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An examination of the effects of medicare part d on racial/ethnic disparities

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AN EXAMINATION OF THE EFFECTS OF MEDICARE PART D ON RACIAL/ETHNIC DISPARITIES

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DEDICATION

To my husband and best friend Jamshid, to my beautiful children Shima and Yashar, and to my loving parents.

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Chapter 1: Introduction

Medicare Part D is the single most important extension to Medicare since the program's inception. Medicare Part D, which took effect in January 2006, makes prescription drug insurance available to all beneficiaries at a reasonable premium. Under Part D every beneficiary can purchase a drug insurance plan from a range of plans offered by private health insurers, with premium subsidies available to persons with low income and few resources.

Prior to Part D many seniors found paying for prescribed medications to be a challenge (Madden, Graves, Zhang, et al. 2008; Mott, Thorpe, Thorpe, et al. 2010). African-Americans and Hispanics were particularly vulnerable to experiencing difficulties paying for prescription drugs (Gellad, Haas, and Safran 2007). In 2003, 25% of African-American and Hispanic seniors, compared to 11% of White seniors, reported spending less on food and other basic needs in order to pay for prescription drugs (Gellad et al. 2007).

A lack of drug insurance has been found to correlate with reducing or skipping doses of prescribed medications as a way to cope with the cost of the drugs (Balkrishnan 1998; Soumerai, Pierre-Jacques, Zhang, et al. 2006). Not surprisingly, such behavior, called cost-related medication non-adherence (CRN), has been shown to raise the risk of adverse health events (Heisler, Langa, Eby, et al. 2004; Sokol, McGuigan, Verbrugge, et al. 2005; Jensen and Li 2012).

Reducing racial and ethnic health disparities has been a national policy goal for some time (AHRQ 2007; DHHS 2010). Because Part D makes drug insurance available to all beneficiaries, and because it provides substantial premium subsidies for many low-income beneficiaries, it has the potential to significantly reduce disparities in beneficiaries' access to drug insurance, in prescription drug utilization and spending, and in utilization of hospitals and emergency departments.

To the author's knowledge, no studies have examined whether Medicare Part D has reduced racial/ethnic disparities in these areas. This dissertation seeks to fill this void by evaluating the effects of Part D on racial/ethnic disparities, using the Institute of Medicine (IOM) definition of a disparity. Using data from the 2002-2009 Medical Expenditure Panel Survey (MEPS), this study employs a difference-in-differences methodology to isolate the effects of Part D, comparing changes in racial/ethnic disparities among Medicare seniors that occurred following the introduction of Part D to changes in racial/ethnic disparities among adults without Medicare, ages 55-63, over the same period.

The remainder of this dissertation proceeds as follows: Section 2 evaluates the effects of Medicare Part D on racial/ethnic disparities in utilization of and spending in prescription drugs. Part 3 evaluates the effects of Part D on racial/ethnic disparities in utilization of medical services and in total health care cost. Section 4 analyzes the effect of Part D on racial/ethnic disparities discussed in sections 2 and 3, using two alternative definitions of a disparity. Finally Section 5 concludes this dissertation.

Chapter 2: Medicare Part D and Racial/Ethnic Disparities in Utilization and Spending

In this chapter I examine racial/ethnic disparities in five measures: 1) prevalence rate of drug coverage, 2) prevalence of any prescription drug use, 3) annual number of positive prescription drugs filled/refilled, 4) positive annual total prescription drug expenditure, and 5) positive annual out-of-pocket prescription drug expenditure.

2.1 Background

Medicare Part D, enacted as part of the Medicare Modernization Act of 2003, took effect January 1, 2006. Beneficiaries who choose to enroll in Part D select a prescription drug plan and pay a premium for their coverage. Beneficiaries can obtain Part D coverage through two types of private-sector plans: prescription drug plans (PDPs), which only cover drugs, and Medicare Advantage plans with prescription drugs (MAPDs), which cover both medical services and drugs. Alternatively, they can continue with whatever drug insurance they held prior to 2006, provided that plan has benefits at least as generous as the Medicare-set "standard PDP benefits." Besides making drug coverage available to all beneficiaries, Part D provides premium subsidies for beneficiaries with limited income and resources through its "Low-Income Subsidy (LIS) Program." To receive an LIS a beneficiary must apply to the Social Security Administration (SSA) and be deemed to qualify. However, individuals who have both Medicare and Medicaid (called "dual eligibles") do not need to apply, as they are automatically enrolled in the LIS program.

Many studies have investigated the effects of Part D on the take-up of drug insurance, and on prescription drug utilization and spending (Lichtenberg and Sun 2007; Levy and Weir 2009; Mott et al. 2010; Engelhardt and Gruber 2011). Using data from one of the national pharmacy

chains, Lichtenberg and Sun (2007) found an 18% reduction in beneficiaries' prescription drug out-of-pocket spending and a 4.5% increase in prescription utilization as a result of Part D. Using data from the Health and Retirement Study, Levy and Weir (2009) examined the take-up of Part D coverage and the LIS program. They found that how a beneficiary was affected depended on their prior source of coverage. Take-up among beneficiaries without any prior coverage was high. LIS enrollment, however, has been low, mainly because many eligible beneficiaries are unaware of this program or unsure of their eligibility for it. Using data from the 2002-2006 MEPS, Engelhardt and Gruber (2011) estimate that Part D has "crowded-out" 75% of the drug insurance arrangements already in place before the program began, which they argue reduces the expected welfare gains from the program.

Racial/ethnic disparities related to prescription drugs have not been as widely studied as disparities in other areas. Briesacher et al. (2004) compared the prevalence of drug coverage and prescription drug utilization by race and ethnicity among Medicare beneficiaries with chronic conditions using data from the 1999 Medicare Current Beneficiaries Survey (MCBS). Among beneficiaries without any drug coverage, they found that African-Americans and Hispanics used 10-40% percent fewer medications than Whites, and overall they spent up to 60% less on their medications. Gaskin et al. (2006) examined racial/ethnic disparities in drug utilization and spending, also using the 1999 MCBS. They found that, compared to minorities, Whites used more medications and had higher out-of-pocket spending and total spending on drugs.

Earlier research showed that during the 1990s racial/ethnic disparities in the prevalence of drug insurance diminished among Medicare beneficiaries (Briesacher, Stuart, and Shea 2002). From 1993 to 1998 the percentage of Medicare beneficiaries with some type of drug coverage increased from 65 to 76% (Briesacher et al. 2002), in part because of the growth of Medicare

Advantage (MA) plans. Prior to Part D, most MA plans contained drug coverage (Levy et al. 2009). Additionally, before Part D, dual eligibles (about one third of minority seniors) used to receive drug coverage through Medicaid.

Sources of drug coverage tend to vary between Whites and minorities (Gellad et al. 2007; Safran, Strollo, Guterman, et al. 2010). Prior to Part D, relatively more White seniors had drug coverage through employer-sponsored plans (Briesacher et al. 2004; Gellad et al. 2007). Medicaid and MA plans were the two main sources of drug coverage for Hispanic seniors, and Medicaid and employer-sponsored plans were the two main sources of drug coverage for African-American seniors (Briesacher et al. 2004).

Gellad et al. (2007) analyzed data from a 2003 nationwide survey of seniors and found no significant racial/ethnic disparities in drug coverage or drug use. However, they found significant racial/ethnic disparities among seniors in their sources of coverage, in their income and education, and in CRN. They found that among seniors who reported any medication non-adherence, 40 percent of African-Americans and Hispanics compared to 28 percent of Whites reported cost as their reason for non-adherence. Madden et al. (2008) found that Part D significantly reduced the odds of CRN, as well as spending less on basic needs as a means for coping with high out-of-pocket costs.

A few studies have examined the effects of Part D on specific sub-populations. Basu, Yin and Alexander (2010) examined the impact of Part D on dual eligibles, and did not find any significant effects on the number of prescriptions filled, out-of-pocket spending, or total spending, which suggests that dual eligibles made a smooth transition from receiving their drug coverage under Medicaid to receiving it under Part D. Liu and colleagues (2011) investigated

the effects of the program among non-low income beneficiaries and found significant increases in drug utilization and a significant reduction in out-of-pocket spending.

This study is also concerned with the program's effects on specific subpopulations, namely those defined by race and ethnicity, and in particular, its effects on racial/ethnic disparities related to prescription drugs.

2.2 Data and Methods

Data

This study uses the Household Component (HC) files of the 2002-2009 MEPS. MEPS is an ongoing, nationally representative survey of the U.S. civilian, non-institutionalized population, conducted annually by the Agency for Healthcare Research and Quality (AHRQ) (Cohen, Monheit, Beauregard, et al. 1997). This dissertation focuses on Medicare beneficiaries, ages 65 and older, as the "treatment" group, and adults, ages 55 to 63, who are not Medicare eligible, as the "comparison" group. In both groups the study limits the attention to individuals who self-report being (non-Hispanic) African-American, Hispanic, or (non-Hispanic) White, based on MEPS questions regarding race and ethnicity. Other minority groups are not examined due to their small sample counts in MEPS.

The main analytic sample includes 36,902 MEPS respondents, 20,821 of whom are in the treatment group and 16,081 of whom are in the comparison group. In the treatment group there are 10,943 individuals (Whites=8,262, African-Americans=1,307, Hispanics=1,374) who were surveyed between 2002 and 2005 and 9,878 individuals (Whites=7,004, African-Americans=1,550, and Hispanics=1,324) who were surveyed between 2006 and 2009, whereas in the comparison group there are 7,879 individuals (Whites=5,663, African-Americans=1,003, Hispanics=1,213) who were surveyed between 2002 and 2005 and 8,202 individuals

(Whites=5,376, African-Americans=1,383, Hispanics=1,443) who were surveyed between 2006 and 2009.[1]

Throughout, this study adjusts for the clustered and stratified survey design of MEPS, and weights all estimates using the AHRQ-supplied weights. I use SAS 9.3 to carry out all descriptive analyses and Stata 11 for regression analyses.

Dependent and Independent Variables

In this chapter I examine five dependent variables: (1) whether the individual holds prescription drug insurance (from any source), (2) whether any prescriptions are filled during the year, (3) the number of prescriptions (including refills) filled during the year, (4) total annual spending on prescription drugs, and (5) out-of-pocket annual spending on prescription drugs.

MEPS has three sources of information for whether an individual holds drug coverage: the drug insurance section of the survey, the prescription utilization section, and the prescription expenditures section. In the drug insurance section each individual was asked whether they currently hold any drug coverage. Starting in 2006 a separate question was added for Medicare beneficiaries about whether their drug coverage was obtained through Part D. In the utilization and expenditures sections of MEPS, questions were asked regarding each prescription filled during the previous round, if any were, and the total and out-of-pocket cost of each prescription. With each participant's consent, MEPS staff verified the detailed prescription information reported using actual pharmacy records. If consent was not granted, the data are the participant's own self-reported information.

Drug insurance is measured as a dichotomous variable that equals 1 if the drug insurance section, the utilization section, or the expenditures section of MEPS reveals the presence of drug coverage and 0 otherwise. Any-prescriptions-filled and the annual number of prescriptions filled

are from the utilization section of MEPS, and total and out-of-pocket annual spending on prescription drugs are from the expenditures section of MEPS. Before beginning the analysis total and out-of-pocket spending were converted to inflation-adjusted 2007 dollars using the all-items Consumer Price Index.

Andersen's conceptual framework guides the choice of explanatory variables for the models to be estimated (Andersen 1968). Each model includes need-related variables, such as age, gender, and measures of health and functioning. This study also includes predisposing and enabling factors such as marital status, education, income, health insurance, health habits, attitudes towards risk and insurance, location, and language. To control for health and functioning, this study includes a range of variables. Two (0,1) indicators for whether self-rated health and self-rated mental health, respectively, are fair or poor, as opposed to good or better, are included in the models, as well as (0,1) indicators for whether the individual reports any heart problems, diabetes, asthma, arthritis, high blood pressure, or having had a stroke. For physical functioning, we include the number of functional limitations reported, and the number of chronic conditions reported (summed across 10 distinct conditions). This study also includes two summary indices of overall physical and mental health, specifically, the norm-based physical component summary scale (NBPCS) and the norm-based mental component summary scale (NBMCS), both calculated from Version 2 of the Short Form 12 Health Survey (SF12-V2) (Ware, Kosinski, Turner-Bowker, et al. 2002). Marital status is measured with a (0,1) indicator for whether the individual is currently married. Education is measured by a series of mutually-exclusive (0,1) indicators for whether education is less than high school, college degree, graduate school degree, or another degree, with high school serving as the reference category. Household income is measured using four mutually-exclusive categories: poor or near poor (household

income is less than 125% of the federal poverty level (FPL)), low income (household income is 125-199% of FPL), middle income (household income is 200-399% of FPL), and high income (household income is at least 400% of FPL), with low income serving as the reference category. For health insurance this study includes a (0,1) indicator for whether the individual reports (at any time during the past year) having Medicaid, as well as (0,1) indicators describing the nature of their private insurance holdings, specifically, whether the individual holds HMO coverage, private non-HMO insurance, or has no private insurance, with the last of these serving as the reference category. Health habits are measured by two (0,1) indicators, one for whether the individual exercises 2-3 times a week, the other for whether they currently smoke. Attitudes towards insurance are measured by a (0,1) indicator for whether they think they do not need health insurance, and a (0,1) indicator for whether they think health insurance is not worth the cost. This study also controls for whether the individual resides in an urban area, and their US Census region, with the West as the reference category. Finally, all models adjust for English language fluency, with a (0,1) indicator for whether the individual conducted their MEPS interview in English**.**

IOM Definition and Measurement of a Disparity [2]

This dissertation follows the Institute of Medicine's (IOM) definition of a racial or ethnic disparity. In its 2002 report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, the IOM defines a disparity as "a difference in access or treatment provided to members of different racial or ethnic groups that is not justified by the underlying health conditions or treatment preferences of patients." McGuire et al. (2006) and Cook et al. (2007) describe the methods for implementing this definition, and this dissertation applies their methods here.

Briefly, this study uses a four-step procedure to calculate disparities. First, for each outcome measure this study fits a multivariate regression using the explanatory variables described above that allows for the effects of key explanatory variables to vary by race and ethnicity. Second, the study transforms the distribution of the need-related explanatory variables for each minority group to be the same as their distribution among Whites, while leaving the non-need-related variables unchanged. A "rank-and-replace" algorithm is used to make these transformations (McGuire et al. 2006), thereby replicating the entire shape of the Whites' need-related distributions. Third, this study uses the fitted regression to calculate predicted values of the outcome measure for each minority group member using their transformed values for need-related variables and their actual values for other variables in the model. Finally, this study averages these predictions by population group, and calculate a disparity in the outcome measure as the difference between the average hypothetical value for that outcome in the minority group and the average value for that outcome among Whites. In the treatment group disparities are measured before Part D and then after Part D, and the same is done in the comparison group.

Difference-in-Differences and Regression Framework for Evaluation

This dissertation uses a difference-in-differences (DD) methodology to estimate Part D's effects on racial/ethnic disparities in drug coverage, prescription utilization, and prescription drug spending. DD methods are valid if, absent Part D, both the treatment and comparison groups would have experienced similar trends in racial/ethnic disparities over the period (Bertrand, Duflo, and Mullainathan 2004). This study examines this issue and formally tests for trend similarities.

The regression equation below illustrates the basic structure of the estimated models before calculating IOM disparities. In this equation Medicare seniors comprise the "treatment group," and adults without Medicare, ages 55-63, comprise the "comparison group":

$$Y_j = \hat{\beta}_0 + Trt_j\hat{\beta}_1 + PartD_j\hat{\beta}_2 + (Trt_j * PartD_j)\hat{\beta}_3 + A_j\hat{\beta}_{0A} + (A_j * Trt_j)\hat{\beta}_{1A} + (PartD_j * A_j)\hat{\beta}_{2A} + (A_j * Trt_j * PartD_j)\hat{\beta}_{3A} + H_j\hat{\beta}_{0H} + (H_j * Trt_j)\hat{\beta}_{1H} + (PartD_j * H_j)\hat{\beta}_{2H} + (H_j * Trt_j * PartD_j)\hat{\beta}_{3H} + \sum_{i=1}^{K}\hat{\beta}_{3+i}X_{ij} + \varepsilon_j$$

Here, j indexes an individual and Y is one of the outcome measures, e.g., total annual spending on drugs. "PartD" is a (0,1) indicator for whether the individual was surveyed after January, 2006 or before then (1 if after, 0 if before), and "Trt" is a (0,1) indicator for membership in the treatment group (1 if yes, 0 if no). "A" and "H" are (0, 1) indicators for whether the individual is African-American or Hispanic, respectively (1 if yes, 0 if no). Finally, the X_i's are other relevant explanatory variables (described earlier), such as demographic and socio-economic characteristics, and for some of the X_i's, their interactions with the race/ethnicity indicators.[3]

For prescription drug coverage and any-prescriptions-filled, this dissertation fits logistic regressions (Tables B1-B2 in Appendix). For the positive number of prescriptions filled and for each positive expenditure measure the study fits a generalized linear model (GLM) (McCullagh and Nelder 1989). On the basis of a modified Park test (Park 1966) and other recommended diagnostics (Deb, Manning, and Norton 2010; Manning and Mullahy 2001), this study chooses a GLM with a log link and gamma distribution for the two expenditure measures, and chooses a GLM with a log link and negative binomial distribution for the total number of prescriptions filled (Tables B3-B5 in Appendix).

2.3 Results

Table 1 lists the definitions and provides descriptive statistics for all of the variables. The average age of Medicare seniors (treatment group) is 74.1, and the average age of adults without Medicare who are ages 55-63 (comparison group) is 58.6. Compared to adults in the comparison group, Medicare seniors are less healthy (e.g., their average physical component summary score is 41.5 vs. 47.9 in the comparison group, $p<0.001$), have more chronic conditions (2.6 vs. 1.8, $p<0.001$), have less formal education (e.g., 26% vs. 12% report less than a high school education), and have lower annual household income (36% vs. 19% have household income that is less than 199% of FPL). In the treatment group, African-Americans and Hispanics are significantly less healthy, less educated, and have less income than Whites. This is also the case in the comparison group (see Tables A1-A2 in Appendix).

Table 2 reports the unadjusted trends in the gap between African-Americans and Whites, and between Hispanics and Whites prior to Part D. The second column reports the differences between African-Americans and Whites in both the treatment and comparison groups during 2002-2003, whereas the third column reports such differences during 2004-2005. The fourth column reports the changes in the gap over time, and the fifth column reports the net difference-in-differences result between the two time periods and between the comparison and treatment groups. Columns 7 through 11 report analogous statistics comparing Whites and Hispanics. The two DD columns in Table 2 reveal that prior to Part D, the unadjusted trends in racial/ethnic differences were statistically identical in the treatment and comparison groups. In light of these findings, there is a logical basis for adopting a difference-in-differences methodology in this dissertation.

Table 3 reports for the treatment group the IOM-adjusted estimates of the average values for the five outcome measures and the IOM disparities in those outcome measures, prior to and after Part D. Table 4 is a similar table for the comparison group. The estimates in these tables are derived from simulations using the multivariate regressions reported in Appendix Tables B1 – B5, after assigning African-Americans and Hispanics the same distribution of need-related variables that Whites display. The estimated disparities in Tables 3 and 4 are used in Table 5, which summarizes the key findings.

Table 5 reports estimates of the effects of Part D on the IOM disparities between minorities and Whites, using the difference-in-differences methodology. It shows that prior to 2006 there was a 4 percentage point gap (p=0.003) between African-American and White seniors in the prevalence of drug insurance. Following Part D this racial gap fell significantly by 3 percentage points (p=0.025) to 1 percent. However, following Part D, in the comparison group the gap between African-Americans and Whites fell by 1 percentage point, from 13 to 12%. Thus, Part D reduced the racial disparity in drug coverage among Medicare seniors by 2 percentage points, but this change is not statistically significant (p=0.248).

Part D reduced the disparity in any-prescriptions-filled between African-American and White seniors. Over the period, the disparity in this outcome fell by 1 percent among Medicare seniors, while it increased by 2 percent among the near-elderly. Thus, the net effect was a reduction of 3 percentage points in the racial disparity among seniors (p=0.051).

Following Part D, the African-American/White disparity in the annual number of prescriptions filled and in total annual spending on prescription drugs widened slightly, but the change was not significant. The reason it widened is that, among seniors, following Part D drug utilization and total spending on drugs rose more among Whites than they did among African-

Americans, while racial gaps in utilization and spending stayed about the same in the comparison group.

Over the period the racial disparity in annual out-of-pocket spending on prescription drugs declined significantly among Medicare seniors by $58, from $319 to $261 (p=0.015). However, since it also fell in the comparison group, the net result of Part D was an insignificant reduction in the disparity by $34 (P=0.229). (See Tables 3 and 4)

Columns 7-11 in Table 5 relate to disparities between Hispanics and Whites. There was no disparity in the prevalence of drug coverage between Hispanic and White Medicare seniors before or after Part D. Over the period, the disparity between the Hispanic/White seniors in any-prescriptions-filled has risen by a trivial amount, from 3 to 4 percent. In the comparison group, however, it has not changed. Therefore the net effect was a 1 percent insignificant increase in the disparity.

The annual number of prescriptions filled by Hispanic seniors has increased by 5, over the period, from 25 to 30 prescriptions ($p < 0.001$). This was much larger than the increase in the annual number of prescriptions filled by White seniors, which rose by 3, from 30 to 33 prescriptions. Meanwhile, in the comparison group the ethnic disparity in the number of prescriptions filled increased significantly by 1.5 prescriptions. Therefore, the net result of Part D was a significant reduction in the ethnic disparity among seniors in the annual number of prescriptions filled by 3.42 prescriptions (p=0.003).

Among Medicare seniors the ethnic disparity in total spending on drugs grew slightly over the period by $82, from $497 to $579. In the comparison group it increased significantly by $306, from $452 to $758 ($p<0.001$). Thus, Part D resulted in a significant reduction of $223 (p=0.008) in the Hispanic/White disparity in total spending on prescription drugs.

Finally, the ethnic disparity in annual out-of-pocket drug spending among seniors fell significantly over the period by $50, from $330 to $280, while it increased significantly in the comparison group by $113, from $89 to $203. The net effect of Part D was a $164 significant reduction in the ethnic disparity in annual out-of-pocket spending ($p<0.001$).

2.4 Discussion

Three findings emerge from this analysis. First, Medicare Part D significantly reduced the disparity between African-American and White seniors in the percentage of individuals who fill any prescriptions during the year. The disparity fell by 3 percentage points.

Second, Part D significantly reduced Hispanic/White disparities in the annual number of prescriptions filled, in annual out-of-pocket and in total spending on prescription drugs. It reduced the Hispanic/White disparities in the number of prescriptions filled by 3.4, in out-of-pocket spending by $164, and in total prescription drug spending by $224.

Third, Part D had no effects on African-American/White disparities in the prevalence of drug insurance, in the number of prescriptions filled, in out-of-pocket spending on prescription drugs, or on annual total spending on prescription drugs. Nor did Medicare Part D have any effects on Hispanic/White disparities in the prevalence of drug insurance or in the prevalence of filling any prescriptions during a year.

Explanation for the lack of effects on racial/ethnic disparities in the prevalence of drug insurance is that by 2005 such disparities were already almost trivial, and the program significantly expanded the prevalence of drug coverage within all three subpopulations by 20-24 percent. Thus, the old saying, "a rising tide lifts all boats," would seem appropriate for characterizing the effects of Part D on the prevalence of coverage across groups.

This research shows that Part D significantly reduced Hispanic/White disparities in prescription drug utilization and spending, but had little effect on disparities in these areas for African-Americans. Hispanics' disparity declines are largely attributable to increases in their prescription drug utilization and spending. It is important to note here that those increases in utilization and spending among Hispanics were large enough to essentially lift them onto the same footing as African-Americans. That is, adjusted average utilization and spending are now the same for African-American and Hispanic seniors, whereas prior to Part D they were significantly lower for Hispanics.

One explanation for why Hispanics saw larger changes in utilization and spending than African-Americans may have to do with Hispanics' higher rate of enrollment in Medicare Advantage (MA) plans that have drug coverage, as opposed to stand-alone PDPs (Neuman, Strollo, and Cuterman 2007; Levy et al. 2009). MA plans are disproportionately located in the southwest and California, where many Hispanics live (Neuman et al. 2007). Some have also suggested that, at least historically, the West has had more generous public health and outreach programs (Pezzin and Kasper 2002), so education about Part D and the LIS program may have been relatively more effective among Hispanics. Finally, it is important to note that, as shown in Table 4, among adults ages 55-63 there were no changes observed in African-American/White disparities over the entire period, yet significant increases in Hispanic/White disparities occurred. These differences may be explained by the economic hardship of recent years, and the fact that disproportionately more Hispanics lost employer-sponsored health insurance over this period, which is the main source of drug insurance in this age range (Mahmoudi and Jensen 2012).

Yet, there are still significant racial and ethnic disparities in prescription drug utilization and spending that remain after Part D. Why? The persistence in these disparities may be due to

a number of factors. First, there are differences in sources of prescription drug coverage across subpopulations, and different sources provide different depths of protection. Generally speaking, employer plans tend to offer the most generous prescription drug benefits, followed by Medicare Advantage plans, and stand-alone drug plans (Neuman et al. 2007). After Part D most seniors who have already had employer-sponsored plans kept their employer-sponsored drug insurance (Levy et al. 2009). Previous research suggests, relatively fewer African-American and Hispanic seniors report holding employer-sponsored coverage. More say they have a Medicare Advantage plan or Medicaid. Thus, differences in the nature of drug insurance across groups may partially explain the persistence of disparities. But other reasons have to do with the determinants of prescription drug use and spending, more generally. African-American and Hispanic seniors more often lack any usual source of care, they more frequently encounter transportation difficulties, and tend to have lower income, less education, and sometimes English language barriers, all of which tend to depress their use of healthcare, including prescription drugs. As long as these differences remain there will likely be disparities.

Chapter 3: Medicare Part D and Racial/Ethnic Disparities in Utilization of Medical Services

Medicare Part D implemented on January 1, 2006 provided affordable drug coverage to more than 43 million Medicare beneficiaries. Lack of access to affordable prescription drugs, particularly among older adults who in average have more than one chronic condition to manage, has been linked to more serious adverse health events, such as a heart attack or stroke, higher rates of hospitalization, and emergency department visits (Heisler et al. 2004; Sokol et al. 2005; Jensen and Li 2012). While Whites have higher rates of visiting physicians' office, the prevalence rate of hospitalization and emergency visits for potentially preventable chronic conditions are much higher among African-Americans and Hispanics (Davis, Liu, and Gibbons 2003; Jiang, Andrews, Stryer, et al. 2005; Dunlop, Manheim, Song, et al. 2002). According to previous research, race/ethnicity and socioeconomic status have substantial effects on mortality and utilization of different healthcare services (Gornick, Eggers, Reilly, et al. 1996; Eggers and Greenberg 2000; Jha, Fisher, Li, et al. 2005).

Lack of access to prescription drugs may lead to more severe health conditions, hospital admissions that could have arguably been avoided, and more emergency visits. Although affordable drug insurance alone is not sufficient to ensure equitability and efficacy, Part D could potentially reduce the existing disparities in utilization of hospital stays and emergency department visits.

Part D has significantly reduced ethnic disparities in utilization of and spending on prescription drugs between White and Hispanic seniors (see section 2). However, it is not clear if it has reduced disparities in use of services such as hospitalization and emergency department visits. In this chapter I examine racial/ethnic disparities and the effect of Medicare Part D on

three measures: 1) prevalence rate of any hospitalization, 2) prevalence rate of any emergency department visit, and 3) total health care cost.

3.1 Background

During the 1990's, many studies have investigated the relation between race and ethnicity, and rate of hospitalization (Eggers et al. 2000; Dunlop et al. 2002; Davis et al. 2003; Jiang et al. 2005; Allsworth, Toppa, Palin, et al. 2005; Jha et al. 2005). Using data from 1997-1998 National Center for Health Statistics (NCHS) and Health Care Financing Administration (HCFA), Eggers and colleagues (2000) found higher rates of hospitalization among African-Americans and Hispanics. Dunlop et al. (2002) examined the role of economic access in gender and racial/ethnic disparities in use of health services among older adults. Using 1993-1995 data from Asset of Health Dynamics among the Oldest Old (AHEAD), they found that economic access did not have much effect on gender and ethnic disparities in use of medical services that are covered by Medicare. They found, however, that African-American males had fewer physician visits, and both minority and White females had fewer out-patient surgery services. Davis et al. (2003) using 1991-1998 hospital data from California examined trends on racial disparities in preventable hospitalization during the 1990's. They found that African-Americans had significantly higher rate of hospitalization in 1991, and the racial disparity grew wider over the period of study. Allsworth and colleagues (2005) using data from the Systematic Assessment of Geriatric Drug Use via Epidemiology (SAGE) studied racial/ethnic disparities in diabetic medication adherence among the residence of long-term care facilities. They found that African-Americans and Hispanics had significantly lower rates of anti-diabetic medication use than Whites, which possibly suggests more preventable and pervasive treatments in the long run. Jiang et al. (2005) examined racial/ethnic disparity in the rate of preventable hospital

readmission rates among people with diabetes. They used data from 5 different states databases of the Healthcare Cost and Utilization Project (HCUP). They found that among diabetic Medicare beneficiaries Whites had a significantly lower readmission rates compared to African-Americans and Hispanics. Finally, Jha et al. (2005) using 1992-2001 Medicare data examined racial disparities in the use of 9 specific high-cost surgical procedures. They found that in the base year, Whites had a significantly higher rate of utilization for all 9 procedures. They found, over the period, the disparity did not change for 3 of the procedures and grew larger for 5 of them.

Racial/ethnic disparity in the utilization rate of emergency departments has not been extensively studied (Baker, Stevens, and Brook 1996; Sarver, Cydulka, and Baker 2002; Ginde, Espinola, Camargo 2008). Baker, Stevens, and Brook (1996) surveyed patients in a public emergency department over a 3-month period. They found African-Americans were more likely than Whites and Hispanics to have 2 or more emergency visits. However, after adjusting for age, having a usual source of care, having insurance, and having transportation difficulties, they could not associate race and ethnicity with more emergency department use. Sarver et al. (2002) using 1996 Medical Expenditure Panel Survey (MEPS) data studied relationship between having a usual source of care and non-urgent emergency department visits. They found significant correlations between dissatisfaction with or barriers to meet one's usual source of care and the likelihood of having a non-urgent emergency department visit. Ginde et al. (2008), using National Hospital Ambulatory Medical Care Survey of 1993-2005, examined racial disparity in emergency department visits for patients with acute asthma and found that while the rate for African-Americans stayed the same over the entire period, from1998 to 2005, emergency-visit

rates for Whites dropped significantly by 25 percentage points. They also found the general asthma-related emergency-visit rates are higher among African-Americans and Hispanics.

3.2 Data and Methods

Data

The data used for the analyses in this chapter is identical to the data used for analyses in Chapter 2 and is described in detail on pages 6-7.

Dependent and Independent Variables

This study examines racial/ethnic disparities in three measures: (1) whether the individual had any hospitalization during the past year, (2) whether the individual had any emergency department visit during the past year, and (3) positive annual total health care cost.

The prevalence rates of any hospitalization and any emergency department are measured as dichotomous variables that equal 1 if any hospitalization and any emergency department visit occurred, respectively. These two measures are from the utilization section of the MEPS, and the positive total health care spending during the past year is from the expenditures section of the MEPS. Before beginning the analysis, total health care spending converted to inflation-adjusted 2007 dollars using the all-items Consumer Price Index.

Conceptual framework of the study that guides the choice of explanatory variables for the models is the same as what I discussed in chapter 2 and is described in detail on page 8.

IOM Definition and Measurement of a Disparity [2]

This chapter similar to what I discussed in chapter 2 adapts the Institute of Medicine's (IOM) definition of a racial or ethnic disparity. IOM definition is described in detail on pages 9-10.

Difference-in-Differences and Regression Framework for Evaluation

The DD methodology and equation that was used to estimate Part D's effect is the same as what I discussed earlier in chapter 2 on pages 10-11.

For any hospitalization and any emergency department visits, this study fits logistic regressions (Tables B6-B7 in Appendix). For the positive total health care expenditure this study fits a generalized linear model (GLM) (McCullagh and Nelder 1989). On the basis of a modified Park test (Park 1966) and other recommended diagnostics (Deb, Manning, and Norton 2010; Manning and Mullahy 2001), we chose a GLM with a log link and gamma distribution for the positive total health care expenditure (Table B8 in Appendix).

3.3 Results

Table 6 reports the unadjusted trends in the gap between African-Americans and Whites, and between Hispanics and Whites prior to Part D. The second column reports the differences between African-Americans and Whites in both the treatment and comparison groups during 2002-2003, whereas the third column reports such differences during 2004-2005. The fourth column reports the changes in the gap over time, and the fifth column reports the net difference-in-differences result between the two time periods and between the comparison and treatment groups. Columns 7 through 11 report analogous statistics comparing Whites and Hispanics. The two DD columns in Table 6 reveal that except for disparity in "any hospitalizations" between African-Americans and White, prior to Part D, the unadjusted trends in racial/ethnic differences were statistically identical in the treatment and comparison groups. While racial disparity between African-Americans and Whites in "any hospitalization" decreased by 4 percentage points among seniors, it increased by 5 percentage point among the near-elderly. As a result, the DD effect in unadjusted disparity in "any hospitalization" trend prior to Part D was 9 percent ($p=0.018$), making the near-elderly not a suitable comparison group for the DD analysis

of Part D's effect on racial disparity in "any hospitalization." Possible explanations for this divergence in trend are not explored in this study. The DD results are not significant for other measures of disparities. Thus, there is a logical basis for adopting a difference-in-differences methodology for other measures using the near-elderly, ages 55-63, as the comparison group.

Table 7 reports for the treatment group the IOM-adjusted estimates of the average values for the three outcome measures and the IOM disparities in those outcome measures, prior to and after Part D. Table 8 is a similar table for the comparison group. The estimates in these tables are derived from simulations using the multivariate regressions reported in Appendix Tables B6 – B8, after assigning African-Americans and Hispanics the same distribution of need-related variables that Whites display. The estimated disparities in Tables 7 and 8 are used in Table 9, which summarizes the key findings.

Table 9 reports the estimated effects of Part D on the IOM disparities between minorities and Whites, using the difference-in-differences methodology. Because of the lack of an appropriate comparison group, this study is not evaluating effect of Part D on disparity in prevalence of any hospitalizations between White and African-American seniors.

For Hispanics, Table 7 shows that prior to 2006 there was a 3 percentage point gap ($p < 0.0001$) between Hispanic and White seniors in "any hospitalization" rate. Following Part D the disparity did not change. However, the gap between Hispanics and Whites in comparison group fell sharply by 3 percentage point, from 4 to 1 percent. Thus, Part D significantly increased the ethnic disparity in "any hospitalization" between Hispanic and White Medicare seniors by 3 percentage points ($p < 0.001$).

Part D reduced the disparity in "any emergency department visits" between African-American and White seniors by 1 percent. However this reduction was not significant. Prior to 2006, there was no disparity in any emergency visits between White and African-American seniors. Over the period, rate of emergency visits fell by 1 percentage point from 15 to 14 percent among the White seniors, but it increased by 2 percentage point from 15 to 17 percent among the African-American seniors. Similar trend is estimated among the comparison group. While the rate of emergency department visit reduced by 1 percentage point from 9 to 8 percent among the near-elderly Whites, it increased by 1 percent from 10 to 11 percentage points among the near-elderly African-Americans. Thus, the DD effect of Part D was a trivial and insignificant reduction of 1 percent ($p=0.133$) on racial disparity in any emergency department visit.

Prior and after Part D, Hispanic seniors had a 1 percentage point higher rate of any emergency visit. Prior to 2006, 16 percent of Hispanic seniors versus 15 percent of White seniors used the emergency department. After Part D, the rate decreased by 1 percent among both Whites and Hispanic seniors to 14 and 15, respectively. Analogous trend is estimated among the near-elderly. Prior to Part D, 11 percent of the Hispanic near-elderly had "any emergency visit." Over the period, the rate dropped by 2 percentage point to 9 percent. As a result, disparity between the near-elderly Whites and Hispanics in "any emergency visit" reduced by 1 percentage point. Thus, the DD effect of Part D was a significant reduction of disparity in "any emergency visit" by 1 percent ($p=0.004$).

There were significant racial/ethnic disparities in total health care cost prior to and after Part D between Whites and minorities in treatment and comparison groups. In general, Whites spend significantly more on health care. For example, estimated average spending of White seniors' prior to Part D was $9,390. Following Part D, it increased by $166 to $9,556.

Meanwhile, total spending among African-American seniors increased by $591 from $8,133 to $8,724. Over the period, a similar trend happened among the near-elderly. While estimated average spending among the near-elderly Whites increased by $782 from $5,924 to $6,706, estimated average spending among the near-elderly African-Americans also increased by $1,005 from $4,652 to $5,657. Thus, the DD effect of Part D for racial disparity in total medical cost was an insignificant increase in disparity by a trivial amount of $202 (p=0.735). Similarly, Part D insignificantly increased the ethnic disparity in total medical cost between Whites and Hispanic by a trivial amount of $44.81 (p=0.907). Therefore, over the period of study, Part D did not affect the racial/ethnic disparity in total medical cost.

3.4 Discussions

Three findings emerge from this analysis. First, Medicare Part D significantly increased the disparity between Hispanic and White seniors in prevalence of any hospitalization by 3 percentage points.

Second, Part D significantly reduced Hispanic/White disparity in prevalence of any emergency department visits by 1 percentage point. Part D also reduced the disparity between Whites and African-Americans in "any emergency department visits" by 1 percent; however, it was not statistically significant.

Third, Part D had no statistically significant effects on racial/ethnic disparities in total medical costs. Over the period, racial/ethnic disparity in total medical cost increased insignificantly among seniors and near-elderly subpopulations. Thus, significant and persistent racial/ethnic disparities in total medical cost remained intact after Medicare Part D.

This study's findings suggest that while racial/ethnic disparity between White and minority seniors in prevalence rate of "any hospitalization" stays the same over the period, it has increased

significantly among the near-elderly. Over the period, prevalence rate of any hospitalization increased significantly more among the near-elderly minorities than among the near-elderly Whites. This might be explained by the fact that the near-elderly minority individuals are significantly less healthy, have lower prevalence rate of health insurance, have lower rate of visiting physicians, and finally have less access to a usual source of care (Mahmoudi and Jensen, 2012). Among Hispanic seniors, the fact that rate of "any hospitalization" increased significantly among the near-elderly Hispanics while it did not change among Hispanic seniors could be interpreted differently. One possible explanation for the small but significant difference between the near-elderly and senior Hispanics in the prevalence rate of any hospitalization is the significant increase in the prescription drug utilization among Hispanic seniors (see Chapter 2). Thus, this finding suggests that Part D has been successful in keeping the hospitalization rate low among the Hispanic seniors by possibly reducing preventable hospitalization by small but significant rate. Further research among seniors with specific chronic conditions is needed to determine the effectiveness of Part D on rate of preventable hospitalization.

Medicare Part D significantly reduces ethnic disparity between Whites and Hispanics in the prevalence of any emergency department visits. One plausible explanation is that Part D was effective in helping Hispanic seniors manage their illnesses via utilization of prescription drugs.

Third, Part D had no significant effects on racial/ethnic disparity in total medical cost. This study suggests that not only Medicare Part D did not offset other medical cost, but also did not reduce the disparity in total health care cost. Over the period, the change in percentage of "any hospitalization" and "any emergency department visits" among the minority and White seniors were trivial (see Table 8). Although, over the period, health care cost grew faster among

the near-elderly and senior minorities than it did among Whites[4], near-elderly and senior Whites still spend significantly more on health care.

Chapter 4: Alternative Definitions of Racial/Ethnic Disparity

In this chapter I examine the effects of Part D on racial/ethnic disparities in prescription drugs using two alternative definitions of a disparity: 1) AHRQ definition and 2) RDE definition.

4.1 Background

Prior literature reveals a number of different definitions for a "disparity" in access to and utilization of health care. Conceptually, these definitions fall along a continuum that ranges from the simple difference in the mean value of a variable between two population groups (AHRQ, 2007), to the estimated difference between those groups *after* controlling for as many available covariates as possible (Cook, McGuire, and Miranda 2007). Some recent papers document that the estimated size of a disparity can and often does vary with the particular definition adapted (McGuire, Alegria, Cook, et al. 2006). Indeed, one challenge in reviewing prior research on racial and ethnic disparities in access to care is that studies have varied in their definition, making it difficult to compare findings across studies, or to determine whether disparities have been increasing or diminishing over time.

Figure 1 illustrates the distinctions between three different definitions that appear in the literature. The first definition of a disparity, suggested by the Agency for Healthcare Research and Quality (2007), is the simple difference in the unadjusted means of a measure of access between two population groups, such as between Whites and a minority group, such as Hispanics. Some portion of that difference between the two groups is likely attributable to differences in the health status and preferences of Whites and Hispanics. For example, Hispanics may be less likely to have seen a doctor over the past year because they tend to be younger than Whites and thus have fewer medical problems requiring a doctor's attention.

Under a second definition, a difference in access due to differences in health status or differences in personal preferences for care is not considered part of a disparity. Rather, a disparity is a "difference in access or treatment provided to members of different racial or ethnic groups that is not justified by the underlying health conditions or treatment preferences of individuals" (IOM, 2002). In terms of Figure 1, this definition considers a disparity to be the portion of the simple difference due to differences in health insurance and socio-economic factors between Whites and Hispanics, plus the portion due to discrimination, but it excludes the top portion due to differences in health status and personal preferences.

According to a third definition a disparity is what is left over in comparing access between Whites and Hispanics, *after* controlling for as many available covariates as possible, including health status, preferences, health insurance, and socio-economic determinants. In effect, it is the coefficient of an indicator for being Hispanic in a fully specified multivariate regression for the access variable. Cook et al. (2007) call this approach the "residual direct effect" (RDE) method for defining a disparity.

Throughout, this dissertation follows the second definition, which is called the IOM definition. This study views it as a middle-ground between the all-or-nothing extremes of examining a simple difference in means or using an RDE measure. It recognizes that socio-economic factors, such as differences in income and health insurance contribute to disparities in access.

This dissertation implemented the IOM definition by estimating multivariate regression models for the access, utilization, and cost measures, and then using those models to simulate an answer to the following question: "What would the gap in access, utilization, or cost between the minority group and Whites be if the minority individuals had the same health-status as Whites,

but all of their own other characteristics?" This study has not attempted to equalize treatment preferences across groups, because of the inherent difficulties of accurately measuring individual preferences in sample surveys.

Depending what definition of a disparity is used, the findings could be substantially different. This section of the dissertation, evaluates the effect of Medicare Part D, using two alternative definitions of a disparity: 1) unadjusted average (AHRQ) and 2) residual direct effect of race (RDE)

4.2 Results

Unadjusted Average

Table 10 reports the unadjusted average and the corresponding disparities for the eight outcome measures reported separately in chapters 2 and 3 for the White, African American, and Hispanic seniors prior to and after Medicare Part D. Table 10 reveals that African-American in comparison to Whites had significantly higher prescription drug utilization prior and after Part D (32 versus 27 prior to Part D, p=0.002; and 33 versus 30 after Part D, p=0.005). It also shows that there were $125 (p=0.019) and $151 ($p < 0.0001$) gaps between Whites and African-American seniors in out-of-pocket prescription drug spending before and after Part D, respectively. Finally it shows, while there was no significant disparity in "any emergency visits" between White and African-American seniors prior to Part D, disparity grew significantly to 4 percent (p=0.002) after Part D. Table 11 is similar to Table 10 but for the comparison group. It reveals that there were 10 percent ($p < 0.0001$) and 9 percent ($p < 0.0001$) unadjusted disparities in the prevalence of drug coverage between the near-elderly Whites and African-Americans prior to and after Part D. It also shows that prior to Part D the near-elderly African-Americans filled 3 prescription drugs (p=0.036) more than the near-elderly Whites; the gap reduced by 2 to 1 after

Part D. Finally, after Part D, racial disparity in prevalence of "any hospitalization" and "any emergency department visit" increased significantly ($p < 0.0001$), showing higher utilization rates for the near-elderly African-Americans.

The unadjusted differences in Tables 10 and 11 are used in Table 12, which summarizes the DD effect of Part D, using unadjusted average measures. Using unadjusted average measures, Table 12 does not reveal any significant DD effect on reported disparities between White and African-American seniors.

Hispanic measures are reported on the right sides of the Tables 10-12. Table 10 shows 4 percent (P=0.001) and 3 percent (p=0.010) gap in the prevalence of any prescriptions filled between White and Hispanic seniors prior and after Part D, respectively. It also shows $222 (p=0.034) disparity in total prescription spending before Part D, which was reduced to $169 (p=0.200) afterward. Hispanic seniors out-of-pocket cost of prescription drugs were significantly lower than White seniors prior to ($266, $p < 0.0001$) and after ($207, $p < 0.0001$) Part D. Finally, Hispanic seniors in comparison to White seniors had lower prevalence of any hospitalization prior to Part D (16 percent versus 18 percent, p=0.092). Table 11 reveals significantly higher levels of disparities in all measures of outcome between the near-elderly Whites and Hispanics in comparison with Whites and Hispanic seniors. For instance, prior to Part D, there was 27 percent ($p < 0.0001$) disparity between the near-elderly Whites and Hispanics in the prevalence of drug insurance, which was reduced to 22 percent ($p < 0.0001$) over the period. Furthermore, Over the period, disparities between the near-elderly Whites and Hispanics in total cost (from $262 to $577, p=0.030) and in out-of-pocket cost of prescription drugs (from $39 to $136, p=0.103) grew larger; and disparities in prevalence of drug coverage (from 27% to 22%, p=0.114) and any hospitalization (from 4 percent to 2 percent, p=0.104) grew

smaller. Table 12 summarizes the DD effects using the unadjusted averages. Columns 7-9 summarize the findings in Table 10 and 11, and column 10 displays Part D's effect on disparities between White and Hispanic seniors. It shows that Part D significantly reduced disparities in total number of prescriptions filled (or refilled) by 3.81 (p=0.099), and in total cost of prescription drugs by $261 (p=0.094).

Residual Direct Effect

Table 13 reports the RDE estimated values, and the corresponding racial/ethnic disparities for the eight outcome measures reported separately in chapters 2 and 3 for White, African American, and Hispanic seniors prior to and after Medicare Part D, using the IOM definition. First, Table 13 reveals that our findings for the prevalence of drug insurance, any prescriptions filled, any hospitalization, and any emergency visit, using the RDE approach mirror our findings using the unadjusted averages. For utilization of prescription drugs, it shows that African-American seniors in comparison to White seniors had significantly higher prescription drug utilization prior to and after Part D (35 versus 29 prior to Part D, $p < 0.0001$; and 37 versus 31after Part D, $p < 0.0001$). It also shows that prior to Part D, total estimated average of prescription spending was higher among African-American seniors than it was among White seniors ($2357 vs. $2133, p=0.002); however, out-of-pocket cost of prescription drugs was lower for African-American seniors in comparison with White seniors both before and after Part D ($989 vs. $1,088 prior to Part D, $p < 0.0001$; $586 vs. $726 after Part D, $p < 0.0001$). Table 13 shows that prior to Part D African-American seniors had significantly lower total health care cost than White seniors (by $581, $p = 0.055$). After Part D, however, Table 13 does not show any significant disparity between White and African-American seniors. Table 14 is similar to Table 13 but for the comparison group. Similar to Table 13, findings from prevalence of drug

insurance, any prescription filled, any hospitalization, and any emergency visits mirror the findings from Table 11, using unadjusted averages. Table 14 reports higher utilization of drugs among the near-elderly African-Americans in comparison with the near-elderly Whites, prior to and after Part D (23 vs. 20 prior to, p=0.005; and 22 vs. 20 after, p=0.003). It also shows a trivial but lower out-of-pocket drug cost among the near-elderly African-American vs. the near-elderly Whites after Part D ($475 vs. $500, p=0.061).

The RDE adjusted differences in Tables 13 and 14 are reported in Table 15, which summarizes the DD effect of Part D. Table 15, similar to Table 12, using unadjusted averages, does not reveal any significant DD effect on reported disparities between White and African-American seniors.

Hispanic measures are reported on the right side of the Tables 13-15. Table 13 shows higher utilization of prescription drugs among Hispanic seniors in comparison with White seniors after Part D (by 3, p=0.012). It also reports lower out-of-pocket cost (by $211prior to Part D, $p < 0.0001$; and by $200 after Part D, $p < 0.0001$), and lower total health care cost prior to Part D (by $1060, $p < 0.0001$) among Hispanic seniors in comparison with White seniors. Table 14 reveals significantly higher levels of disparities in all measures of outcome between the near-elderly Whites and Hispanics in comparison with Whites and Hispanic seniors. It reports lower utilization of prescription drug (by 1.87 prior to Part D, p=0.016; and by 3.65 after Part D, $p < 0.0001$), lower prescription drug spending (by $250 prior to Part D, $p < 0.0001$; and by $543 after Part D, $p < 0.0001$), and lower total health care cost (by $2,396 prior to Part D, $p < 0.0001$; and by $2,577 after Part D, $p < 0.0001$) among the near-elderly Hispanics versus the near-elderly Whites. Table 14 also shows a significant reduction in out-of-pocket cost of prescription

drugs among the near-elderly Hispanics over the period, which increased the disparity between the near-elderly Whites and Hispanics in out-of-pocket spending from $7 to $144 ($p < 0.0001$).

Table 15 summarizes the DD effects using the RDE adjusted method. Columns 7-9 summarize the findings in Table 13 and 14, and column 10 displays Part D's effect on disparities between White and Hispanic seniors. It shows that Part D significantly reduced disparities in total number of prescriptions filled (or refilled) by 4.87 ($p=0.007$), in total cost of prescription drugs by $321 ($p=0.015$), in total out-of-pocket spending by $147 ($p < 0.0001$), and in prevalence of any emergency visit by 4 percent ($p< 0.0001$). Furthermore, it reports that Part D significantly increased the disparity in prevalence rate of drug insurance by 5 percent ($p=0.073$) and in prevalence of any hospitalization by 2 percent ($p=0.017$).

4.3 Discussion

The main finding using unadjusted averages and the RDE definition suggests that there are fundamental differences between reported racial/ethnic disparities and therefore Part D's effects using IOM versus other alternative definitions.

Findings from this study supports previous research using different definitions of a racial/ethnic disparity (McGuire et al. 2006; Cook et al. 2007) in substantial differences between IOM and other disparity definitions. IOM adjusted disparity unlike the other two definitions, predicts a counter-factual measure of a disparity solely based on Socioeconomic and other non-need related characteristics of individuals. Disparities do not define all differences; they only define part of differences that are unjust (Cook, McGuire, and Zuvekas 2009). Although minority groups are significantly younger, they are less healthy than Whites (Table A1-A2 in Appendix). Differences that are based on lower health needs due to being younger or differences that are based on higher health needs due to being less healthy do not reveal unjust differences.

IOM definition of a disparity allows differences that are due to individuals' socioeconomic status, health insurance, health care operation, or discrimination to be included. Therefore, by adjusting for the need related determinants of demand for health care services, IOM allows socioeconomic aspects of demand to be revealed. For instance, it might be more difficult for individuals with lower socioeconomic status to either pay for prescription drugs or choose an appropriate Part D plan. Since minorities are disproportionately represented in lower socioeconomic groups, their utilization of and spending in prescription drugs are affected by their status. To summarize, showing total average differences (the AHRQ definition) or showing only the discrimination part of a disparity (the RDE definition) could be misleading. Thus, this dissertation advocates for the IOM definition of a disparity.

Chapter 5: Conclusion

This dissertation seeks to evaluate the effect of Medicare Part D on existing racial/ethnic disparities between White and African-American seniors, and White and Hispanic seniors. Using the IOM definition of a disparity, chapter 2 of this dissertation evaluates the effect of Part D on disparities in: 1) prevalence of drug insurance, 2) prevalence of any prescriptions filled, 3) total positive number of prescriptions filled, 4) total positive cost of prescription drugs, and 5) positive out-of-pocket cost of prescription drugs. Findings suggest that Part D reduced disparities between White and African-American seniors in prevalence of any prescriptions filled and between White and Hispanic seniors in total number of prescriptions filled, and in total and out-of-pocket cost of prescription drugs. Using the same dataset and methodology, chapter 3 examines the effects of Medicare Part D on disparities in: 1) prevalence of any hospitalization, 2) prevalence of any emergency department visit, and 3) total health care cost. Findings suggest no effects on disparities between Whites and African-American seniors. However, disparities between White and Hispanic seniors changed differently. This analysis suggests Medicare Part D increased disparity in prevalence of any hospitalization and reduced it in prevalence of any emergency department visit. Finally, chapter 4 of this dissertation examines effects of Medicare Part D on all eight measures of disparities discussed in chapter 2 and 3, using two alternative definitions of a disparity: the unadjusted means and the RDE. The findings suggest a substantial difference between the three definitions.

This dissertation has a number of limitations. First, the most suitable comparison group, for this analysis, would have been a group of Medicare beneficiaries ages 65 and older who were not eligible for Part D. However, such a group does not exist, and therefore like most prior

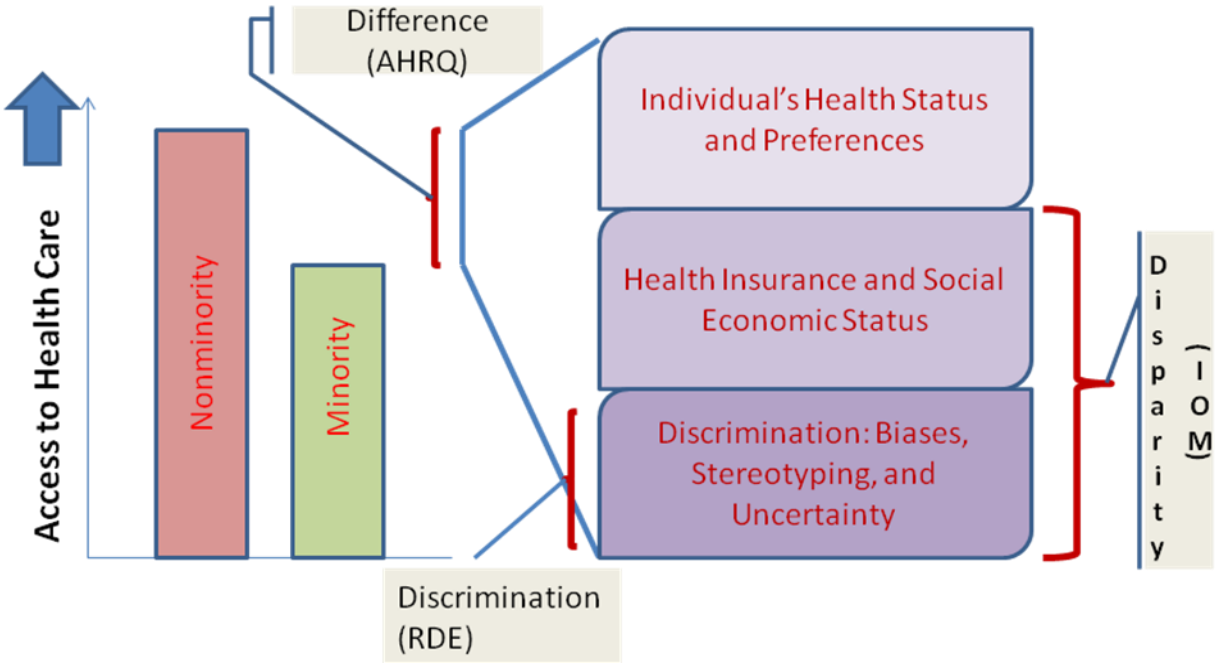
studies (Basu et al. 2010; Liu et al. 2011), this study chose adults ages 55-63 (without Medicare) as the comparison group. Second, there may be differences in preferences and attitudes across racial and ethnic groups that this study was unable to measure, and these may have contributed to racial/ethnic disparities in access and utilization (Ayanian, Cleary, Weissman, et al. 1999). Third, because of their small sample sizes in MEPS, this study was unable to distinguish between Cubans, Puerto Ricans, Mexicans, and other Hispanics within the overall Hispanic population. Finally, this dissertation examined all Medicare seniors. Thus, the results might differ for specific sub-groups of Medicare beneficiaries, such as seniors with specific chronic conditions.

In summary, Medicare Part D has reduced some racial/ethnic disparities related to prescription drugs among Medicare seniors. However, significant racial and ethnic disparities still persist in utilization of and spending on prescribed medications, in utilization of hospitals and emergency departments, and in total healthcare cost.

Notes:

1. These sample counts exclude 8,561 MEPS respondents who had missing data on variables used in our analysis (all described below) or who had non-positive MEPS sampling weights. In the treatment group 2,642 individuals in 2002-2005 and 2,646 individuals in 2006-2009 were excluded for these reasons, and in the comparison group, 1,458 individuals in 2002-2005 and 1,815 individuals in 2006-2009 were excluded for these reasons.
2. This dissertation estimated disparities using two other alternative definitions of a racial/ethnic disparity: the unadjusted difference across groups in the average value of the outcome measure, and the "residual direct effect" estimate of a disparity (Cook et al. 2007). These results are presented in chapter 4.
3. This dissertation applied the paradigm set out by Hosmer and Lemshow (2000) to determine which interaction terms of the X_i's with the race/ethnicity indicators to include in each model and which to exclude. This study further test "variance inflation factors" to verify that each model was multicollinearity-free (Kmenta 1971).
4. Among the seniors, total health care cost grew by 2 percent among the Whites, 7 percent among African-Americans, and 5 percent among the Hispanics. Among the near-elderly, total health care cost grew by 13% among Whites, 22 percent among African-Americans, and 32 percent among Hispanics. The percentage increase among the near-elderly and senior minorities were significant at alpha=0.01 level.

Figure 1 - Measuring Disparity in Access to Healthcare: Unadjusted Difference, Need-Related Adjusted Disparity, and Discrimination.



Note: Adapted from McGuire (2006)

Table 1: Characteristics of the Comparison Group (Individuals without Medicare, ages 55-63) and the Treatment Group (Medicare Beneficiaries, ages 65 and Older) Before Part D

		Comparison[a]		Treatment[b]	
N		7,879		10,943	
Independent Variables	Description	Mean	SE	Mean	SE
Need-related					
Age*	age at the beginning of the year	58.60	0.05	74.09	0.11
Female*	1 if individual is female	0.52	0.01	0.58	0.01
Poor/Fair Health*	1 if individual rates his/her health as poor or fair	0.15	0.01	0.22	0.01
Poor/Fair Mental Health*	1 if individual rates his/her mental health as poor or fair	0.06	0.00	0.08	0.00
PCS*	physical component summary SF12	47.86	0.17	41.48	0.17
MCS	mental component summary SF12	52.06	0.15	52.14	0.15
Function_Index[c]*	Index of Physical Limitation	3.16	0.12	8.03	0.16
Chronic_Index[d]*	Index of 10 diagnosed/reported chronic conditions	1.78	0.03	2.61	0.03
Diabetes*	1 if individual diagnosed with diabetes	0.11	0.00	0.17	0.01
Heart*	1 if individual has any heart problem	0.15	0.01	0.32	0.01
Asthma	1 if individual diagnosed with asthma	0.10	0.00	0.09	0.00
Arthritis*	1 if individual diagnosed with arthritis	0.36	0.01	0.53	0.01
High Blood Pressure*	1 if individual diagnosed with high blood pressure	0.43	0.01	0.61	0.01
Stroke*	1 if individual has ever had a stroke	0.03	0.00	0.10	0.00
Marital Status					
Married*	1 if individual is married	0.70	0.01	0.55	0.01
Education					
Less than High School	1 if individual has no high school diploma	0.12	0.01	0.26	0.01
High School (omitted)*	1 if individual has high school diploma	0.51	0.01	0.50	0.01
College and Graduate	1 if individual has a college or graduate degree	0.30	0.01	0.19	0.01
Other Degree*	1 if individual has other degrees	0.08	0.01	0.05	0.00
Household Income Level					
Poor or Near Poor*	1 if household income < 125% FPL	0. 11	0.00	0.16	0.00
Low Income (omitted)*	1 if household income is 125-199% FPL	0.08	0.00	0.20	0.01
Middle Income*	1 if household income is 200-399% FPL	0.25	0.01	0.30	0.01
High Income*	1 if household income >=400% FPL	0.56	0.01	0.33	0.01
Health Insurance					
Medicaid*	1 if individual has Medicaid	0.04	0.00	0.08	0.00
Private HMO Insurance*	1 if individual holds private HMO insurance	0.31	0.01	0.09	0.01
Private Non-HMO	1 if individual holds private non-HMO insurance	0.48	0.01	0.45	0.01
No Private	1 if individual holds no private insurance	0.21	0.01	0.46	0.01
Health Habits					
Exercise*	1 if individual does exercise	0.58	0.01	0.50	0.01
Smoker*	1 if individual smokes	0.20	0.01	0.10	0.00
Attitude Toward Insurance					
Insurance Not Needed	1 if individual thinks health insurance is not needed	0.06	0.00	0.06	0.00
Insurance Not Worth Cost*	1 if individual thinks health insurance is not worth the	0.23	0.01	0.16	0.01
Location					
Northeast	1 if individual lives in Northeast	0.20	0.01	0.20	0.01

Continued

Table 1 Continued

		Comparison		Treatment	
N		7,879		10,943	
Independent Variables	Description	Mean	SE	Mean	SE
Location					
Midwest	1 if individual lives in Midwest	0.25	0.01	0.23	0.01
South	1 if individual lives in South	0.36	0.01	0.37	0.01
West (omitted)	1 if individual lives in West	0.19	0.01	0.20	0.01
Metropolitan Area	1 if individual lives in a statistical metropolitan area	0.80	0.01	0.78	0.01
Language					
English Language	1 if language of the interview is English	0.96	0.00	0.97	0.00

Source: Data are from the household component files of the 2002-2005 Medical Expenditure Panel Survey.
Notes: The variables listed are the explanatory variables in the estimated regression models.
Tables A1-A2 in the Appendix report detailed descriptive statistics stratified by race and ethnicity for the comparison and treatment groups for the periods before and after Medicare Part D.

a Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
b Treatment group consists of Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.
c Function-Index is an index of limitations on activities of daily living (ADLs) and instrumental activities of daily living (IADLs).
d Chronic-Index is summed across 10 conditions: diabetes, asthma, high blood pressure, coronary heart disease, angina, heart attack, other heart disease, stroke, joint pain, and emphysema.
* The mean of this variable differs significantly between the comparison and treatment group at the alpha = 0.01 level.

Table 2 – Trends in the Unadjusted Differences between Whites and African Americans, and between Whites and Hispanics, for Five Outcomes Related to Prescription Drugs before the Introduction of Medicare Part D

	Whites vs. African-Americans					Whites vs. Hispanics				
Outcome Measures	Difference 2002-2003	Difference 2004-2005	Difference over time	DD	t (p-value)	Difference 2002-2003	Difference 2004-2005	Difference over time	DD	t (p-value)
Drug Insurance										
Treatment (65+)	0.01	0.01	0.00	0.00	0.01	0.03	-0.01	-0.04	-0.01	-0.20
Comparison (55-63)	0.10	0.10	0.00		(0.993)	0.27	0.24	-0.03		(0.844)
Any Prescriptions Filled										
Treatment (65+)	0.04	0.01	-0.03	-0.06	-1.6	0.05	0.04	-0.01	-0.01	-0.19
Comparison (55-63)	0.04	0.07	0.03		(0.111)	0.13	0.13	0.00		(0.849)
Total Number Rx filled										
Treatment (65+)	-2.93	-3.11	-0.18	-2.18	-0.73	3.22	1.77	-1.45	-1.03	-0.41
Comparison (55-63)	-3.27	-1.27	2.00		(0.465)	3.60	3.18	-0.42		(0.685)
Rx Total Spending										
Treatment (65+)	-$80.05	$72.00	$152.05	$18.43	0.08	$235.36	$316.98	$81.62	$5.81	0.02
Comparison (55-63)	-$26.56	$107.06	$133.62		(0.934)	$269.69	$345.50	$75.81		(0.980)
Rx Out-of-Pocket Spending										
Treatment (65+)	$183.53	$165.17	-$18.36	-$85.19	-0.81	$249.55	$296.15	$46.60	$137.86	1.12
Comparison (55-63)	$17.13	$83.96	$66.83		(0.421)	$109.91	$18.65	-$91.26		(0.263)

Source: Data are from the household component files of the 2002-2003 and 2004-2005 Medical Expenditure Panel Survey.
Notes: Estimates are for comparison and treatment groups and are based on the unadjusted averages of outcome measures.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.

Table 3 – IOM Estimates for the Treatment Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	73%	94%	69%***	93%***	-4%	-1%++	72%	94%	-1%	0%+
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any Prescriptions Filled (%)	93%	93%	86%***	87%***	-7%	-6%	90%***	89%***	-3%	-4%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Number Rx filled (#)	30.44	33.20	28.00***	29.62***	-2.44	-3.58	24.97***	29.65***	-5.47	-3.55++
	(7,688)	(6,533)	(1,201)	(1,423)			(1,236)	(1,196)		
Rx Total Spending ($)	$2131.78	$2393.97	$1755.13***	$1880.89***	-$376.65	-$513.08+	$1634.38***	$1814.43***	-$497.40	-$579.54
	(7,688)	(6,533)	(1,201)	(1,423)			(1,236)	(1,196)		
Rx Out-of-Pocket ($)	$1092.12	$727.78	$773.12***	$466.57***	-$319.00	-$261.21++	$761.88***	$447.64***	-$330.24	-$280.14+
	(7,616)	(6,387)	(1,181)	(1,374)			(1,196)	(1,158)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of number of prescriptions filled, total prescription cost, and out-of-pocket cost are based on samples with positive amounts of utilization and expenditure.
*** Significantly different from the estimate for Whites at the alpha = 0.01 level.
+, + + Significantly different from the 2002-2005 estimate at the alpha=0.10 and 0.05 level, respectively.

Table 4 – IOM Estimates for the Comparison Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	88%	90%	75%***	78%***	-13%	-12%	61%***	68%***	-27%	-22%+++
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any Prescriptions Filled (%)	84%	83%	72%***	69%***	-12%	-14%	72%***	71%***	-12%	-12%
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Number Rx filled (#)	21.63	22.38	18.34***	18.29***	-3.29	-4.09	16.52***	15.77***	-5.11	-6.61++
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Total Spending ($)	$1592.00	$1765.31	$1118.66***	$1282.32***	-$473.34	-$482.99	$1140.15***	$1007.52***	-$451.85	-$757.79+++
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Out-of-Pocket ($)	$573.49	$516.76	$418.46***	$385.21***	-$155.03	-$131.55	$484.13***	$313.82***	-$89.36	-$202.94+++
	(4,691)	(4,385)	(792)	(1,036)			(845)	(997)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category.
Estimates of number of prescriptions filled, total prescription cost, and out-of-pocket cost are based on samples with positive amounts of utilization and expenditure.
*** Significantly different from the estimate for Whites at the alpha = 0.01 level.
++, + + +Significantly different from the 2002-2005 estimate at the alpha=0.05 and 0.01 level, respectively.

Table 5 – Difference-in-Differences Estimates of Effects of Medicare Part D on IOM Disparities in Five Outcomes Related to Prescription Drugs between Whites and African-Americans, and between Whites and Hispanics

	Whites Vs. African-Americans					Whites Vs. Hispanics				
Outcome Measures	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)
Drug Insurance										
Treatment (65+)	-0.04	-0.01	0.03	0.02	1.16	-0.01	0.00	0.01	-0.04	-1.55
Comparison (55-63)	-0.13	-0.12	0.01		(0.248)	-0.27	-0.22	0.05		(0.125)
Any Prescriptions Filled										
Treatment (65+)	-0.07	-0.06	0.01	0.03	1.96	-0.03	-0.04	-0.01	-0.01	-0.26
Comparison (55-63)	-0.12	-0.14	-0.02		(0.051)	-0.12	-0.12	0.00		(0.798)
Total Number Rx filled										
Treatment (65+)	-2.44	-3.58	-1.14	-0.34	-0.27	-5.47	-3.55	1.92	3.42	2.97
Comparison (55-63)	-3.29	-4.09	-0.80		(0.787)	-5.11	-6.61	-1.50		(0.003)
Rx Total Spending										
Treatment (65+)	-$376.65	-$513.08	-$136.43	-$126.78	-1.33	-$497.40	-$579.54	-$82.14	$223.80	2.66
Comparison (55-63)	-$473.34	-$482.99	-$9.65		(0.184)	-$451.85	-$757.79	-$305.94		(0.008)
Rx Out-of-Pocket Spending										
Treatment (65+)	-$319.00	-$261.21	$57.79	$34.31	1.21	-$330.24	-$280.14	$50.10	$163.68	4.56
Comparison (55-63)	-$155.03	-$131.55	$23.48		(0.229)	-$89.36	-$202.94	-$113.58		(0.000)

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates for the comparison and treatment groups are based on the adjusted regression models reported in Appendix Tables B1-B5 and the IOM disparity estimates from Tables 3 and 4.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.

Table 6 – Trends in the Unadjusted Differences between Whites and African Americans, and between Whites and Hispanics, for any Hospitalization, any Emergency Department Visits, and Total Health Care Cost before the Introduction of Medicare Part D

	Whites Vs. African-Americans					Whites Vs. Hispanics				
Outcome Measures	Difference 02-03	Difference 04-05	Difference over time	DD	t (p-value)	Difference 02-03	Difference 04-05	Difference over time	DD	t (p-value)
Any Hospitalization										
Treatment (65+)	0.00	0.04	0.04	0.09	2.37	-0.02	-0.02	0.00	0.02	1.03
Comparison (55-63)	0.04	-0.01	-0.05		(0.018)	-0.02	-0.04	-0.02		(0.305)
Any ED Visits										
Treatment (65+)	0.01	0.02	0.01	0.01	0.24	0.00	-0.02	-0.02	0.02	0.47
Comparison (55-63)	0.03	0.03	0.00		(0.808)	0.04	0.00	-0.04		(0.635)
Total Medical Cost										
Treatment (65+)	-$37.68	-$137.25	-$99.57	$675.01	0.44	-$78.51	-$856.69	-$778.18	$869.19	0.60
Comparison (55-63)	$306.85	-$467.73	-$774.58		(0.663)	-$1228.94	-$2876.31	-$1647.37		(0.552)

Source: Data are from the household component files of the 2002-2003 and 2004-2005 Medical Expenditure Panel Survey.
Notes: Estimates are for comparison and treatment groups and are based on unadjusted averages of outcome measures.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.

Table 7 – IOM Estimates for the Treatment Group of Outcomes Related to any Hospitalization, any Emergency Department Visits, and Total Health Care Cost, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Any Hospitalization (%)	19%	18%	19%	18%	0%	0%	16%***	15%***	-3%	-3%+
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any ED Visits (%)	15%	14%	15%	17%***	0%	3%+++	16%*	15%**	1%	1%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Medical Cost (S)	$9390.88	$9556.95	$8133.01***	$8724.14***	-$1257.87	-832.81	$7677.59***	$8054.56***	-$1713.29	-$1502.39
	(8,075)	(6,858)	(1,246)	(1,482)			(1,290)	(1,255)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of total medical cost are based on samples with positive amounts of expenditure.
*, **, *** Significantly different from the estimate for Whites at the alpha = 0.10, 0.05, and 0.01 level, respectively.
+, + + + Significantly different from the 2002-2005 estimate at the alpha=0.10 and 0.01 level, respectively.

Table 8 – IOM Estimates for the Comparison Group of Outcomes Related to Hospitalization, Emergency Department, and Total Health Care Cost, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Any Hospitalization (%)	9%	8%	8%***	11%***	-1%	3%+++	5%***	7%***	-4%	-1%+++
	(5,663)	(5376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any ED Visits (%)	9%	8%	10%***	11%***	1%	3%+++	11%***	9%***	2%	1%+++
	(5,663)	(5376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Medical Cost (S)	$5924.13	$6706.41	$4652.12***	$5657.09***	-$1272.01	-$1049.32	$2996.01***	$3944.38***	-$2928.12	-$2762.03
	(5,321)	(5,050)	(881)	(1,199)			(1,001)	(1,182)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of total medical cost are based on samples with positive amounts of expenditure.
*** Significantly different from the estimate for Whites at the alpha = 0.01 level.
+ + +Significantly different from the 2002-2005 estimate at the alpha=0.01 level.

Table 9 – Difference-in-Differences Estimates of Effects of Medicare Part D on IOM Disparities in any Hospitalization, any Emergency Department Visits, and Total Health Care Cost between Whites and African-Americans, and between Whites and Hispanics

	Whites vs. African-Americans					Whites vs. Hispanics				
Outcome Measures	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)
Any Hospitalization										
Treatment (65+)	0.00	0.00	0.00	-	-	-0.03	-0.03	0.00	-0.03	-4.88
Comparison (55-63)	-0.01	0.03	0.04		-	-0.04	-0.01	0.03		(0.000)
Any ED Visits										
Treatment (65+)	0.00	0.03	0.03	0.01	1.51	0.01	0.01	0.00	0.01	2.91
Comparison (55-63)	0.01	0.03	0.02		(0.133)	0.02	0.01	-0.01		(0.004)
Total Medical Cost										
Treatment (65+)	-$1257.87	-$832.81	-$425.06	-$202.37	-0.34	-$1713.29	-$1502.39	-$210.90	-$44.81	-0.12
Comparison (55-63)	-$1272.01	-$1049.32	-$222.69		(0.735)	-$2928.12	-$2762.03	-$166.09		0.907

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates for the comparison and treatment groups are based on the adjusted regression models reported in Appendix Tables B6-B8 and the IOM disparity estimates from Tables 7 and 8.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.

Table 10 – Unadjusted Average for the Treatment Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	73%	94%	73%	94%	0%	0%	73%	94%	0%	0%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any Prescriptions Filled (%)	93%	93%	92%	92%	-1%	-1%	89%***	90%***	-4%	-3%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Number Rx filled (#)	27.51	30.09	32.87***	33.73***	5.36	3.64	26.34	31.42	-1.17	1.33
	(7,688)	(6,533)	(1,201)	(1,423)			(1,236)	(1,196)		
Rx Total Spending ($)	$1,979.89	$2,230.87	$2,123.54	$2,243.95	$143.65	$13.08	$1,757.48**	$2,061.87	-$222.41	- $169.00
	(7,688)	(6,533)	(1,201)	(1,423)			(1,236)	(1,196)		
Rx Out-of-Pocket ($)	$1,039.45	$657.12	$913.96**	$505.83***	-$125.49	-$151.29	$773.37***	$449.48***	-$266.08	-$207.64
	(7,619)	(6,387)	(1,181)	(1,374)			(1,196)	(1,158)		
Any Hospitalization (%)	18%	17%	20%	19%	2%	2%	16%*	15%	-2%	-2%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any Emergency Visit (%)	19%	18%	20%	22%***	1%	4%+	18%	18%	-1%	0%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Health Care Cost($)	$8,957.50	$8,929.14	$8,877.43	$9,350.99	-$80.07	$421.85	$8,489.33	$9,085.22	-$468.17	$156.08
	(8,075)	(6,858)	(1,246)	(1,482)			(1,290)	(1,255)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of number of prescriptions filled, total prescription cost, out-of-pocket cost, and total healthcare cost are based on samples with positive amounts of utilization and expenditure.
, * Significantly different from the estimate for Whites at the alpha = 0.05 and 0.01 level, respectively.
+ Significantly different from the 2002-2005 estimate at the alpha=0.10 level.

Table 11 – Unadjusted Average for the Comparison Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	88%	90%	78%***	81%***	-10%	-9%	61%***	68%***	-27%	-22%
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any Prescriptions Filled (%)	84%	83%	81%	79%***	-3%	-4%	72%***	70%***	-12%	-13%
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Number Rx filled (#)	18.14	18.81	21.06**	19.79	2.92	0.98	15.08***	14.44***	-3.06	-4.37
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Total Spending ($)	$1,381.12	$1,552.85	$1,391.33	$1,516.54	$10.21	-$36.31	$1,118.69***	$975.43***	-$262.43	-$577.42++
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Out-of-Pocket ($)	$504.30	$439.51	$479.14	$389.28	-$25.16	-$50.23	$465.16	$303.32***	-$39.14	-$136.19+
	(4,691)	(4,385)	(792)	(1,036)			(845)	(997)		
Any Hospitalization (%)	9%	8%	10%	12%***	1%	4%+	5%***	6%	-4%	-2%+
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any Emergency Visit (%)	12%	11%	15%**	16%***	3%	5%	14%*	11%	2%	0%
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Health Care Cost($)	$5,972.55	$6,935.94	$5,874.09	$7,279.05	-$98.46	$343.11	$3,881.45***	$4,568.07***	-$2091.10	-$2367.87
	(5,321)	(5,050)	(881)	(1,199)			(1,001)	(1,182)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for non- Medicare beneficiaries, ages 55-63, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of number of prescriptions filled, total prescription cost, out-of-pocket cost, and total health care cost are based on samples with positive amounts of utilization and expenditure.
*, **, *** Significantly different from the estimate for Whites at the alpha = 0.10, 0.05 and 0.01 level, respectively.
+, + + Significantly different from the 2002-2005 estimate at the alpha=0.10 and 0.05 level, respectively.

Table 12 – Difference-in-Differences Estimates of Effects of Medicare Part D on Unadjusted Disparities in Eight Outcomes Related to Prescription Drugs between Whites and African-Americans, and between Whites and Hispanics

	Whites vs. African-Americans					Whites vs. Hispanics				
Outcome Measures	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)
Drug Insurance										
Treatment (65+)	0.00	0.00	0.00	-0.01	-0.21	0.00	0.00	0.00	0.05	1.04
Comparison (55-63)	-0.10	-0.09	0.01		(0.832)	-0.27	-0.22	-0.05		(0.297)
Any Prescriptions Filled										
Treatment (65+)	-0.01	-0.01	0.00	0.01	0.73	-0.04	-0.03	0.01	0.02	0.50
Comparison (55-63)	-0.03	-0.04	-0.01		(0.464)	-0.12	-0.13	-0.01		(0.619)
Total Number Rx filled										
Treatment (65+)	5.36	3.64	-1.72	0.22	0.08	-1.17	1.33	2.50	3.81	1.65
Comparison (55-63)	2.92	0.98	-1.94		(0.937)	-3.06	-4.37	-1.31		(0.099)
Rx Total Spending										
Treatment (65+)	$143.65	$13.08	-$130.57	-$84.05	-0.36	-$222.41	-$169.00	-$53.41	$261.58	1.68
Comparison (55-63)	$10.21	-$36.31	-$46.52		(0.720)	-$262.43	-$577.42	-$314.99		(0.094)
Rx Out-of-Pocket Spending										
Treatment (65+)	-$125.49	-$151.29	-$25.80	-$0.73	-0.01	-$266.08	-$207.64	$58.44	$155.49	1.63
Comparison (55-63)	-$25.16	-$50.23	-$25.07		(0.993)	-$39.14	-$136.19	-$97.05		(0.103)
Any Hospitalization										
Treatment (65+)	0.02	0.02	0.00	-	-	-0.02	-0.02	0.00	-0.02	0.81
Comparison (55-63)	0.01	0.04	0.03			-0.04	-0.02	0.02		(0.417)
Any Emergency Visit										
Treatment (65+)	0.01	0.04	0.03	0.01	0.47	-0.01	0.00	0.01	0.03	1.09
Comparison (55-63)	0.03	0.05	0.02		(0.639)	0.02	0.00	-0.02		(0.275)
Total Healthcare Cost										
Treatment (65+)	-$80.07	$421.85	$501.92	$60.35	0.05	-$468.17	$156.08	$624.25	$901.02	0.76
Comparison (55-63)	-$98.46	$343.11	$441.57		(0.962)	-$2091.10	-$2367.87	-$276.77		(0.447)

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates for the comparison and treatment groups are based on the unadjusted average from Tables 10 and 11.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.

Table 13 – RDE Adjusted Average for the Treatment Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	73%	94%	73%	94%	0%	0%	73%	94%	0%	0%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any Prescriptions Filled (%)	93%	93%	92%**	92%*	-1%	-1%	89%***	90%***	-4%	-3%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Number Rx filled (#)	29.31	31.94	35.54***	37.16***	6.23	5.22	29.58	35.30***	0.27	3.36++
	(7,688)	(6,533)	(1,201	(1,423)			(1,236)	(1,196)		
Rx Total Spending ($)	$2,133.65	$2,400.00	$2,357.69***	$2,477.42	$ 224.04	$77.42	$1,997.15*	$2,292.00	-$136.50	-$108.00
	(7,688)	(6,533)	(1,201	(1,423)			(1,236)	(1,196)		
Rx Out-of-Pocket ($)	$1,088.73	$726.02	$989.05***	$586.11***	-$99.68	-$139.91	$877.20***	$525.37***	-$211.53	-$200.65
	(7,616)	(6,387)	(1,181)	(1,374)			(1,196)	(1,158)		
Any Hospitalization (%)	18%	17%	20%***	19%***	2%	2%	16%***	15%***	-2%	-2%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Any Emergency Visit (%)	19%	18%	20%	22%	1%++	4%+++	18%	18%	-1%	0%
	(8,262)	(7,004)	(1,307)	(1,550)			(1,374)	(1,324)		
Total Health Care Cost($)	$9,272.46	$9,461.67	$8,691.35*	$9,930.25	-$581.11	$468.58++	$8,211.62***	$8,849.91	-$1060.84	-$611.76
	(8,075)	(6,858)	(1,246)	(1,482)			(1,290)	(1,255)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for Medicare beneficiaries, ages 65 and older, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of number of prescriptions filled, total prescription cost, out-of-pocket cost, and total health care cost are based on samples with positive amounts of utilization and expenditure.
*, **, *** Significantly different from the estimate for Whites at the alpha = 0.10, 0.05, and 0.01 level, respectively.
+ +, + + + Significantly different from the 2002-2005 estimate at the alpha=0.05 and 0.01 level, respectively.

Table 14 – RDE Adjusted Average for the Comparison Group of Outcomes Related to Prescription Drugs, and Disparities during 2002-2005 and 2006-2009 between Whites and African-Americans, and between Whites and Hispanics

	Whites		African-Americans		Disparities		Hispanics		Disparities	
Outcome Measures	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09	02-05	06-09
Drug Insurance (%)	88%	90%	78%***	81%***	-10%	-9%	61%***	68%***	-27%	-22%++
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any Prescriptions Filled (%)	84%	83%	81%**	79%***	-3%	-4%	72%***	70%***	-12%	-13%
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Number Rx filled (#)	20.06	20.58	23.25***	22.82***	3.19	2.24	18.19**	16.93***	-1.87	-3.65+
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Total Spending ($)	$1,530.74	$1,691.55	$1,492.88	$1,663.33	-$37.86	-$28.22	$1,280.62***	$1,147.97***	-$250.12	-$543.58+++
	(4,741)	(4,472)	(808)	(1,085)			(871)	(1,024)		
Rx Out-of-Pocket ($)	$554.89	$500.05	$528.55	$475.97*	-$26.34	-$24.08	$547.39	$355.93***	-$7.50	-$144.12+++
	(4,691)	(4,385)	(792)	(1,036)			(845)	(997)		
Any Hospitalization (%)	9%	8%	10%**	12%***	1%	4%+++	5%***	6%***	-4%	-2%+++
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Any Emergency Visit (%)	12%	11%	15%***	16%***	3%	5%+++	14%***	10%	2%	-1%+++
	(5,663)	(5,376)	(1,003)	(1,383)			(1,213)	(1,443)		
Total Health Care Cost($)	$5,751.97	$6,498.73	$5,508.21	$6,553.87	-$243.76	$55.14	$3,355.04***	$3,921.42***	-$2396.93	-$2,577.31
	(5,321)	(5,050)	(881)	(1,199)			(1,001)	(1,182)		

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates are for non-Medicare beneficiaries, ages 55-63, who self-report being White, African-American, or Hispanic.
The numbers in parentheses are the number of individual in this sample category. Estimates of number of prescriptions filled, total prescription cost, and out-of-pocket cost are based on samples with positive amounts of utilization and expenditure.
*, **, *** Significantly different from the estimate for Whites at the alpha = 0.10, 0.05, and 0.01 level, respectively.
+, + +, + + + Significantly different from the 2002-2005 estimate at the alpha=0.10, 0.05, and 0.01 level, respectively.

Table 15 – Difference-in-Differences Estimates of Effects of Medicare Part D on RDE Adjusted Disparities in Eight Outcomes Related to Prescription Drugs between Whites and African-Americans, and between Whites and Hispanics

	Whites vs. African-Americans					Whites vs. Hispanics				
Outcome Measures	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)	Difference 2002-2005	Difference 2006-2009	Difference over time	DD	t (p-value)
Drug Insurance										
Treatment (65+)	0.00	0.00	0.00	-0.01	-0.38	0.00	0.00	0.00	-0.05	-1.80
Comparison (55-63)	-0.10	-0.09	0.01		(0.705)	-0.27	-0.22	0.05		(0.073)
Any Prescriptions Filled										
Treatment (65+)	-0.01	-0.01	0.00	0.01	1.25	-0.04	-0.03	0.01	0.02	0.80
Comparison (55-63)	-0.03	-0.04	-0.01		(0.211)	-0.12	-0.13	-0.01		(0.422)
Total Number Rx filled										
Treatment (65+)	6.23	5.22	-1.01	-0.06	-0.03	0.27	3.36	3.09	4.87	2.69
Comparison (55-63)	3.19	2.24	-0.95		(0.974)	-1.87	-3.65	-1.78		(0.007)
Rx Total Spending										
Treatment (65+)	$224.04	$77.42	-$146.62	-$156.26	-1.15	-$136.50	-$108.00	$28.50	$321.96	2.44
Comparison (55-63)	-$37.86	-$28.22	$9.64		(0.251)	-$250.12	-$543.58	-$293.46		(0.015)
Rx Out-of-Pocket Spending										
Treatment (65+)	-$99.68	-$139.91	-$40.23	-$42.49	-1.12	-$211.53	-$200.65	$10.88	$147.50	3.67
Comparison (55-63)	-$26.34	-$24.08	$2.26		(0.264)	-$7.50	-$144.12	-$136.62		(0.000)
Any Hospitalization										
Treatment (65+)	0.02	0.02	0.00	-	-	-0.02	-0.02	0.00	-0.02	-2.39
Comparison (55-63)	0.01	0.04	0.03		-	-0.04	-0.02	0.02		(0.017)
Any Emergency Visit										
Treatment (65+)	0.01	0.04	0.03	0.01	1.55	-0.01	0.00	0.01	0.04	3.95
Comparison (55-63)	0.03	0.05	0.02		(0.122)	0.02	-0.01	-0.03		(0.000)
Total Healthcare Cost										
Treatment (65+)	-$581.11	$468.58	$1,049.69	$750.79	1.39	-$1060.84	-$611.76	$449.08	$629.46	1.10
Comparison (55-63)	-$243.76	$55.14	$298.90		(0.166)	-$2396.93	-$2577.31	-$180.38		(0.271)

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.
Notes: Estimates for the comparison and treatment groups are based on the adjusted regression models reported in Appendix Tables B9-B17 and the disparity estimates from Tables 13 and 14.
Comparison group consists of adults without Medicare, ages 55-63, who self-report being White, African-American, or Hispanic.
Treatment group consists of Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.

APPENDIX A1: CHARACTERISTICS OF MEDICARE BENEFICIARIES, AGES 65 AND OVER, BY RACE AND ETHNICITY IN 2002-2005 AND IN 2006-2009

		White		Black		Hispanic	
		02-05	06-09	02-05	06-09	02-05	06-09
N		8,262	7,004	1,307	1,550	1,374	1,324
List of Independent Variables	Description						
Need-related							
Age	age at the beginning of the year	74.27	74.21	72.95***	73.77+	72.87**	73.75
Female	1 if individual is female	0.57	0.57	0.61	0.63+++	0.56	0.57
Poor/Fair Health	1 if individual rates his/her health as poor or fair	0.20	0.20	0.35	0.34+++	0.38	0.39+++
Poor/Fair Mental Health	1 if individual rates his/her mental health as poor/fair	0.07	0.07	0.14	0.16+++	0.15	0.17+++
PCS	physical component summary SF12	41.72	41.61	39.53	40.02++	40.61	39.83+++
MCS	mental component summary SF12	52.47	52.93	50.73	51.10++	49.05	48.78+++
Function_ Index[a]	Index of Physical Limitation	7.73	7.66	10.77	10.68++	8.81	8.95++
Chronic_Index[b]	Index of 10 diagnosed/reported chronic conditions	2.61*	2.93	2.81***	3.17+++	2.46***	2.79
Diabetes	1 if individual diagnosed with diabetes	0.15	0.18	0.30	0.30+++	0.30	0.32+++
Heart	1 if individual has any heart problem	0.33	0.37	0.27	0.31+++	0.22***	0.28+++
Asthma	1 if individual diagnosed with asthma	0.08	0.09	0.10	0.11	0.08	0.09
Arthritis	1 if individual diagnosed with arthritis	0.53	0.58	0.53***	0.63+++	0.48	0.51+++
High Blood Pressure	1 if individual diagnosed with high blood pressure	0.60	0.66	0.77**	0.82+++	0.62***	0.70++
Stroke	1 if individual has ever had a stroke	0.10	0.12	0.11*	0.14++	0.08	0.10
Marital Status							
Married	1 if individual is married	0.57	0.57	0.34	0.33+++	0.48	0.47+++
Education							
Less than High School	1 if individual has no high school diploma	0.21	0.17	0.44	0.43+++	0.68	0.65+++
High School (omitted)	1 if individual has high school diploma	0.53	0.55	0.40	0.42+++	0.23	0.23+++
College and Graduate School	1 if individual has a college or graduate degree	0.20	0.23	0.12	0.12+++	0.08	0.09+++
Other Degree	1 if individual has other degrees	0.06	0.06	0.03	0.04++	0.02	0.03+++
Household Income Level							
Poor or Near Poor	1 if household income < 125% FPL	0.14	0.14	0.35*	0.32+++	0.33*	0.30+++
Low Income (omitted)	1 if household income is 125-199% FPL	0.19	0.17	0.27	0.24+++	0.23	0.23+++
Middle Income	1 if household income is 200-399% FPL	0.31	0.31	0.23*	0.26+++	0.26	0.27+
High Income	1 if household income >=400% FPL	0.36	0.38	0.15	0.18+++	0.17	0.19+++

Continued

		White		Black		Hispanic	
		02-05	06-09	02-05	06-09	02-05	06-09
Health Insurance [a]							
Medicaid	1 if individual has Medicaid	0.04	0.04	0.25**	0.19+++	0.34	0.32+++
Private HMO Insurance	1 if individual holds private HMO insurance	0.09	0.08	0.09	0.09	0.08	0.07
Private Non-HMO Insurance	1 if individual holds private non-HMO insurance	0.49	0.41	0.25**	0.19+++	0.14	0.11+++
No Private Insurance(omitted)	1 if individual holds no private insurance	0.42	0.51	0.65	0.72+++	0.77	0.81+++
Health Habits							
Exercise	1 if individual does exercise	0.51	0.50	0.37	0.38+++	0.45	0.41+++
Smoker	1 if individual smokes	0.10	0.09	0.13	0.11+	0.10*	0.07
Attitude Toward Risk and Health Insurance							
Insurance Not Needed	1 if individual thinks health insurance is not needed	0.06	0.06	0.05	0.06	0.10*	0.07
Insurance Not Worth Cost	1 if individual thinks health insurance is not worth the	0.16	0.15	0.18	0.19++	0.21**	0.17
Location							
Northeast	1 if individual lives in Northeast	0.21	0.20	0.18	0.19	0.13	0.15++
Midwest	1 if individual lives in Midwest	0.24	0.25	0.20	0.15+++	0.05	0.05+++
South	1 if individual lives in South	0.35	0.36	0.53	0.57+++	0.44	0.42
West (omitted)	1 if individual lives in West	0.20	0.19	0.08	0.09+++	0.38	0.38+++
Metropolitan Area	1 if individual lives in a statistical metropolitan area	0.76	0.78	0.86	0.85+++	0.93	0.91+++
Language							
English Language	1 if language of the interview is English	1.00	1.00	1.00	1.00	0.50	0.46+++

Source: Data are from the household component files of the 2002-2009 Medical Expenditure Panel Survey.

a Function-Index is an index of limitation on activities of daily living (ADLs) and instrumental activities of daily living (IADLs).

b Chronic-Index is summed across 10 conditions: diabetes, asthma, high blood pressure, coronary heart disease, angina, heart attack, other heart disease, stroke, joint pain, and emphysema.

*, **, *** Significantly different from 2006-2009 at the alpha = 0.10, 0.05, and 0.01 level, respectively.

+, ++, +++ Significantly different from Whites at the alpha = 0.10, 0.05, and 0.01 level, respectively.

APPENDIX A2: CHARACTERISTICS OF THE NEAR-ELDERLY ADULTS WITHOUT MEDICARE, AGES 55-63, BY RACE AND ETHNICITY IN 2002-2005 AND IN 2006-2009

		White		Black		Hispanic	
		02-05	06-09	02-05	06-09	02-05	06-09
N		5,663	5,376	1,003	1,383	1,213	1,443
List of Independent Variables	Description						
Need-related							
Age	age at the beginning of the year	58.62	58.74	58.54	58.43+++	58.36	58.29++
Female	1 if individual is female	0.52	0.51	0.58	0.55+	0.51	0.51
Poor/Fair Health	1 if individual rates his/her health as poor or fair	0.13	0.14	0.25	0.24+++	0.26	0.26+++
Poor/Fair Mental Health	1 if individual rates his/her mental health as poor/fair	0.05	0.06	0.08	0.09+++	0.09	0.09+++
PCS	physical component summary SF12	48.32	48.19	44.99*	46.14+++	45.98**	47.72
MCS	mental component summary SF12	52.33	52.25	51.67	51.60	49.44*	50.37++
Function _Index[a]	Index of Physical Limitation	2.93	2.95	5.07	4.54+++	3.47***	2.23+++
Chronic_Index[b]	Index of 10 diagnosed/reported chronic conditions	1.77***	1.89	2.08	2.14+++	1.51	1.56+++
Diabetes	1 if individual diagnosed with diabetes	0.10***	0.13	0.19	0.21+++	0.18	0.22+++
Heart	1 if individual has any heart problem	0.15	0.17	0.12**	0.16	0.10	0.10+++
Asthma	1 if individual diagnosed with asthma	0.10	0.09	0.11	0.10	0.08	0.06++
Arthritis	1 if individual diagnosed with arthritis	0.37	0.38	0.39	0.40	0.28	0.27+++
High Blood Pressure	1 if individual diagnosed with high blood pressure	0.41***	0.46	0.63	0.64+++	0.39*	0.45
Stroke	1 if individual has ever had a stroke	0.03	0.03	0.05	0.06++	0.03	0.04
Marital Status							
Married	1 if individual is married	0.73	0.71	0.49	0.46+++	0.65*	0.60+++
Education							
Less than High School	1 if individual has no high school diploma	0.07***	0.05	0.25**	0.19+++	0.51**	0.44+++
High School (omitted)	1 if individual has high school diploma	0.52***	0.48	0.48*	0.53++	0.33	0.37+++
College and Graduate School	1 if individual has a college or graduate degree	0.32***	0.36	0.21	0.20+++	0.12	0.13+++
Other Degree	1 if individual has other degrees	0.08***	0.10	0.06	0.08+	0.04	0.06+++
Household Income Level							
Poor or Near Poor	1 if household income < 125% FPL	0.08	0.08	0.25	0.22+++	0.25	0.20+++
Low Income (omitted)	1 if household income is 125-199% FPL	0.07	0.07	0.14	0.16+++	0.16	0.19+++
Middle Income	1 if household income is 200-399% FPL	0.25	0.24	0.25*	0.30+++	0.32	0.30+++

Continued

		White		Black		Hispanic	
		02-05	06-09	02-05	06-09	02-05	06-09
High Income	1 if household income >=400% FPL	0.61	0.62	0.36	0.32+++	0.27	0.31+++
Health Insurance							
Medicaid	1 if individual has Medicaid	0.03	0.03	0.13	0.13+++	0.12	0.09+++
Private HMO Insurance	1 if individual holds private HMO insurance	0.31***	0.25	0.32**	0.25	0.30	0.27
Private Non-HMO Insurance	1 if individual holds private non-HMO insurance	0.52***	0.57	0.31*	0.36+++	0.20*	0.24+++
No Private Insurance(omitted)	1 if individual holds no private insurance	0.16	0.18	0.37	0.39+++	0.50	0.49+++
Health Habits							
Exercise	1 if individual does exercise	0.60	0.60	0.49	0.51+++	0.48	0.50+++
Smoker	1 if individual smokes	0.20	0.18	0.25	0.24+++	0.11	0.13+++
Attitude Toward Risk and Health Insurance							
Insurance Not Needed	1 if individual thinks health insurance is not needed	0.06	0.06	0.06	0.08	0.12	0.11+++
Insurance Not Worth Cost	1 if individual thinks health insurance is not worth the	0.23	0.22	0.24	0.22	0.23	0.26++
Location							
Northeast	1 if individual lives in Northeast	0.20	0.20	0.16	0.17	0.19	0.16+
Midwest	1 if individual lives in Midwest	0.27	0.25	0.21	0.17+++	0.07	0.08+++
South	1 if individual lives in South	0.34	0.34	0.55	0.57+++	0.36	0.35
West (omitted)	1 if individual lives in West	0.19	0.21	0.08	0.08+++	0.38	0.42+++
Metropolitan Area	1 if individual lives in a statistical metropolitan area	0.79	0.79	0.86**	0.91+++	0.92	0.94+++
Language							
English Language	1 if language of the interview is English	1.00	1.00	1.00	1.00	0.52	0.47+++

Source: The data is from the household component file of the 2002-2009 Medical Expenditure Panel Survey.

a Function-Index is an index of limitation on activities of daily living (ADLs) and instrumental activities of daily living (IADLs).

b Chronic-Index is summed across 10 conditions: diabetes, asthma, high blood pressure, coronary heart disease, angina, heart attack, other heart disease, stroke, joint pain, and emphysema.

*, **, *** Significantly different from 2006-2009 at the alpha = 0.10, 0.05, and 0.01 level, respectively.

+, ++, +++ Significantly different from Whites at the alpha = 0.10, 0.05, and 0.01 level, respectively.

APPENDIX B1: LOGIT REGRESSION RESULTS FOR HAVING DRUG INSURANCE COVERAGE: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	-0.690	0.107	-6.440	0.000
part d	0.232	0.080	2.910	0.004
treatment * part d	1.838	0.125	14.710	0.000
black	-1.274	0.200	-6.380	0.000
black * treatment	0.829	0.183	4.540	0.000
black * part d	0.064	0.166	0.380	0.701
black * treatment * part d	0.254	0.236	1.080	0.282
hispanic	-1.172	0.206	-5.690	0.000
hispanic * treatment	1.621	0.231	7.010	0.000
hispanic * part d	0.381	0.167	2.280	0.023
hispanic * treatment * part d	-0.061	0.319	-0.190	0.848
age	0.000	0.006	0.020	0.986
female	-0.429	0.046	-9.260	0.000
poor/fair health	-0.039	0.075	-0.530	0.597
poor/fair mental health	0.066	0.082	0.800	0.426
pcs	-0.009	0.003	-3.230	0.001
mcs	-0.001	0.002	-0.290	0.773
function_index	0.002	0.003	0.850	0.398
chronic_index	0.126	0.037	3.440	0.001
diabetes	0.603	0.076	7.900	0.000
heart	0.086	0.078	1.100	0.274
asthma	0.366	0.095	3.850	0.000
arthritis	0.123	0.070	1.750	0.081
High blood pressure	0.480	0.066	7.260	0.000
stroke	-0.102	0.096	-1.060	0.288
married	0.291	0.056	5.230	0.000
less than high school	-0.228	0.062	-3.660	0.000
college and graduate	0.147	0.073	2.010	0.045
other degree	0.019	0.105	0.180	0.858
poor or near poor	-0.070	0.066	-1.060	0.292
middle income	0.181	0.068	2.670	0.008
high income	0.442	0.077	5.720	0.000
medicaid	2.314	0.132	17.510	0.000
private hmo	2.670	0.117	22.760	0.000
private non-hmo	1.782	0.081	21.920	0.000
exercise	0.002	0.047	0.050	0.961
smoker	-0.187	0.070	-2.670	0.008

Continued

Explanatory Variables	β	SE	t	P > t
insurance not needed	-0.623	0.081	-7.690	0.000
insurance not worth cost	-0.436	0.056	-7.750	0.000
northeast	-0.008	0.105	-0.070	0.941
midwest	-0.154	0.087	-1.780	0.076
south	-0.166	0.077	-2.150	0.032
metropolitan area	0.378	0.067	5.620	0.000
english language	0.349	0.135	2.580	0.010
black * poor health	0.575	0.165	3.480	0.001
black * middle income	0.305	0.116	2.630	0.009
black * private hmo	0.740	0.312	2.380	0.018
black * private non-hmo	1.004	0.227	4.430	0.000
black * insurance not worth cost	0.358	0.114	3.140	0.002
hispanic * married	-0.505	0.147	-3.440	0.001

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: $F(52, 404) = 71.86$ $P < 0.0001$

APPENDIX B2: LOGIT REGRESSION RESULTS FOR HAVING ANY PRESCRIPTIONS FILLED DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.328	0.122	2.690	0.007
part d	-0.176	0.068	-2.600	0.010
treatment * part d	-0.037	0.119	-0.310	0.753
black	-0.258	0.173	-1.500	0.135
black * treatment	-0.011	0.196	-0.060	0.954
black * part d	-0.131	0.171	-0.770	0.445
black * treatment * part d	0.139	0.284	0.490	0.625
hispanic	-0.307	0.186	-1.650	0.101
hispanic * treatment	0.268	0.186	1.440	0.150
hispanic * part d	-0.001	0.151	-0.010	0.995
hispanic * treatment * part d	-0.148	0.270	-0.550	0.584
age	0.022	0.006	3.680	0.000
female	0.573	0.048	11.860	0.000
poor/fair health	0.099	0.097	1.020	0.307
poor/fair mental health	-0.059	0.128	-0.460	0.644
pcs	-0.040	0.004	-11.390	0.000
mcs	-0.013	0.003	-4.260	0.000
function_index	-0.001	0.005	-0.220	0.827
chronic_index	0.179	0.045	3.970	0.000
diabetes	1.817	0.165	11.040	0.000
heart	0.784	0.118	6.670	0.000
asthma	0.617	0.137	4.510	0.000
arthritis	0.475	0.084	5.680	0.000
High blood pressure	1.625	0.081	20.050	0.000
stroke	0.327	0.173	1.890	0.059
married	0.335	0.063	5.350	0.000
less than high school	-0.306	0.081	-3.760	0.000
college and graduate	0.220	0.064	3.450	0.001
other degree	0.221	0.106	2.100	0.037
poor or near poor	0.171	0.097	1.760	0.079
middle income	0.304	0.079	3.860	0.000
high income	0.491	0.086	5.690	0.000
medicaid	0.262	0.115	2.270	0.024
private hmo	0.573	0.073	7.820	0.000
private non-hmo	0.550	0.063	8.680	0.000
exercise	-0.057	0.053	-1.090	0.278

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.497	0.063	-7.850	0.000
insurance not needed	-0.704	0.078	-9.080	0.000
insurance not worth cost	-0.281	0.059	-4.770	0.000
northeast	0.035	0.083	0.420	0.673
midwest	0.024	0.076	0.320	0.748
south	0.170	0.065	2.610	0.009
metropolitan area	0.002	0.062	0.040	0.971
english language	0.158	0.156	1.020	0.311
black * heart	-0.649	0.220	-2.960	0.003
black * hypertension	0.346	0.149	2.320	0.021
black * married	-0.390	0.148	-2.640	0.008
black * poor or near poor	-0.470	0.170	-2.760	0.006
hispanic * middle income	-0.221	0.144	-1.540	0.125
hispanic * high income	-0.340	0.175	-1.950	0.052
hispanic * college	0.509	0.250	2.040	0.042
hispanic * insurance not worth cost	0.335	0.156	2.150	0.032
intercept	0.714	0.517	1.380	0.168

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: F(52, 404)= 54.22 P < 0.0001

APPENDIX B3: GLM REGRESSION RESULTS FOR THE NUMBER OF PRESCRIPTIONS FILLED DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.010	0.032	0.320	0.750
part d	-0.032	0.026	-1.220	0.221
treatment * part d	0.057	0.033	1.750	0.081
black	-0.222	0.057	-3.910	0.000
black * treatment	0.084	0.056	1.510	0.133
black * part d	0.011	0.061	0.170	0.861
black * treatment * part d	-0.018	0.079	-0.220	0.824
hispanic	-0.136	0.054	-2.510	0.013
hispanic * treatment	0.039	0.061	0.650	0.517
hispanic * part d	-0.030	0.063	-0.480	0.631
hispanic * treatment * part d	0.089	0.078	1.140	0.253
age	0.002	0.001	1.380	0.169
female	0.153	0.014	10.830	0.000
poor/fair health	0.136	0.016	8.270	0.000
poor/fair mental health	0.004	0.022	0.190	0.852
pcs	-0.012	0.001	-17.280	0.000
mcs	-0.006	0.001	-10.050	0.000
function_index	0.004	0.001	5.410	0.000
chronic_index	0.046	0.008	5.500	0.000
diabetes	0.421	0.017	24.950	0.000
heart	0.234	0.020	11.780	0.000
asthma	0.169	0.022	7.680	0.000
arthritis	0.051	0.018	2.910	0.004
High blood pressure	0.403	0.016	25.410	0.000
stroke	0.072	0.023	3.060	0.002
married	-0.020	0.015	-1.280	0.200
less than high school	0.007	0.017	0.400	0.688
college and graduate	0.011	0.018	0.650	0.515
other degree	0.012	0.030	0.400	0.691
poor or near poor	0.008	0.020	0.400	0.690
middle income	0.011	0.017	0.600	0.546
high income	0.008	0.019	0.400	0.689
medicaid	0.246	0.029	8.580	0.000
private hmo	0.037	0.024	1.550	0.122
private non-hmo	0.040	0.018	2.220	0.027

Continued

Explanatory Variables	β	SE	t	P > t
exercise	-0.069	0.014	-5.010	0.000
smoker	-0.036	0.020	-1.820	0.070
insurance not needed	-0.190	0.031	-6.040	0.000
insurance not worth the cost	-0.108	0.016	-6.700	0.000
northeast	0.065	0.027	2.400	0.017
midwest	0.139	0.028	4.950	0.000
south	0.115	0.024	4.860	0.000
metropolitan area	-0.022	0.024	-0.940	0.350
english language	0.134	0.039	3.410	0.001
black * female	-0.117	0.038	-3.040	0.002
black * exercise	0.118	0.033	3.570	0.000
black * metropolitan area	0.080	0.041	1.960	0.050
intercept	3.006	0.116	26.030	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=32278, Wald-test of null that all parameters are 0: F(47, 409) = 188.23 P < 0.0001
Boxcox-test to find the appropriate link function: θ =.239, SE=.004, CI=0.231-0.247
Coefficient of dispersion: α= .541, SE= 0.007, CI= 0.527-0.555

APPENDIX B4: GLM REGRESSION RESULTS FOR THE TOTAL EXPENDITURE OF PRESCRIPTION DRUGS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.081	0.039	2.100	0.036
part d	0.042	0.040	1.050	0.293
treatment * part d	0.019	0.054	0.350	0.729
black	-0.550	0.088	-6.280	0.000
black * treatment	0.144	0.072	1.990	0.048
black * part d	0.057	0.080	0.710	0.479
black * treatment * part d	-0.100	0.102	-0.970	0.330
hispanic	-0.277	0.091	-3.040	0.003
hispanic * treatment	0.125	0.094	1.330	0.184
hispanic * part d	-0.177	0.113	-1.570	0.117
hispanic * treatment * part d	0.138	0.131	1.050	0.294
age	-0.002	0.002	-1.280	0.200
female	0.081	0.018	4.420	0.000
poor/fair health	0.184	0.034	5.430	0.000
poor/fair mental health	0.028	0.035	0.810	0.421
pcs	-0.015	0.001	-13.800	0.000
mcs	-0.007	0.001	-8.040	0.000
function_index	0.002	0.001	1.540	0.124
chronic_index	0.038	0.016	2.280	0.023
diabetes	0.414	0.024	17.090	0.000
heart	0.237	0.048	4.950	0.000
asthma	0.306	0.078	3.920	0.000
arthritis	0.048	0.024	1.970	0.049
High blood pressure	0.271	0.027	10.190	0.000
stroke	0.111	0.039	2.830	0.005
married	0.020	0.023	0.890	0.376
less than high school	-0.066	0.027	-2.440	0.015
college and graduate	0.054	0.027	2.000	0.046
other degree	0.016	0.041	0.390	0.698
poor or near poor	-0.036	0.044	-0.820	0.411
middle income	0.037	0.044	0.820	0.412
high income	0.046	0.041	1.100	0.272
medicaid	0.297	0.043	6.970	0.000
private hmo	0.070	0.037	1.910	0.057
private non-hmo	0.145	0.029	5.050	0.000
exercise	-0.082	0.025	-3.330	0.001

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.084	0.028	-3.030	0.003
insurance not needed	-0.243	0.042	-5.750	0.000
insurance not worth the cost	-0.168	0.025	-6.810	0.000
northeast	0.168	0.041	4.100	0.000
midwest	0.140	0.037	3.820	0.000
south	0.145	0.032	4.490	0.000
metropolitan area	0.049	0.030	1.630	0.104
english language	0.200	0.059	3.360	0.001
black * diabetes	0.141	0.050	2.820	0.005
black * high blood pressure	0.169	0.074	2.270	0.024
black * exercise	0.161	0.050	3.230	0.001
black * insurance not needed	0.288	0.143	2.020	0.044
black * insurance not worth cost	0.104	0.060	1.730	0.085
hispanic * diabetes	0.140	0.065	2.170	0.031
hispanic * private hmo	0.279	0.117	2.390	0.017
hispanic * private non-hmo	0.117	0.077	1.530	0.128
intercept	7.607	0.185	41.150	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive drug expenditure.
n=32278, Wald-test of null that all parameters are 0: F (52, 404) = 96.67 $p < 0.0001$
Boxcox-test to find the appropriate link function: θ=0.214, SE=0.003, CI=0.208-0.220
Modified Park-test to find the appropriate distribution family: λ=1.839,
SE=0.348, CI=1.154-2.524

APPENDIX B5: GLM REGRESSION RESULTS FOR THE OUT-OF-POCKET COST OF PRESCRIPTION DRUGS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.282	0.042	6.700	0.000
part d	-0.172	0.040	-4.330	0.000
treatment * part d	-0.313	0.050	-6.270	0.000
black	-0.195	0.078	-2.490	0.013
black * treatment	0.100	0.076	1.320	0.188
black * part d	0.042	0.084	0.500	0.616
black * treatment * part d	-0.171	0.110	-1.550	0.121
hispanic	-0.059	0.095	-0.620	0.536
hispanic * treatment	-0.131	0.113	-1.160	0.247
hispanic * part d	-0.321	0.101	-3.170	0.002
hispanic * treatment * part d	0.167	0.150	1.110	0.267
age	0.002	0.002	1.250	0.212
female	0.207	0.020	10.110	0.000
poor/fair health	0.139	0.030	4.580	0.000
poor/fair mental health	-0.001	0.036	-0.010	0.989
pcs	-0.013	0.001	-11.580	0.000
mcs	-0.006	0.001	-5.330	0.000
function_index	0.002	0.001	1.930	0.054
chronic_index	0.036	0.014	2.600	0.010
diabetes	0.389	0.028	13.700	0.000
heart	0.183	0.031	5.890	0.000
asthma	0.166	0.037	4.520	0.000
arthritis	0.031	0.030	1.050	0.293
High blood pressure	0.344	0.027	12.840	0.000
stroke	0.114	0.036	3.200	0.001
married	-0.003	0.027	-0.120	0.901
less than high school	-0.034	0.025	-1.340	0.180
college and graduate	0.084	0.029	2.860	0.004
other degree	0.054	0.050	1.080	0.280
poor or near poor	-0.020	0.033	-0.600	0.548
middle income	0.018	0.032	0.580	0.565
high income	0.017	0.030	0.560	0.576
medicaid	-0.784	0.070	-11.160	0.000
private hmo	-0.293	0.035	-8.450	0.000
private non-hmo	-0.114	0.030	-3.760	0.000
exercise	-0.068	0.022	-3.120	0.002

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.073	0.028	-2.580	0.010
insurance not needed	-0.178	0.048	-3.720	0.000
insurance not worth the cost	-0.090	0.024	-3.820	0.000
northeast	0.091	0.041	2.230	0.027
midwest	0.114	0.040	2.840	0.005
south	0.189	0.037	5.120	0.000
metropolitan area	-0.065	0.036	-1.820	0.070
english language	-0.053	0.060	-0.870	0.382
black * heart	-0.108	0.055	-1.960	0.050
black * artheritis	-0.149	0.066	-2.280	0.023
black * exercise	0.103	0.049	2.090	0.038
hispanic * diabetes	0.205	0.088	2.320	0.021
hispanic * asthma	-0.236	0.098	-2.410	0.016
intercept	6.715	0.192	34.890	0.000

Source: Data are from the household component file of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive out-of-pocket drug expenditure.
n=31658, Wald-test of null that all parameters are 0: F (49, 407) = 84.83 $p < 0.0001$
Boxcox-test to find the appropriate link function: θ=0.144 , SE=0.003, CI=0.138- 0.150
Modified Park-test to find the appropriate distribution family: λ=1.450,
SE=0.087, CI=1.275-1.617

APPENDIX B6: LOGIT REGRESSION RESULTS FOR HAVING ANY HOSPITALIZATIONS DURING THE PAST YEAR:02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.087	0.086	1.010	0.313
part d	-0.202	0.077	-2.630	0.009
treatment * part d	0.095	0.093	1.020	0.310
black	-0.090	0.175	-0.510	0.607
black * treatment	0.114	0.201	0.570	0.572
black * part d	0.462	0.204	2.270	0.024
black * treatment * part d	-0.433	0.248	-1.750	0.081
hispanic	-0.373	0.220	-1.690	0.091
hispanic * treatment	0.507	0.198	2.560	0.011
hispanic * part d	0.448	0.205	2.180	0.029
hispanic * treatment * part d	-0.508	0.266	-1.910	0.056
age	0.015	0.004	3.950	0.000
female	-0.112	0.043	-2.600	0.010
poor/fair health	0.208	0.055	3.770	0.000
poor/fair mental health	-0.227	0.066	-3.430	0.001
pcs	-0.037	0.002	-15.750	0.000
mcs	-0.012	0.002	-5.960	0.000
function_index	0.002	0.002	0.840	0.399
chronic_index	0.009	0.027	0.340	0.734
diabetes	0.133	0.055	2.430	0.015
heart	0.638	0.060	10.570	0.000
asthma	0.165	0.067	2.460	0.014
arthritis	0.062	0.056	1.110	0.269
High blood pressure	0.167	0.050	3.360	0.001
stroke	0.402	0.081	4.970	0.000
married	-0.084	0.045	-1.860	0.063
less than high school	-0.034	0.060	-0.570	0.568
college and graduate	-0.023	0.058	-0.400	0.688
other degree	0.137	0.084	1.630	0.103
poor or near poor	-0.071	0.065	-1.100	0.271
middle income	-0.066	0.059	-1.120	0.265
high income	-0.041	0.065	-0.630	0.530
medicaid	0.098	0.070	1.380	0.167
private hmo	0.035	0.071	0.490	0.623
private non-hmo	0.051	0.048	1.070	0.283

Continued

Explanatory Variables	β	SE	t	P > t
exercise	-0.156	0.043	-3.630	0.000
smoker	-0.075	0.061	-1.230	0.218
insurance not needed	-0.217	0.108	-2.020	0.044
insurance not worth the cost	-0.273	0.059	-4.630	0.000
northeast	0.074	0.062	1.200	0.231
midwest	0.174	0.061	2.870	0.004
south	0.159	0.058	2.730	0.007
metropolitan area	-0.011	0.047	-0.230	0.816
english language	-0.070	0.112	-0.620	0.533
black * arthritis	-0.149	0.116	-1.280	0.200
black * college	0.420	0.142	2.950	0.003
black * private hmo	-0.366	0.199	-1.840	0.066
black * insurance not needed	0.521	0.236	2.200	0.028
hispanic * poor health	-0.183	0.115	-1.590	0.112
hispanic * private hmo	0.284	0.184	1.550	0.123
Hispanic * insurance not worth cost	0.217	0.139	1.560	0.120
Hispanic * metropolitan area	-0.343	0.173	-1.980	0.048
intercept	-1.017	0.363	-2.800	0.005

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: $F(52, 404) = 49.87$ $P < 0.0001$

APPENDIX B7: LOGIT REGRESSION RESULTS FOR HAVING ANY EMERGENCY DEPARTMENT VISITS DURING THE PAST YEAR:02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.047	0.087	0.540	0.588
part d	-0.133	0.075	-1.760	0.078
treatment * part d	-0.003	0.092	-0.040	0.972
black	-0.121	0.161	-0.750	0.452
black * treatment	-0.159	0.167	-0.950	0.340
black * part d	0.236	0.172	1.370	0.173
black * treatment * part d	0.008	0.210	0.040	0.969
hispanic	0.057	0.124	0.460	0.645
hispanic * treatment	-0.181	0.166	-1.090	0.278
hispanic * part d	-0.134	0.154	-0.870	0.384
hispanic * treatment * part d	0.150	0.225	0.670	0.505
age	0.009	0.004	2.450	0.015
female	0.094	0.041	2.310	0.021
poor/fair health	0.132	0.049	2.680	0.008
poor/fair mental health	-0.127	0.065	-1.950	0.052
pcs	-0.022	0.002	-10.960	0.000
mcs	-0.014	0.002	-7.750	0.000
function_index	0.002	0.002	1.060	0.290
chronic_index	0.057	0.022	2.570	0.011
diabetes	0.008	0.052	0.150	0.880
heart	0.457	0.054	8.530	0.000
asthma	0.197	0.060	3.280	0.001
arthritis	-0.070	0.052	-1.350	0.178
High blood pressure	0.036	0.047	0.770	0.443
stroke	0.389	0.071	5.440	0.000
married	-0.074	0.043	-1.730	0.084
less than high school	0.037	0.051	0.730	0.465
college and graduate	-0.029	0.057	-0.500	0.617
other degree	0.020	0.076	0.270	0.791
poor or near poor	-0.053	0.056	-0.940	0.347
middle income	-0.081	0.052	-1.570	0.117
high income	-0.094	0.057	-1.650	0.099
medicaid	0.120	0.068	1.760	0.080
private hmo	0.060	0.062	0.970	0.333
private non-hmo	-0.002	0.047	-0.040	0.969
exercise	-0.137	0.040	-3.380	0.001

Continued

Explanatory Variables	β	SE	t	P > t
smoker	0.020	0.053	0.380	0.705
insurance not needed	-0.138	0.091	-1.520	0.130
insurance not worth cost	-0.133	0.045	-2.940	0.003
northeast	0.139	0.060	2.310	0.021
mid west	0.191	0.061	3.130	0.002
south	0.014	0.055	0.250	0.800
metropolitan area	0.025	0.052	0.480	0.633
english language	0.281	0.100	2.820	0.005
black * female	0.200	0.095	2.100	0.036
black * poor health	-0.184	0.099	-1.860	0.063
black * south	0.251	0.099	2.540	0.012
hispanic * asthma	0.288	0.175	1.640	0.101
hispanic * exercise	0.283	0.097	2.910	0.004
intercept	-1.208	0.325	-3.720	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: $F(49, 407) = 36.72$ $P < 0.0001$

APPENDIX B8: GLM REGRESSION RESULTS FOR THE TOTAL HEALTH CARE COST DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.035	0.044	0.790	0.430
part d	0.073	0.040	1.810	0.071
treatment * part d	-0.105	0.049	-2.150	0.032
black	-0.330	0.114	-2.900	0.004
black * treatment	0.036	0.108	0.340	0.737
black * part d	0.060	0.124	0.490	0.628
black * treatment * part d	0.083	0.148	0.570	0.572
hispanic	-0.725	0.100	-7.220	0.000
hispanic * treatment	0.490	0.112	4.370	0.000
hispanic * part d	0.160	0.099	1.610	0.108
hispanic * treatment * part d	-0.142	0.143	-0.990	0.322
age	0.005	0.002	2.370	0.018
female	-0.026	0.023	-1.150	0.251
poor/fair health	0.186	0.032	5.740	0.000
poor/fair mental health	-0.068	0.040	-1.690	0.091
pcs	-0.026	0.001	-21.570	0.000
mcs	-0.008	0.001	-7.620	0.000
function_index	0.006	0.001	4.460	0.000
chronic_index	0.031	0.015	2.120	0.035
diabetes	0.159	0.032	4.930	0.000
heart	0.391	0.035	11.100	0.000
asthma	0.121	0.046	2.640	0.009
arthritis	0.070	0.028	2.470	0.014
High blood pressure	0.129	0.028	4.600	0.000
stroke	0.107	0.040	2.700	0.007
married	-0.017	0.023	-0.760	0.445
less than high school	-0.116	0.029	-3.950	0.000
college and graduate	0.103	0.028	3.700	0.000
other degree	0.085	0.045	1.870	0.062
poor or near poor	-0.028	0.037	-0.770	0.441
middle income	0.016	0.034	0.450	0.650
high income	0.098	0.036	2.740	0.006
medicaid	0.119	0.047	2.540	0.011
private hmo	0.071	0.036	1.970	0.049
private non-hmo	0.145	0.028	5.250	0.000
exercise	-0.060	0.024	-2.540	0.011

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.122	0.038	-3.210	0.001
insurance not needed	-0.214	0.050	-4.260	0.000
insurance not worth the cost	-0.218	0.025	-8.890	0.000
northeast	0.058	0.028	2.050	0.041
midwest	0.137	0.031	4.390	0.000
south	0.029	0.025	1.160	0.245
metropolitan area	0.086	0.024	3.530	0.000
english language	-0.007	0.070	-0.100	0.920
black * female	-0.119	0.078	-1.540	0.124
black * poor health	0.134	0.076	1.770	0.077
black * diabetes	0.151	0.075	2.000	0.046
black * stroke	0.193	0.081	2.390	0.017
black * non-hmo private insurance	0.213	0.082	2.600	0.010
black * northeast	0.274	0.116	2.360	0.019
hispanic * function_index	0.004	0.002	1.830	0.067
hispanic * high blood pressure	-0.108	0.071	-1.530	0.126
hispanic * medicaid	0.294	0.109	2.710	0.007
hispanic * private hmo	0.339	0.090	3.770	0.000
hispanic * non-hmo private insurance	0.351	0.105	3.330	0.001
intercept	9.475	0.190	49.880	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive drug expenditure.
n=34840, Wald-test of null that all parameters are 0: : F(55, 401) = 93.13 p < .0001
Boxcox-test to find the appropriate link function: θ=0.088, SE=0.003, CI=0.083-0.094
Modified Park-test to find the appropriate distribution family: λ=1.802,
SE=0.090, CI=1.626-1.978

APPENDIX B9: RDE LOGIT REGRESSION RESULTS FOR HAVING DRUG INSURANCE COVERAGE: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	-0.655	0.107	-6.100	0.000
part d	0.238	0.080	2.960	0.003
treatment * part d	1.861	0.127	14.700	0.000
black	-0.537	0.127	-4.240	0.000
black * treatment	0.623	0.159	3.920	0.000
black * part d	0.021	0.152	0.140	0.890
black * treatment * part d	0.128	0.231	0.550	0.580
hispanic	-0.945	0.135	-7.010	0.000
hispanic * treatment	1.381	0.197	7.010	0.000
hispanic * part d	0.335	0.157	2.130	0.034
hispanic * treatment * part d	-0.105	0.309	-0.340	0.735
age	0.000	0.006	0.010	0.994
female	-0.423	0.046	-9.160	0.000
poor/fair health	0.025	0.071	0.350	0.730
poor/fair mental health	0.066	0.082	0.810	0.419
pcs	-0.009	0.003	-3.060	0.002
mcs	0.000	0.002	-0.160	0.871
function_index	0.003	0.003	1.000	0.317
chronic_index	0.125	0.036	3.450	0.001
diabetes	0.583	0.075	7.810	0.000
heart	0.085	0.078	1.090	0.278
asthma	0.380	0.095	4.000	0.000
arthritis	0.125	0.070	1.780	0.076
High blood pressure	0.480	0.066	7.320	0.000
stroke	-0.096	0.096	-1.000	0.320
married	0.247	0.052	4.730	0.000
less than high school	-0.239	0.061	-3.900	0.000
college and graduate	0.150	0.073	2.050	0.041
other degree	0.027	0.105	0.250	0.801
poor or near poor	-0.083	0.064	-1.290	0.198
middle income	0.212	0.066	3.230	0.001
high income	0.460	0.077	5.980	0.000
medicaid	2.254	0.130	17.340	0.000
private hmo	2.829	0.102	27.740	0.000
private non-hmo	1.908	0.075	25.430	0.000
exercise	0.005	0.046	0.100	0.921

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.183	0.070	-2.630	0.009
Insurance not needed	-0.617	0.080	-7.690	0.000
insurance not worth cost	-0.389	0.052	-7.540	0.000
northeast	-0.004	0.105	-0.030	0.973
midwest	-0.147	0.087	-1.700	0.091
south	-0.159	0.078	-2.050	0.041
metropolitan area	0.376	0.068	5.550	0.000
english language	0.480	0.123	3.900	0.000
intercept	-0.399	0.449	-0.890	0.375

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: F(44, 412)= 77.00 P < 0.0001

APPENDIX B10: RDE LOGIT REGRESSION RESULTS FOR HAVING ANY PRESCRIPTIONS FILLED DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.329	0.121	2.710	0.007
part d	-0.177	0.068	-2.620	0.009
treatment * part d	-0.037	0.119	-0.310	0.754
black	-0.493	0.130	-3.780	0.000
black * treatment	-0.035	0.190	-0.180	0.854
black * part d	-0.086	0.168	-0.510	0.609
black * treatment * part d	0.141	0.279	0.510	0.612
hispanic	-0.346	0.142	-2.440	0.015
hispanic * treatment	0.276	0.189	1.460	0.144
hispanic * part d	0.002	0.157	0.010	0.992
hispanic * treatment * part d	-0.171	0.276	-0.620	0.537
age	0.022	0.006	3.670	0.000
female	0.574	0.048	11.880	0.000
poor/fair health	0.103	0.097	1.070	0.285
poor/fair mental health	-0.051	0.127	-0.400	0.690
pcs	-0.040	0.004	-11.370	0.000
mcs	-0.012	0.003	-4.140	0.000
function_index	-0.001	0.005	-0.250	0.805
chronic_index	0.181	0.045	4.020	0.000
diabetes	1.809	0.164	11.020	0.000
heart	0.732	0.113	6.500	0.000
asthma	0.610	0.137	4.470	0.000
arthritis	0.473	0.083	5.660	0.000
High blood pressure	1.660	0.077	21.470	0.000
stroke	0.318	0.172	1.840	0.066
married	0.304	0.059	5.130	0.000
less than high school	-0.318	0.081	-3.950	0.000
college and graduate	0.243	0.062	3.920	0.000
other degree	0.219	0.105	2.080	0.038
poor or near poor	0.113	0.092	1.230	0.218
middle income	0.272	0.076	3.580	0.000
high income	0.456	0.084	5.410	0.000
medicaid	0.265	0.116	2.290	0.023
private hmo	0.570	0.073	7.800	0.000
private non-hmo	0.549	0.063	8.650	0.000
exercise	-0.057	0.053	-1.070	0.283

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.494	0.063	-7.820	0.000
insurance not needed	-0.707	0.077	-9.120	0.000
insurance not worth the cost	-0.249	0.056	-4.430	0.000
northeast	0.041	0.083	0.490	0.621
midwest	0.032	0.076	0.420	0.678
south	0.179	0.065	2.770	0.006
metropolitan area	0.006	0.062	0.100	0.917
english language	0.096	0.147	0.650	0.513
intercept	0.778	0.509	1.530	0.127

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: F(44, 412)= 63.08 P < 0.0001

APPENDIX B11: RDE GLM REGRESSION RESULTS FOR THE NUMBER OF PRESCRIPTIONS FILLED DURING THE PAST YEAR:02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.012	0.032	0.380	0.705
part d	-0.031	0.026	-1.210	0.226
treatment * part d	0.057	0.033	1.750	0.081
black	-0.163	0.045	-3.640	0.000
black * treatment	0.067	0.057	1.180	0.237
black * part d	0.021	0.062	0.340	0.731
black * treatment * part d	-0.022	0.080	-0.280	0.781
hispanic	-0.136	0.054	-2.510	0.013
hispanic * treatment	0.040	0.061	0.660	0.511
hispanic * part d	-0.031	0.063	-0.500	0.618
hispanic * treatment * part d	0.090	0.078	1.160	0.248
age	0.002	0.001	1.360	0.176
female	0.143	0.014	10.610	0.000
poor/fair health	0.135	0.017	8.170	0.000
poor/fair mental health	0.004	0.022	0.160	0.869
pcs	-0.012	0.001	-17.350	0.000
mcs	-0.006	0.001	-10.120	0.000
function_index	0.004	0.001	5.390	0.000
chronic_index	0.046	0.008	5.520	0.000
diabetes	0.420	0.017	24.920	0.000
heart	0.233	0.020	11.700	0.000
asthma	0.168	0.022	7.610	0.000
arthritis	0.050	0.018	2.820	0.005
High blood pressure	0.402	0.016	25.390	0.000
stroke	0.071	0.024	3.040	0.003
married	-0.020	0.015	-1.300	0.196
less than high school	0.006	0.017	0.340	0.736
college and graduate	0.009	0.018	0.540	0.591
other degree	0.012	0.030	0.400	0.692
poor or near poor	0.007	0.020	0.350	0.728
middle income	0.010	0.017	0.590	0.556
high income	0.007	0.019	0.370	0.711
medicaid	0.241	0.029	8.380	0.000
private hmo	0.038	0.024	1.590	0.114
private non-hmo	0.040	0.018	2.220	0.027
exercise	-0.059	0.013	-4.500	0.000

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.035	0.020	-1.720	0.086
Insurance not needed	-0.191	0.031	-6.090	0.000
insurance not worth cost	-0.108	0.016	-6.730	0.000
northeast	0.065	0.027	2.420	0.016
midwest	0.139	0.028	4.980	0.000
south	0.114	0.024	4.830	0.000
methropolitan area	-0.017	0.023	-0.770	0.441
english language	0.132	0.039	3.370	0.001
intercept	3.012	0.115	26.120	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=32278, Wald-test of null that all parameters are 0: F(44, 412) = 202.19 P < 0.0001
Boxcox-test to find the appropriate link function: θ =.240, SE=.004, CI=0.232-0.248
Coefficient of dispersion: α= .542, SE= 0.007, CI= 0.529-0.556

APPENDIX B12: RDE GLM REGRESSION RESULTS FOR THE TOTAL EXPENDITURE OF PRESCRIPTION DRUGS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.087	0.039	2.250	0.025
part d	0.042	0.040	1.040	0.300
treatment * part d	0.018	0.054	0.330	0.744
black	-0.274	0.057	-4.840	0.000
black * treatment	0.139	0.074	1.880	0.061
black * part d	0.065	0.081	0.800	0.424
black * treatment * part d	-0.078	0.106	-0.730	0.463
hispanic	-0.102	0.073	-1.380	0.167
hispanic * treatment	0.045	0.089	0.510	0.612
hispanic * part d	-0.159	0.116	-1.370	0.172
hispanic * treatment * part d	0.127	0.134	0.950	0.341
age	-0.002	0.002	-1.340	0.180
female	0.083	0.019	4.490	0.000
poor/fair health	0.183	0.034	5.380	0.000
poor/fair mental health	0.030	0.035	0.840	0.401
pcs	-0.015	0.001	-13.750	0.000
mcs	-0.007	0.001	-7.940	0.000
function_index	0.002	0.001	1.510	0.132
chronic_index	0.036	0.017	2.190	0.029
diabetes	0.445	0.023	19.760	0.000
heart	0.239	0.049	4.930	0.000
asthma	0.306	0.079	3.870	0.000
arthritis	0.050	0.024	2.050	0.041
High blood pressure	0.280	0.026	10.940	0.000
stroke	0.113	0.039	2.880	0.004
married	0.020	0.023	0.880	0.382
less than high school	-0.069	0.027	-2.510	0.012
college and graduate	0.053	0.027	1.950	0.052
other degree	0.016	0.042	0.380	0.703
poor or near poor	-0.037	0.045	-0.820	0.413
middle income	0.038	0.045	0.860	0.392
high income	0.046	0.042	1.100	0.273
medicaid	0.291	0.043	6.840	0.000
private hmo	0.087	0.035	2.480	0.014
private non-hmo	0.152	0.028	5.450	0.000
exercise	-0.067	0.023	-2.920	0.004

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.081	0.028	-2.940	0.003
insurance not needed	-0.218	0.040	-5.390	0.000
insurance not worth cost	-0.158	0.024	-6.720	0.000
northeast	0.169	0.041	4.070	0.000
midwest	0.138	0.037	3.780	0.000
south	0.143	0.032	4.410	0.000
metropolitan area	0.049	0.030	1.620	0.107
english language	0.238	0.058	4.120	0.000
intercept	7.547	0.185	40.820	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive drug expenditure.
n=32278, Wald-test of null that all parameters are 0: F (44, 412) = 108.75 $p < 0.0001$
Boxcox-test to find the appropriate link function: θ=0.214, SE=0.003, CI=0.208-0.220
Modified Park-test to find the appropriate distribution family: λ=1.800,
SE=0.337, CI=1.136-2.459

APPENDIX B13: RDE GLM REGRESSION RESULTS FOR THE OUT-OF-POCKET COST OF PRESCRIPTION DRUGS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.286	0.042	6.800	0.000
part d	-0.173	0.040	-4.370	0.000
treatment * part d	-0.312	0.050	-6.270	0.000
black	-0.226	0.065	-3.450	0.001
black * treatment	0.051	0.079	0.650	0.519
black * part d	0.041	0.085	0.490	0.626
black * treatment * part d	-0.175	0.112	-1.560	0.120
hispanic	-0.031	0.089	-0.350	0.727
hispanic * treatment	-0.133	0.111	-1.200	0.229
hispanic * part d	-0.297	0.106	-2.810	0.005
hispanic * treatment * part d	0.161	0.151	1.070	0.286
age	0.002	0.002	1.220	0.224
female	0.204	0.021	9.900	0.000
poor/fair health	0.139	0.031	4.540	0.000
poor/fair mental health	-0.005	0.037	-0.140	0.887
pcs	-0.013	0.001	-11.530	0.000
mcs	-0.006	0.001	-5.330	0.000
function_index	0.002	0.001	1.800	0.072
chronic_index	0.036	0.014	2.550	0.011
diabetes	0.410	0.027	14.940	0.000
heart	0.175	0.030	5.770	0.000
asthma	0.150	0.036	4.190	0.000
arthritis	0.019	0.029	0.650	0.516
High blood pressure	0.345	0.027	12.830	0.000
stroke	0.112	0.036	3.130	0.002
married	-0.004	0.027	-0.150	0.880
less than high school	-0.035	0.025	-1.380	0.167
college and graduate	0.083	0.029	2.830	0.005
other degree	0.053	0.050	1.070	0.285
poor or near poor	-0.021	0.034	-0.620	0.535
middle income	0.018	0.032	0.570	0.571
high income	0.015	0.030	0.490	0.623
medicaid	-0.788	0.070	-11.290	0.000
private hmo	-0.293	0.035	-8.460	0.000
private non-hmo	-0.114	0.030	-3.740	0.000
exercise	-0.059	0.021	-2.850	0.005

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.072	0.028	-2.540	0.011
insurance not needed	-0.177	0.048	-3.670	0.000
insurance not worth the cost	-0.090	0.024	-3.790	0.000
northeast	0.089	0.041	2.160	0.031
midwest	0.111	0.040	2.780	0.006
south	0.185	0.037	5.030	0.000
metropolitan area	-0.065	0.036	-1.790	0.075
english language	-0.066	0.062	-1.070	0.285
intercept	6.746	0.195	34.650	0.000

Source: Data are from the household component file of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive out-of-pocket drug expenditure.
n=31658, Wald-test of null that all parameters are 0: F (44, 412) = 92.70 $p < 0.0001$
Boxcox-test to find the appropriate link function: θ=0.144, SE=0.003, CI=0.138-0.150
Modified Park-test to find the appropriate distribution family: λ=1.440,
SE=0.088, CI=1.260-1.605

APPENDIX B14: RDE LOGIT REGRESSION RESULTS FOR HAVING ANY HOSPITALIZATIONS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.091	0.085	1.080	0.281
part d	-0.204	0.077	-2.650	0.008
treatment * part d	0.096	0.093	1.040	0.299
black	-0.140	0.152	-0.920	0.358
black * treatment	0.122	0.195	0.620	0.533
black * part d	0.489	0.202	2.420	0.016
black * treatment * part d	-0.463	0.248	-1.870	0.062
hispanic	-0.617	0.146	-4.240	0.000
hispanic * treatment	0.421	0.191	2.200	0.028
hispanic * part d	0.441	0.206	2.150	0.032
hispanic * treatment * part d	-0.506	0.269	-1.880	0.060
age	0.015	0.004	3.930	0.000
female	-0.111	0.043	-2.570	0.010
poor/fair health	0.197	0.053	3.690	0.000
poor/fair mental health	-0.231	0.066	-3.470	0.001
pcs	-0.037	0.002	-15.770	0.000
mcs	-0.012	0.002	-5.970	0.000
function_index	0.002	0.002	0.790	0.432
chronic_index	0.010	0.027	0.360	0.720
diabetes	0.132	0.055	2.420	0.016
heart	0.638	0.060	10.560	0.000
asthma	0.163	0.067	2.430	0.015
arthritis	0.047	0.055	0.850	0.396
High blood pressure	0.166	0.050	3.340	0.001
stroke	0.402	0.081	4.980	0.000
married	-0.085	0.045	-1.890	0.059
less than high school	-0.039	0.060	-0.640	0.521
college and graduate	0.006	0.055	0.110	0.914
other degree	0.139	0.084	1.650	0.100
poor or near poor	-0.075	0.065	-1.150	0.251
middle income	-0.066	0.059	-1.110	0.266
high income	-0.042	0.065	-0.660	0.512
medicaid	0.086	0.069	1.240	0.216
private hmo	0.021	0.064	0.320	0.747
private non-hmo	0.053	0.048	1.110	0.267
exercise	-0.158	0.043	-3.690	0.000

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.072	0.061	-1.180	0.239
insurance not needed	-0.152	0.096	-1.580	0.116
insurance not worth cost	-0.258	0.056	-4.640	0.000
northeast	0.075	0.062	1.210	0.225
midwest	0.174	0.060	2.880	0.004
south	0.160	0.058	2.750	0.006
metropolitan area	-0.021	0.046	-0.470	0.639
english language	-0.049	0.112	-0.440	0.664
intercept	-1.017	0.364	-2.790	0.005

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: F(44, 412)= 57.86 P < 0.0001

APPENDIX B15: RDE LOGIT REGRESSION RESULTS FOR HAVING ANY EMERGENCY DEPARTMENT VISITS DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.050	0.087	0.580	0.565
part d	-0.132	0.075	-1.750	0.080
treatment * part d	-0.004	0.092	-0.040	0.967
black	0.075	0.138	0.540	0.589
black * treatment	-0.165	0.170	-0.970	0.332
black * part d	0.241	0.175	1.380	0.168
black * treatment * part d	0.014	0.212	0.070	0.946
hispanic	0.234	0.118	1.980	0.049
hispanic * treatment	-0.200	0.166	-1.200	0.231
hispanic * part d	-0.132	0.153	-0.860	0.390
hispanic * treatment * part d	0.142	0.222	0.640	0.524
age	0.009	0.004	2.430	0.015
female	0.110	0.039	2.860	0.004
poor/fair health	0.111	0.047	2.380	0.018
poor/fair mental health	-0.130	0.065	-1.990	0.047
pcs	-0.022	0.002	-10.960	0.000
mcs	-0.014	0.002	-7.720	0.000
function_index	0.002	0.002	1.090	0.276
chronic_index	0.059	0.022	2.640	0.009
diabetes	0.007	0.052	0.130	0.898
heart	0.455	0.054	8.480	0.000
asthma	0.213	0.058	3.700	0.000
arthritis	-0.069	0.052	-1.340	0.180
High blood pressure	0.036	0.046	0.770	0.444
stroke	0.388	0.071	5.430	0.000
married	-0.078	0.043	-1.830	0.068
less than high school	0.035	0.051	0.700	0.486
college and graduate	-0.028	0.057	-0.490	0.625
other degree	0.020	0.076	0.260	0.792
poor or near poor	-0.054	0.056	-0.960	0.339
middle income	-0.080	0.052	-1.550	0.121
high income	-0.094	0.056	-1.660	0.097
medicaid	0.114	0.068	1.670	0.096
private hmo	0.066	0.062	1.060	0.288
private non-hmo	0.000	0.047	0.000	0.998
exercise	-0.119	0.039	-3.090	0.002

Continued

Explanatory Variables	β	SE	t	P > t
smoker	0.016	0.053	0.310	0.759
insurance not needed	-0.138	0.091	-1.520	0.129
insurance not worth the cost	-0.133	0.045	-2.930	0.004
northeast	0.134	0.060	2.240	0.026
mid west	0.186	0.061	3.040	0.002
south	0.038	0.054	0.710	0.478
metropolitan area	0.018	0.052	0.350	0.726
english language	0.298	0.099	3.020	0.003
intercept	-1.242	0.324	-3.830	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic.
n=36,902, Wald-test of null that all parameters are 0: F(44, 412)= 40.53 P < 0.0001

APPENDIX B16: RDE GLM REGRESSION RESULTS FOR THE TOTAL HEALTH CARE COST DURING THE PAST YEAR: 02-09

Explanatory Variables	β	SE	t	P > t
treatment	0.039	0.044	0.870	0.386
part d	0.071	0.040	1.790	0.075
treatment * part d	-0.101	0.049	-2.060	0.040
black	-0.196	0.090	-2.190	0.029
black * treatment	0.043	0.109	0.390	0.695
black * part d	0.119	0.146	0.820	0.415
black * treatment * part d	0.038	0.168	0.230	0.820
hispanic	-0.481	0.075	-6.390	0.000
hispanic * treatment	0.411	0.109	3.790	0.000
hispanic * part d	0.143	0.103	1.390	0.166
hispanic * treatment * part d	-0.147	0.149	-0.990	0.324
age	0.005	0.002	2.440	0.015
female	-0.037	0.022	-1.660	0.098
poor/fair health	0.201	0.033	6.070	0.000
poor/fair mental health	-0.069	0.040	-1.750	0.081
pcs	-0.026	0.001	-21.160	0.000
mcs	-0.008	0.001	-7.390	0.000
function_index	0.006	0.001	5.050	0.000
chronic_index	0.032	0.015	2.170	0.031
diabetes	0.174	0.029	5.930	0.000
heart	0.386	0.035	11.020	0.000
asthma	0.121	0.046	2.630	0.009
arthritis	0.068	0.029	2.390	0.017
High blood pressure	0.122	0.027	4.470	0.000
stroke	0.128	0.037	3.430	0.001
married	-0.014	0.023	-0.630	0.529
less than high school	-0.125	0.029	-4.240	0.000
college and graduate	0.097	0.028	3.450	0.001
other degree	0.083	0.045	1.830	0.069
poor or near poor	-0.032	0.037	-0.880	0.378
middle income	0.014	0.035	0.400	0.691
high income	0.100	0.036	2.770	0.006
medicaid	0.171	0.042	4.040	0.000
private hmo	0.091	0.034	2.650	0.008
private non-hmo	0.179	0.026	6.880	0.000
exercise	-0.057	0.024	-2.390	0.017

Continued

Explanatory Variables	β	SE	t	P > t
smoker	-0.120	0.038	-3.140	0.002
insurance not needed	-0.217	0.050	-4.320	0.000
insurance not worth the cost	-0.217	0.025	-8.780	0.000
northeast	0.082	0.029	2.820	0.005
midwest	0.136	0.031	4.350	0.000
south	0.022	0.026	0.860	0.391
metropolitan area	0.087	0.025	3.530	0.000
english language	0.036	0.073	0.490	0.624
intercept	9.375	0.197	47.510	0.000

Source: Data are from the household component files of the 2002-2009 MEPS.
Note: Estimates are for near-elderly non-Medicare beneficiaries ages 55-63 and Medicare beneficiaries ages 65 and older, who self-report being White, African-American, or Hispanic with a positive drug expenditure.
n=34840, Wald-test of null that all parameters are 0: : F(44, 412) = 104.60 p < .0001
Boxcox-test to find the appropriate link function: θ=0.089, SE=0.003, CI=0.084-0.094
Modified Park-test to find the appropriate distribution family: λ=1.774,
SE=0.090, CI=1.598-1.950

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ABSTRACT

AN EXAMINATION OF THE EFFECTS OF MEDICARE PART D ON RACIAL/ETHNIC DISPARITIES

by

ELHAM MAHMOUDI

August 2012

Advisor: Gail Jensen Summers

Major: Economics

Degree: Doctor of Philosophy

This dissertation seeks to evaluate whether Medicare Part D has reduced racial/ethnic disparities in prescription drug utilization and spending among Medicare seniors. Using nationally representative data on White, African-American, and Hispanic Medicare seniors from the 2002-2009 Medical Expenditure Panel Survey, this dissertation analyzes eight measures of access and utilization related to prescription medications. This dissertation applies the Institute of Medicine's definition of a racial/ethnic disparity, and adopts a difference-in-differences quasi-experimental design, using a multivariate regression framework. It finds strong evidence that Medicare Part D reduced ethnic disparities in prescription drug use, total prescription drug cost, out-of-pocket prescription drug cost, and prevalence of any emergency department visits between White and Hispanic seniors. However, it has little effect on disparities between White and African-American seniors. This dissertation finds that there still exist significant racial/ethnic disparities between White and minority seniors in prescription drugs utilization and spending.

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