans—were not offered risk sharing. Also, regarding the third factor, risk adjustment of Medicare Advantage payments transitioned to 100 percent all-encounter health-based adjustment beginning in 2006. Comprehensive health-based risk adjustment should lessen or eliminate higher Medicare expenditures due to favorable selection of FFS beneficiaries into PPO plans. However, the fourth factor that resulted in higher demonstration payments—capitated payment rates that are higher than FFS per capita expenditures—not only continued under Medicare Advantage, but has been expanded with the increases in capitated payment rates mandated by the 2003 MMA. But this factor, as under the demonstration, operates for all Medicare Advantage plans and is not unique to PPOs. In short, higher Medicare expenditures under the demonstration do not imply that local PPOs are raising Medicare payments in 2006 (and after) more than other Medicare Advantage plan types.

We estimated that the predicted medical expenditures (costliness or health status) of PPO Demonstration enrollees was about the same as that of HMO enrollees in the PPO plans' service areas. Both PPO and HMO enrollees were predicted to be substantially less costly than service area FFS beneficiaries, on average. Hence, PPOs experienced about the same degree of favorable selection relative to FFS as HMOs did.

In addition to new Medicare beneficiaries, PPO plans enrolled beneficiaries who were previously enrolled in original FFS Medicare or in an HMO. Enrollees in PPO Demonstration plans who were previously in FFS were much less costly (much healthier) than the average area FFS beneficiary, while PPO enrollees who had previously been enrolled in HMOs were more costly (sicker) than the average area HMO enrollee (excluding the Contract 15 HMO rollover). Hence, PPOs experienced a favorable selection from FFS but an adverse selection from HMOs. PPOs' greater freedom of provider choice than HMOs was attractive to sicker HMO enrollees, but not to sicker FFS beneficiaries.

[23] The higher payment rate for demonstration plans ended in March 2004, in the second year of the demonstration and prior to the inception of Medicare Advantage in 2006. At that point, the 2003 MMA mandated that all Medicare capitation rates rise to at least 100 percent of county FFS per capita expenditures.

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APPENDIX

Appendix Table 1
PPO demonstration cost impact analysis final FFS prediction model first-stage (HCC prediction)

Variable	Label	Coefficient		Standard error	t-ratio	P>|t|	95%CI Lower	95%CI Upper
NOCMSHCC[1]		1,088.01		13.35	81.49	0.00	1,061.84	1,114.18
HCC1	HIV/AIDS	4,073.08		165.82	24.56	0.00	3,748.08	4,398.07
HCC2	Septicemia/Shock	17,749.40		78.88	225.01	0.00	17,594.79	17,904.00
HCC5	Opportunistic Infections	11,548.09		203.83	56.66	0.00	11,148.60	11,947.58
HCC7	Metastatic Cancer and Acute Leukemia	13,213.67		68.21	193.73	0.00	13,079.98	13,347.35
HCC8	Lung, Upper Digestive Tract, and Other Severe Cancers	13,213.67		68.21	193.73	0.00	13,079.98	13,347.35
HCC9	Lymphatic, Head and Neck, Brain, and Other Major Cancers	4,321.22		78.69	54.92	0.00	4,167.00	4,475.44
HCC10	Breast, Prostate, Colorectal and Other Cancers and Tumors	2,311.81		34.75	66.53	0.00	2,243.71	2,379.92
HCC15	Diabetes with Renal or Peripheral Circulatory Manifestation	2,293.19		60.73	37.76	0.00	2,174.17	2,412.22
HCC16	Diabetes with Neurologic or Other Specified Manifestation	2,147.06		58.73	36.56	0.00	2,031.96	2,262.16
HCC17	Diabetes with Acute Complications	2,147.06		58.73	36.56	0.00	2,031.96	2,262.16
HCC18[1]	Diabetes with Ophthalmologic or Unspecified Manifestation	1,088.01		13.35	81.49	0.00	1,061.84	1,114.18
HCC19[1]	Diabetes without Complication	1,088.01		13.35	81.49	0.00	1,061.84	1,114.18
HCC21	Protein-Calorie Malnutrition	14,662.46		96.22	152.38	0.00	14,473.87	14,851.05
HCC25	End-Stage Liver Disease	7,665.46		208.14	36.83	0.00	7,257.51	8,073.41
HCC26	Cirrhosis of Liver	2,139.47		121.65	17.59	0.00	1,901.03	2,377.91
HCC27	Chronic Hepatitis	2,139.47		121.65	17.59	0.00	1,901.03	2,377.91
HCC31	Intestinal Obstruction/Perforation	8,017.39		75.80	105.77	0.00	7,868.83	8,165.96
HCC32	Pancreatic Disease	4,644.14		98.55	47.13	0.00	4,451.00	4,837.29
HCC33	Inflammatory Bowel Disease	2,369.40		110.94	21.36	0.00	2,151.95	2,586.85
HCC37	Bone/Joint/Muscle Infections/Necrosis	7,431.37		104.68	70.99	0.00	7,226.21	7,636.53
HCC38	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	1,831.86		47.76	38.36	0.00	1,738.25	1,925.46
HCC44	Severe Hematological Disorders	7,923.17		106.02	74.73	0.00	7,715.38	8,130.97
HCC45	Disorders of Immunity	10,262.09		109.53	93.69	0.00	10,047.41	10,476.77
HCC51	Drug/Alcohol Psychosis	6,636.62		139.13	47.70	0.00	6,363.93	6,909.31
HCC52	Drug/Alcohol Dependence	4,572.20		123.99	36.88	0.00	4,329.18	4,815.21
HCC54	Schizophrenia	4,797.57		71.19	67.40	0.00	4,658.05	4,937.09
HCC55	Major Depressive, Bipolar, and Paranoid Disorders	3,108.33		47.83	64.99	0.00	3,014.59	3,202.07
HCC67	Quadriplegia, Other Extensive Paralysis	7,123.21	C1	82.77	86.07	0.00	6,960.99	7,285.43
HCC68	Paraplegia	7,123.21	C1	82.77	86.07	0.00	6,960.99	7,285.43
HCC69	Spinal Cord Disorders/Injuries	5,160.44		127.26	40.55	0.00	4,911.03	5,409.86
HCC70[1]	Muscular Dystrophy	1,088.01		13.35	81.49	0.00	1,061.84	1,114.18
HCC71	Polyneuropathy	2,521.41		56.16	44.90	0.00	2,411.34	2,631.48
HCC72	Multiple Sclerosis	2,233.35		154.24	14.48	0.00	1,931.04	2,535.65
HCC73	Parkinson's and Huntington's Diseases	2,043.39		76.13	26.84	0.00	1,894.18	2,192.60
HCC74	Seizure Disorders and Convulsions	2,185.97		58.72	37.23	0.00	2,070.88	2,301.05
HCC75	Coma, Brain Compression/Anoxic Damage	11,473.26		202.52	56.65	0.00	11,076.33	11,870.19
HCC77	Respirator Dependence/Tracheostomy Status	62,827.02		215.88	291.03	0.00	62,403.91	63,250.13
HCC78	Respiratory Arrest	22,056.18		275.50	80.06	0.00	21,516.21	22,596.15
HCC79	Cardio-Respiratory Failure and Shock	10,110.32		57.01	177.33	0.00	9,998.58	10,222.07
HCC80	Congestive Heart Failure	3,078.66		32.80	93.87	0.00	3,014.38	3,142.94
HCC81	Acute Myocardial Infarction	15,455.08		84.87	182.10	0.00	15,288.73	15,621.43
HCC82	Unstable Angina and Other Acute Ischemic Heart Disease	7,769.01		55.24	140.65	0.00	7,660.74	7,877.27
HCC83	Angina Pectoris/Old Myocardial Infarction	2,495.09		42.75	58.37	0.00	2,411.31	2,578.87
HCC92	Specified Heart Arrhythmias	3,284.83		31.40	104.62	0.00	3,223.29	3,346.36
HCC95	Cerebral Hemorrhage	11,262.13		158.35	71.12	0.00	10,951.77	11,572.49
HCC96	Ischemic or Unspecified Stroke	3,265.77		50.31	64.91	0.00	3,167.16	3,364.39
HCC100	Hemiplegia/Hemiparesis	7,123.21	C1	82.77	86.07	0.00	6,960.99	7,285.43
HCC101	Cerebral Palsy and Other Paralytic Syndromes	4,034.00		254.04	15.88	0.00	3,536.09	4,531.92
HCC104	Vascular Disease with Complications	8,918.33		71.67	124.43	0.00	8,777.85	9,058.80
HCC105	Vascular Disease	1,646.14		29.21	56.35	0.00	1,588.88	1,703.40
HCC107	Cystic Fibrosis	2,402.17		728.58	3.30	0.00	974.18	3,830.15
HCC108	Chronic Obstructive Pulmonary Disease	1,717.03		29.66	57.90	0.00	1,658.90	1,775.15
HCC111	Aspiration and Specified Bacterial Pneumonias	11,926.54		102.56	116.28	0.00	11,725.52	12,127.56
HCC112	Pneumococcal Pneumonia, Emphysema, Lung Abscess	4,928.27		158.42	31.11	0.00	4,617.78	5,238.77

(continued)

Appendix Table 1 (continued)
PPO demonstration cost impact analysis final FFS prediction model first stage (HCC prediction)

Variable	Label	Coefficient	Standard error	t-ratio	P>|t|	95%CI Lower	95%CI Upper
HCC130	Dialysis Status	18,960.83	421.04	45.03	0.00	18,135.60	19,786.06
HCC131	Renal Failure	6,342.49	53.41	118.76	0.00	6,237.82	6,447.17
HCC132	Nephritis	2,201.37	179.74	12.25	0.00	1,849.08	2,553.65
HCC148	Decubitus Ulcer of Skin	10,795.94	86.86	124.29	0.00	10,625.69	10,966.19
HCC149[1]	Chronic Ulcer of Skin, Except Decubitus	1,088.01	13.35	81.49	0.00	1,061.84	1,114.18
HCC150	Extensive Third-Degree Burns	34,794.61	1,532.03	22.71	0.00	31,791.89	37,797.33
HCC154	Severe Head Injury	14,047.80	635.76	22.10	0.00	12,801.74	15,293.86
HCC155	Major Head Injury	4,960.11	136.82	36.25	0.00	4,691.96	5,228.26
HCC157	Vertebral Fractures without Spinal Cord Injury	3,665.03	95.86	38.23	0.00	3,477.15	3,852.91
HCC158	Hip Fracture/Dislocation	12,253.71	79.26	154.61	0.00	12,098.37	12,409.04
HCC161	Traumatic Amputation	14,358.08	262.42	54.71	0.00	13,843.74	14,872.42
HCC164	Major Complications of Medical Care and Trauma	13,357.20	59.91	222.95	0.00	13,239.77	13,474.62
HCC174	Major Organ Transplant Status	14,339.45	295.07	48.60	0.00	13,761.13	14,917.77
HCC176	Artificial Openings for Feeding or Elimination	7,467.98	118.41	63.07	0.00	7,235.90	7,700.07
HCC177	Amputation Status, Lower Limb/Amputation Complications	7,382.29	208.62	35.39	0.00	6,973.40	7,791.17

NOTES:

[1] Indicates HCC coefficient constrained to be equal to coefficient from NOCMSHCC.

SOURCE: RTI International analysis of CMS FFS Medicare claims and enrollment data.

Appendix Table 2
PPO demonstration cost impact analysis final FFS prediction model second-stage (demographic spline prediction)

Variable	Label	Coefficient	Standard Error	t-ratio	P>|t|	95%CI Lower	95%CI Upper
yrisk1[1]	Predicted, Stage 1 up to 12,066.21 (Spline)	0.733	0.00	214.07	0.00	0.73	0.74
yrisk2[1]	12,066.21 < Predicted, Stage 1 <= 62,066.21 (Spline)	1.010	0.00	626.89	0.00	1.01	1.01
yrisk3[1]	Predicted, Stage 1 > 62,066.21 (Spline)	1.378	0.00	443.02	0.00	1.37	1.38
dem0_1	NOCMSHCC, Female, Age 0 to 34	1,001.35	186.78	5.36	0.00	635.27	1,367.44
dem0_2	NOCMSHCC, Female, Age 35 to 44	1,128.13	152.02	7.42	0.00	830.17	1,426.09
dem0_3	NOCMSHCC, Female, Age 45 to 54	1,256.05	133.58	9.40	0.00	994.24	1,517.85
dem0_4	NOCMSHCC, Female, Age 55 to 59	1,276.86	170.74	7.48	0.00	942.21	1,611.51
dem0_5	NOCMSHCC, Female, Age 60 to 64	1,353.01	165.88	8.16	0.00	1,027.89	1,678.12
dem0_6	NOCMSHCC, Female, Age 65 to 69	1,197.45	40.93	29.26	0.00	1,117.24	1,277.67
dem0_7	NOCMSHCC, Female, Age 70 to 74	1,341.82	43.54	30.82	0.00	1,256.48	1,427.16
dem0_8	NOCMSHCC, Female, Age 75 to 79	1,404.80	47.10	29.82	0.00	1,312.48	1,497.13
dem0_9	NOCMSHCC, Female, Age 80 to 84	1,419.41	57.59	24.65	0.00	1,306.54	1,532.27
dem0_10	NOCMSHCC, Female, Age 85 to 89	1,370.25	81.74	16.76	0.00	1,210.03	1,530.46
dem0_11	NOCMSHCC, Female, Age 90 to 95	1,387.16	132.38	10.48	0.00	1,127.70	1,646.62
dem0_12	NOCMSHCC, Female, Age Greater than 95	927.95	212.61	4.36	0.00	511.24	1,344.66
dem0_13	NOCMSHCC, Male, Age 0 to 34	472.01	156.06	3.02	0.00	166.13	777.89
dem0_14	NOCMSHCC, Male, Age 35 to 44	605.32	123.32	4.91	0.00	363.61	847.02
dem0_15	NOCMSHCC, Male, Age 45 to 54	607.81	104.35	5.82	0.00	403.28	812.34
dem0_16	NOCMSHCC, Male, Age 55 to 59	648.56	138.84	4.67	0.00	376.43	920.69
dem0_17	NOCMSHCC, Male, Age 60 to 64	743.38	145.35	5.11	0.00	458.49	1,028.26
dem0_18	NOCMSHCC, Male, Age 65 to 69	852.97	46.73	18.25	0.00	761.38	944.56
dem0_19	NOCMSHCC, Male, Age 70 to 74	1,013.26	53.92	18.79	0.00	907.58	1,118.94
dem0_20	NOCMSHCC, Male, Age 75 to 79	1,104.24	62.74	17.60	0.00	981.27	1,227.22
dem0_21	NOCMSHCC, Male, Age 80 to 84	1,122.43	84.34	13.31	0.00	957.13	1,287.73
dem0_22	NOCMSHCC, Male, Age 85 to 89	1,096.34	134.29	8.16	0.00	833.14	1,359.53
dem0_23	NOCMSHCC, Male, Age 90 to 95	1,160.01	258.55	4.49	0.00	653.26	1,666.76
dem0_24	NOCMSHCC, Male, Age Greater than 95	1,031.16	540.16	1.91	0.06	(27.53)	2,089.84
dem0_25	NOCMSHCC, Medicaid	6.40	55.16	0.12	0.91	(101.72)	114.52
dem1_1	At Least One CMS-HCC, Female, Age 0 to 34	2,017.84	170.40	11.84	0.00	1,683.86	2,351.82
dem1_2	At Least One CMS-HCC, Female, Age 35 to 44	993.12	112.34	8.84	0.00	772.93	1,213.30
dem1_3	At Least One CMS-HCC, Female, Age 45 to 54	1,151.69	87.92	13.10	0.00	979.38	1,324.01
dem1_4	At Least One CMS-HCC, Female, Age 55 to 59	1,253.93	103.75	12.09	0.00	1,050.60	1,457.27
dem1_5	At Least One CMS-HCC, Female, Age 60 to 64	1,280.00	97.65	13.11	0.00	1,088.60	1,471.40
dem1_6	At Least One CMS-HCC, Female, Age 65 to 69	1,283.41	44.10	29.10	0.00	1,196.96	1,369.85
dem1_7	At Least One CMS-HCC, Female, Age 70 to 74	1,453.89	41.39	35.12	0.00	1,372.75	1,535.02
dem1_8	At Least One CMS-HCC, Female, Age 75 to 79	1,328.88	40.35	32.93	0.00	1,249.79	1,407.96
dem1_9	At Least One CMS-HCC, Female, Age 80 to 84	1,180.68	43.58	27.09	0.00	1,095.26	1,266.10
dem1_10	At Least One CMS-HCC, Female, Age 85 to 89	820.95	53.41	15.37	0.00	716.27	925.63
dem1_11	At Least One CMS-HCC, Female, Age 90 to 95	710.84	76.47	9.30	0.00	560.95	860.73
dem1_12	At Least One CMS-HCC, Female, Age Greater than 95	517.66	139.24	3.72	0.00	244.75	790.58
dem1_13	At Least One CMS-HCC, Male, Age 0 to 34	275.89	154.20	1.79	0.07	(26.34)	578.12
dem1_14	At Least One CMS-HCC, Male, Age 35 to 44	173.26	100.01	1.73	0.08	(22.75)	369.28
dem1_15	At Least One CMS-HCC, Male, Age 45 to 54	54.01	84.55	0.64	0.52	(111.70)	219.72
dem1_16	At Least One CMS-HCC, Male, Age 55 to 59	33.03	109.50	0.30	0.76	(181.58)	247.64
dem1_17	At Least One CMS-HCC, Male, Age 60 to 64	507.53	101.23	5.01	0.00	309.12	705.93
dem1_18	At Least One CMS-HCC, Male, Age 65 to 69	1,158.18	47.50	24.38	0.00	1,065.08	1,251.28
dem1_19	At Least One CMS-HCC, Male, Age 70 to 74	1,118.49	45.43	24.62	0.00	1,029.45	1,207.52
dem1_20	At Least One CMS-HCC, Male, Age 75 to 79	1,132.06	46.30	24.45	0.00	1,041.32	1,222.80
dem1_21	At Least One CMS-HCC, Male, Age 80 to 84	804.26	53.78	14.95	0.00	698.85	909.68
dem1_22	At Least One CMS-HCC, Male, Age 85 to 89	506.88	74.14	6.84	0.00	361.56	652.20
dem1_23	At Least One CMS-HCC, Male, Age 90 to 95	661.02	129.14	5.12	0.00	407.90	914.14
dem1_24	At Least One CMS-HCC, Male, Age Greater than 95	436.73	291.63	1.50	0.13	(134.85)	1,008.31
dem1_25	At Least One CMS-HCC, Medicaid	46.54	34.51	1.35	0.18	(21.09)	114.17

NOTES:

[1] Spline variables based on the interaction of Predicted from the Stage 1 model and 1-NOCMSHCC.

SOURCE: RTI International analysis of CMS FFS Medicare claims and enrollment data.

Appendix Table 3
PPO demonstration cost impact analysis final FFS prediction model third-stage (geographic multipliers)

MSA	MSA Name	Multiplier	Mean Predicted Expenditures	Mean Actual Expenditures	FFS Sample Beneficiaries
Total		**0.993**	**6,944.84**	**6,944.84**	**2,193,153**
3	Arizona State Non-metro Region	0.930	6,021.92	5,598.33	28,380
14	Illinois State Non-metro Region	0.939	6,149.22	5,777.12	21,784
26	Missouri State Non-metro Region	0.890	6,554.70	5,833.93	20,681
33	New York State Non-metro Region	0.836	6,306.48	5,275.03	51,454
34	North Carolina State Non-metro Region	0.922	6,276.36	5,788.50	36,946
36	Ohio State Non-metro Region	0.850	7,318.76	6,219.77	12,067
38	Oregon State Non-metro Region	0.842	5,291.50	4,455.66	21,140
39	Pennsylvania State Non-metro Region	0.938	6,959.88	6,529.20	75,366
44	Tennessee State Non-metro Region	0.936	6,529.75	6,110.20	73,048
51	West Virginia State Non-metro Region	0.828	6,489.04	5,372.09	133,156
10580	Albany-Schenectady-Troy, NY	0.836	6,375.71	5,327.77	37,970
10900	Allentown-Bethlehem-Easton, PA-NJ	0.941	7,267.08	6,837.49	28,561
11020	Altoona, PA	0.931	6,724.54	6,260.37	9,565
12100	Atlantic City, NJ	0.957	8,455.14	8,093.63	9,230
12580	Baltimore-Towson, MD	1.069	7,314.07	7,815.84	37,923
13820	Birmingham-Hoover, AL	0.969	6,452.29	6,251.09	44,918
14060	Bloomington-Normal, IL	0.919	5,471.14	5,026.06	9,546
15380	Buffalo-Niagara Falls, NY	0.891	6,448.14	5,743.11	19,029
15500	Burlington, NC	0.902	5,714.52	5,156.06	9,432
15980	Cape Coral-Fort Myers, FL	1.010	5,770.36	5,829.13	9,515
16620	Charleston, WV	0.823	6,571.70	5,405.94	24,889
16740	Charlotte-Gastonia-Concord, NC-SC	0.893	6,510.14	5,811.25	9,408
17140	Cincinnati-Middletown, OH-KY-IN	0.886	6,735.57	5,967.00	62,922
17300	Clarksville, TN-KY	0.929	6,330.39	5,880.42	9,357
17460	Cleveland-Elyria-Mentor, OH	0.867	7,917.78	6,861.18	9,464
17860	Columbia, MO	0.847	6,104.03	5,169.12	9,516
18700	Corvallis, OR	0.891	4,710.89	4,195.09	4,526
19060	Cumberland, MD-WV	0.885	7,239.02	6,403.32	4,405
19380	Dayton, OH	0.882	6,648.63	5,866.64	18,890
20500	Durham, NC	0.936	6,261.49	5,863.87	25,118
21500	Erie, PA	0.940	6,545.17	6,150.49	9,512
21660	Eugene-Springfield, OR	0.926	4,992.58	4,622.08	9,489
22380	Flagstaff, AZ	0.938	5,845.15	5,484.10	9,439
23060	Fort Wayne, IN	0.841	6,347.67	5,336.01	9,490
24020	Glens Falls, NY	0.793	6,221.96	4,933.73	16,155
24660	Greensboro-High Point, NC	0.877	6,091.77	5,342.54	28,000
25180	Hagerstown-Martinsburg, MD-WV	0.952	5,617.40	5,348.39	11,866
25420	Harrisburg-Carlisle, PA	0.933	6,642.08	6,198.97	18,903
26580	Huntington-Ashland, WV-KY-OH	0.950	5,635.29	5,351.12	15,087
26900	Indianapolis, IN	0.922	6,572.63	6,057.94	54,741
27620	Jefferson City, MO	0.887	6,235.26	5,528.49	13,505
27740	Johnson City, TN	0.987	5,985.89	5,906.24	20,537
27780	Johnstown, PA	0.932	7,464.93	6,956.80	9,539
28140	Kansas City, MO-KS	0.974	6,292.75	6,130.28	26,637
28700	Kingsport-Bristol-Bristol, TN-VA	0.924	5,547.64	5,125.24	9,495
28940	Knoxville, TN	0.905	6,574.99	5,948.65	37,577
29820	Las Vegas-Paradise, NV	1.006	7,256.02	7,299.99	9,051

(continued)

Appendix Table 3 (continued)
PPO demonstration cost impact analysis final FFS prediction model third-stage (geographic multipliers)

MSA	MSA Name	Multiplier	Mean Predicted Expenditures	Mean Actual Expenditures	FFS Sample Beneficiaries
30140	Lebanon, PA	0.851	5,972.14	5,081.99	9,528
32780	Medford, OR	0.915	5,795.39	5,304.26	9,410
33100	Miami-Fort Lauderdale-Miami Beach, FL	1.142	7,540.85	8,611.18	19,075
33660	Mobile, AL	0.938	6,336.49	5,940.57	9,158
34060	Morgantown, WV	0.949	5,968.49	5,665.21	12,741
34100	Morristown, TN	0.947	6,596.38	6,245.26	18,442
34980	Nashville-Davidson--Murfreesboro, TN	0.987	6,710.38	6,622.16	69,201
35380	New Orleans-Metairie-Kenner, LA	1.069	7,283.80	7,783.47	29,638
35620	New York-Northern New Jersey-Long Island, NY-NJ-PA	1.171	7,702.67	9,023.45	178,678
36140	Ocean City, NJ	0.953	7,794.71	7,430.94	9,572
37620	Parkersburg-Marietta, WV-OH	0.881	6,566.58	5,784.55	11,818
37900	Peoria, IL	0.898	5,798.37	5,206.69	26,736
37980	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1.059	7,721.19	8,178.48	83,998
38060	Phoenix-Mesa-Scottsdale, AZ	0.964	5,850.89	5,637.39	18,707
38300	Pittsburgh, PA	0.965	7,711.84	7,441.58	65,955
38900	Portland-Vancouver-Beaverton, OR-WA	0.914	5,594.44	5,115.75	45,832
39300	Providence-New Bedford-Fall River, RI-MA	0.961	7,080.74	6,804.70	28,231
39460	Punta Gorda, FL	0.939	6,974.07	6,545.24	9,608
39580	Raleigh-Cary, NC	0.922	6,283.06	5,794.80	9,447
39740	Reading, PA	0.949	6,277.60	5,959.81	9,527
40380	Rochester, NY	0.845	5,804.61	4,902.29	3,750
40420	Rockford, IL	0.904	5,816.80	5,258.58	13,955
41180	St. Louis, MO-IL	0.916	6,916.41	6,336.33	85,090
41420	Salem, OR	0.857	5,230.86	4,480.70	14,085
43780	South Bend-Mishawaka, IN-MI	0.941	5,682.06	5,347.06	9,455
44220	Springfield, OH	0.867	7,459.97	6,465.15	9,466
45060	Syracuse, NY	0.915	5,780.85	5,288.48	9,524
45300	Tampa-St. Petersburg-Clearwater, FL	0.943	6,928.96	6,531.94	38,079
45940	Trenton-Ewing, NJ	0.987	7,818.94	7,713.38	9,400
46060	Tucson, AZ	0.926	5,847.07	5,416.34	9,474
46540	Utica-Rome, NY	0.858	6,453.63	5,538.28	9,599
47220	Vineland-Millville-Bridgeton, NJ	0.961	7,718.18	7,414.21	9,362
47900	Washington-Arlington-Alexandria, DC-VA-MD-WV	0.962	6,676.37	6,422.07	20,777
48260	Weirton-Steubenville, WV-OH	0.896	7,918.19	7,098.38	17,715
48540	Wheeling, WV-OH	0.867	6,556.29	5,681.40	18,391
49020	Winchester, VA-WV	0.875	6,118.44	5,353.17	3,014
49180	Winston-Salem, NC	0.926	6,380.40	5,906.33	21,319
49620	York-Hanover, PA	0.951	5,767.39	5,484.58	9,490
49660	Youngstown-Warren-Boardman, OH-PA	0.885	7,550.78	6,683.40	28,677

SOURCE: RTI International analysis of CMS FFS Medicare claims and enrollment data.

Appendix Table 4
PPO cost impact analysis new enrollee first stage prediction model

Observations					2,531,421	
					95%CI	
Variable	Coefficient	Standard error	t-ratio	p-value	Lower	Upper
Females, Aged 0 to 34	4,201	244	17.25	0.00	3,723	4,678
Females, Aged 35 to 44	5,125	163	31.51	0.00	4,806	5,444
Females, Aged 45 to 54	6,005	115	52.31	0.00	5,780	6,230
Females, Aged 55 to 59	6,616	128	51.54	0.00	6,364	6,868
Females, Aged 60 to 64	7,435	122	61.13	0.00	7,196	7,673
Females, Aged 65 to 69	3,852	32	121.04	0.00	3,790	3,914
Females, Aged 70 to 74	5,379	40	135.90	0.00	5,301	5,456
Females, Aged 75 to 79	6,419	40	162.27	0.00	6,342	6,497
Females, Aged 80 to 84	7,494	45	166.93	0.00	7,406	7,582
Females, Aged 85 to 89	8,622	60	144.58	0.00	8,505	8,739
Females, Aged 90 to 94	9,704	94	103.62	0.00	9,520	9,887
Females, Aged 95 or Greater	9,142	175	52.36	0.00	8,800	9,484
Males, Aged 0 to 34	3,333	202	16.47	0.00	2,937	3,730
Males, Aged 35 to 44	4,487	136	33.01	0.00	4,221	4,754
Males, Aged 45 to 54	5,056	97	52.37	0.00	4,866	5,245
Males, Aged 55 to 59	5,650	112	50.29	0.00	5,429	5,870
Males, Aged 60 to 64	7,097	107	66.50	0.00	6,888	7,306
Males, Aged 65 to 69	4,409	35	125.13	0.00	4,340	4,478
Males, Aged 70 to 74	6,279	45	139.82	0.00	6,191	6,367
Males, Aged 75 to 79	7,726	47	163.71	0.00	7,633	7,818
Males, Aged 80 to 84	8,960	58	155.29	0.00	8,847	9,073
Males, Aged 85 to 89	10,087	85	118.76	0.00	9,920	10,253
Males, Aged 90 to 94	11,695	157	74.32	0.00	11,386	12,003
Males, Aged 95 or Greater	11,511	361	31.88	0.00	10,803	12,219
MCAID03, Female 0 le AGE le 34	1,372	287	4.78	0.00	809	1,935
MCAID03, Female 35 le AGE le 44	1,412	207	6.83	0.00	1,007	1,817
MCAID03, Female 45 le AGE le 54	1,872	161	11.65	0.00	1,557	2,186
MCAID03, Female 55 le AGE le 59	1,750	198	8.84	0.00	1,362	2,138
MCAID03, Female 60 le AGE le 64	1,759	197	8.92	0.00	1,373	2,146
MCAID03, Female 65 le AGE le 69	4,094	99	41.49	0.00	3,901	4,287
MCAID03, Female 70 le AGE le 74	3,998	115	34.70	0.00	3,772	4,224
MCAID03, Female 75 le AGE le 79	4,358	117	37.17	0.00	4,128	4,588
MCAID03, Female 80 le AGE le 84	3,786	128	29.49	0.00	3,534	4,037
MCAID03, Female 85 le AGE le 89	3,675	156	23.61	0.00	3,370	3,980
MCAID03, Female 90 le AGE le 94	2,400	213	11.25	0.00	1,982	2,819
MCAID03, Female AGE ge 95	1,106	354	3.12	0.00	412	1,801
MCAID03, Male 0 le AGE le 34	1,471	244	6.04	0.00	994	1,949
MCAID03, Male 35 le AGE le 44	2,190	177	12.34	0.00	1,842	2,538
MCAID03, Male 45 le AGE le 54	2,306	151	15.30	0.00	2,010	2,601
MCAID03, Male 55 le AGE le 59	3,125	219	14.24	0.00	2,695	3,555
MCAID03, Male 60 le AGE le 64	2,705	227	11.91	0.00	2,260	3,150
MCAID03, Male 65 le AGE le 69	4,470	129	34.67	0.00	4,217	4,722
MCAID03, Male 70 le AGE le 74	4,218	164	25.73	0.00	3,896	4,539
MCAID03, Male 75 le AGE le 79	4,048	192	21.13	0.00	3,673	4,423
MCAID03, Male 80 le AGE le 84	5,468	248	22.09	0.00	4,983	5,953
MCAID03, Male 85 le AGE le 89	5,030	352	14.30	0.00	4,341	5,720
MCAID03, Male 90 le AGE le 94	2,445	530	4.61	0.00	1,405	3,484
MCAID03, Male AGE ge 95	3,835	1,019	3.76	0.00	1,838	5,832

SOURCE: RTI International analysis of CMS claims and enrollment data.

Appendix Table 5
PPO cost impact analysis new enrollee second stage prediction model means of actual and predicted expenditures for each MSA and multiplier sorted in descending order of multiplier

MSA/State non-metro region	Label	Prediction from first stage model	Mean of actual expenditures	New enrollee MSA multiplier
Total		**6,593**	**6,593**	**0.999**
35620	New York-Northern New Jersey-Long Island, NY-NJ-PA	6,682	8,340	1.248
33100	Miami-Fort Lauderdale-Miami Beach, FL	6,478	7,853	1.212
12580	Baltimore-Towson, MD	6,496	7,479	1.151
12100	Atlantic City, NJ	6,835	7,849	1.148
37980	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	6,791	7,725	1.137
45940	Trenton-Ewing, NJ	6,742	7,467	1.108
29820	Las Vegas-Paradise, NV	6,061	6,693	1.104
35380	New Orleans-Metairie-Kenner, LA	6,837	7,546	1.104
36140	Ocean City, NJ	6,684	7,338	1.098
47220	Vineland-Millville-Bridgeton, NJ	6,948	7,324	1.054
48260	Weirton-Steubenville, WV-OH	6,759	7,034	1.041
38300	Pittsburgh, PA	6,891	7,111	1.032
10900	Allentown-Bethlehem-Easton, PA-NJ	6,673	6,645	0.996
39460	Punta Gorda, FL	6,403	6,368	0.995
47900	Washington-Arlington-Alexandria, DC-VA-MD-WV	6,490	6,354	0.979
27780	Johnstown, PA	7,030	6,863	0.976
49660	Youngstown-Warren-Boardman, OH-PA	6,700	6,539	0.976
17460	Cleveland-Elyria-Mentor, OH	6,345	6,119	0.964
44220	Springfield, OH	6,666	6,346	0.952
19060	Cumberland, MD-WV	6,676	6,339	0.949
34980	Nashville-Davidson--Murfreesboro, TN	6,841	6,480	0.947
39	PA Non-metro	6,813	6,429	0.944
45300	Tampa-St. Petersburg-Clearwater, FL	6,485	6,078	0.937
41180	St. Louis, MO-IL	6,423	5,985	0.932
39300	Providence-New Bedford-Fall River, RI-MA	7,066	6,572	0.930
36	OH Non-metro	6,707	6,182	0.922
25420	Harrisburg-Carlisle, PA	6,559	6,028	0.919
13820	Birmingham-Hoover, AL	6,547	6,007	0.918
28140	Kansas City, MO-KS	6,423	5,890	0.917
26900	Indianapolis, IN	6,425	5,740	0.893
17140	Cincinnati-Middletown, OH-KY-IN	6,416	5,701	0.889
34100	Morristown, TN	6,994	6,188	0.885
15980	Cape Coral-Fort Myers, FL	6,220	5,499	0.884
19380	Dayton, OH	6,375	5,627	0.883
11020	Altoona, PA	7,024	6,189	0.881
39740	Reading, PA	6,574	5,778	0.879
26	MO Non-metro	6,644	5,801	0.873
17300	Clarksville, TN-KY	6,672	5,823	0.873
21500	Erie, PA	6,806	5,931	0.871
33660	Mobile, AL	6,575	5,671	0.863
37620	Parkersburg-Marietta, WV-OH	6,587	5,678	0.862

(continued)

Appendix Table 5 (continued)
PPO cost impact analysis new enrollee second stage prediction model means of actual and predicted expenditures for each MSA and multiplier sorted in descending order of multiplier

MSA/State non-metro region	Label	Prediction from first stage model	Mean of actual expenditures	New enrollee MSA multiplier
28940	Knoxville, TN	6,839	5,862	0.857
44	TN Non-metro	7,096	6,053	0.853
14	IL Non-metro	6,719	5,718	0.851
34060	Morgantown, WV	6,618	5,631	0.851
39580	Raleigh-Cary, NC	6,443	5,473	0.849
20500	Durham, NC	6,809	5,781	0.849
3	AZ Non-metro	6,454	5,473	0.848
49180	Winston-Salem, NC	6,823	5,784	0.848
16740	Charlotte-Gastonia-Concord, NC-SC	6,579	5,547	0.843
48540	Wheeling, WV-OH	6,726	5,630	0.837
38060	Phoenix-Mesa-Scottsdale, AZ	5,910	4,938	0.836
27620	Jefferson City, MO	6,559	5,478	0.835
49620	York-Hanover, PA	6,407	5,306	0.828
34	NC Non-metro	6,920	5,721	0.827
25180	Hagerstown-Martinsburg, MD-WV	6,415	5,299	0.826
27740	Johnson City, TN	7,129	5,838	0.819
15380	Buffalo-Niagara Falls, NY	6,607	5,393	0.816
46540	Utica-Rome, NY	6,691	5,414	0.809
22380	Flagstaff, AZ	6,730	5,422	0.806
16620	Charleston, WV	6,550	5,264	0.804
26580	Huntington-Ashland, WV-KY-OH	6,637	5,293	0.798
46060	Tucson, AZ	6,320	5,029	0.796
51	WV Non-metro	6,694	5,324	0.795
49020	Winchester, VA-WV	6,698	5,281	0.789
45060	Syracuse, NY	6,443	5,070	0.787
40420	Rockford, IL	6,536	5,142	0.787
10580	Albany-Schenectady-Troy, NY	6,667	5,242	0.786
23060	Fort Wayne, IN	6,592	5,165	0.784
17860	Columbia, MO	6,538	5,105	0.781
43780	South Bend-Mishawaka, IN-MI	6,691	5,195	0.776
32780	Medford, OR	6,722	5,211	0.775
37900	Peoria, IL	6,602	5,110	0.774
33	NY Non-metro	6,822	5,220	0.765
24660	Greensboro-High Point, NC	6,802	5,203	0.765
30140	Lebanon, PA	6,668	5,009	0.751
14060	Bloomington-Normal, IL	6,627	4,958	0.748
15500	Burlington, NC	6,899	5,093	0.738
24020	Glens Falls, NY	6,673	4,890	0.733
38900	Portland-Vancouver-Beaverton, OR-WA	6,807	4,988	0.733
28700	Kingsport-Bristol-Bristol, TN-VA	6,958	5,044	0.725
40380	Rochester, NY	6,874	4,851	0.706
21660	Eugene-Springfield, OR	6,703	4,547	0.678
38	OR Non-metro	6,864	4,420	0.644
41420	Salem, OR	6,931	4,437	0.640
18700	Corvallis, OR	6,738	4,180	0.620

SOURCE: RTI analysis of Medicare claims and enrollment data.