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Final Report

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Monitoring Chronic Disease Care and Outcomes among Elderly Medicare Beneficiaries with Chronic Disease

Activity 3

Medication Use and Adherence among Medicare Beneficiaries with Diabetes and Selected Comorbidities Enrolled in Stand-Alone Part D Prescription Drug Plans

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Abstract

This report describes drug use and adherence with selected medications commonly prescribed to Medicare beneficiaries with diabetes. The study sample comprised 151,460 beneficiaries enrolled full year in Part D Prescription Drug Plans (PDPs) in 2006. We evaluated medications in three classes: oral and injected antidiabetic drugs, renin-angiotensin-aldosterone system inhibitors (RAASIs) a class comprising ACE-inhibitors and angiotensin II receptor blockers (ARBs), and antihyperlipidemics (AHLs) including statins and other lipid lowering agents. The outcome measures were any use of drugs within each class, duration of therapy, and medication possession ratios. To examine whether the generosity of the Part D benefit influenced medication utilization patterns, we computed drug adherence rates for subsamples with and without Part D low income subsidies (LIS). To test whether there was a correlation between drug utilization and illness burden, we examined medication adherence for subjects with concurrent COPD and/or major depression as well as by quintile of cumulative Medicare expenditures in 2006. Our major findings were: (1) low overall utilization rates for the evaluated medications, (2) strong negative association between illness burden and medication adherence, (3) lower drug prevalence rates among LIS enrollees, and (4) significant disparities in medication adherence between whites, blacks, and Hispanics.

Executive Summary

Introduction:

Approximately a quarter of all Medicare beneficiaries suffer from diabetes mellitus. Diabetes is a complex chronic disease resulting from insulin deficiency or failure of insulin action to control blood glucose levels. The disease can lead to loss of vision, heart problems, vascular and peripheral nerve dysfunction, kidney disease, and death. Traditional treatment guidelines stress education and patient self-management, tight control of hyperglycemia, and close physician monitoring and evaluation to prevent complications of the disease. Persons who require drug therapy for Type II diabetes (the most common type among the elderly) typically take oral antidiabetic drugs. Use of insulin alone or in combination with oral medications may be warranted as a last resort. Diabetes treatment guidelines also place emphasis on medications that may be necessary to control hypertension and help prevent kidney disease (renin-angiotensin-aldosterone system inhibitors or RAASIs) and high cholesterol levels (antihyperlipidemics or AHLDs).

Methods:

This report describes drug use and adherence with selected medications commonly prescribed to Medicare beneficiaries with diabetes. The current study builds upon prior analyses conducted by McBean, et al. (2008) of the characteristics, cost of treatment, and mortality among Medicare beneficiaries with diabetes and selected comorbidities. Our study sample comprised 151,460 beneficiaries enrolled in Part D Prescription Drug Plans (PDPs) in 2006. The sample was selected from the Chronic Condition Warehouse (CCW) 5% random sample of beneficiaries diagnosed with diabetes in 2004 and/or 2005. Other sample selection criteria included coverage for both Part A and B throughout 2006, continuously enrolled in a stand-alone Part D prescription drug plan (PDP) from January 1, 2006 through December 31, 2006, and complete data for prescription drug events (PDEs) and days supply of therapy for the following medications: oral and injected antidiabetic medications, renin-angiotensin-aldosterone system inhibitors (RAASIs) a class comprising ACE-inhibitors and angiotensin II receptor blockers (ARBs), and antihyperlipidemics (AHLDs) including statins and other lipid lowering agents. We used bivariate and multivariate analysis to assess 2006 utilization patterns for medications within each drug class using three measures: any use, duration of therapy (DOT), and medication possession ratio (MPR). To examine whether the generosity of the Part D benefit influenced medication utilization patterns, we computed drug adherence rates for the entire sample and subsamples with and without Part D low income subsidies (LIS). To test whether there was a correlation between drug utilization and illness burden, we examined medication adherence for subjects with concurrent COPD and/or major depression as well as by quintile of cumulative Medicare expenditures in 2006. We also conducted a series of within-sample and out-of-sample comparisons to assess the generalizability of the study findings.

Results:

The study results are presented in a series of detailed tables for bivariate cross-tabulations and multivariate regression results. Two-thirds of the PDP sample comprised LIS enrollees,

16.1% had comorbid COPD, and 19.4% had comorbid major depression. Prevalence of drug use was 70.7% for any antidiabetic agent, 64.7% for RAASIs, and 60.3% for AHLDs. Duration of therapy among drug users varied from a mean of 294 days (any antidiabetic agent), 284 days (RAASIs), and 275 days (AHLDs). MPR rates were high and showed little variation across the drug groups, ranging from a mean 88% for users of antidiabetic medications and AHLDs to 90% for RAASI users. In the multivariate regression models, LIS enrollment was strongly associated with lower prevalence of antidiabetic therapy (OR= 0.83; $p<.001$), RAASIs (OR= 0.76; $p<.001$), and antihyperlipidemics (OR= 0.69; $p<.001$), but slightly longer mean duration of therapy among users (5 to 12 days; all $p<.001$). LIS status had no effect on MPRs except for antihyperlipidemic agents where the impact was statistically significant but clinically unimportant (OR=0.01; $p<.001$). COPD and major depression were also strongly associated with lower prevalence of drug use with odds ratios ranging between 0.85 ($p<.001$) for antidiabetic drugs for beneficiaries with comorbid COPD to 0.62 ($p<.001$) for AHLD use for those with comorbid depression. Concomitant disease was associated with shorter mean DOTs (between 3 and 7 fewer days; all $p<.001$), but had no appreciable impact on MPRs. Race and ethnicity exerted a major impact on medication use and adherence for PDP enrollees with diabetes. Compared to whites, blacks had significantly lower odds of using any oral antidiabetic agent (OR=0.86, $p<.001$) and any AHLD (OR=0.75, $p<.001$). Hispanics had significantly higher odds of use of oral antidiabetic agents and RAASIs compared to whites ($p<.001$ in each case). However, duration of therapy and MPRs were significantly lower for both blacks and Hispanics across all three drug classes

Discussion:

These results should be interpreted in light of several study limitations. The findings are strictly generalizable only to beneficiaries continuously enrolled in PDPs in 2006. Since 2006 was the inaugural year for Part D, results for later years may differ. We were unable to compute representative medication adherence rates for beneficiaries enrolled in MA-PD plans, because the only MA-PD enrollees in our original sample had transferred from fee-for-service between 2004 and 2006 and were not like the MA-PD population at large. Finally, the study captured medication adherence for a single year, whereas treatment guidelines for diabetes recommend life-time therapy for individuals with indications for these drugs.

Summary:

Results from this project represent a first look at prescription drug utilization patterns of Medicare beneficiaries diagnosed with diabetes who enrolled in PDP plans in 2006. Although the generalizability of individual findings beyond our sample frame is limited, we detected certain consistent patterns in medication adherence that may well extend to the larger beneficiary population with diabetes. These patterns include the following: (1) low overall utilization rates for commonly recommended medications, (2) a strong negative association between illness burden and medication adherence, (3) lower drug prevalence rates among LIS enrollees, and (4) significant disparities in medication adherence between whites, blacks, and Hispanics.

Introduction

Background:

Approximately a quarter of all Medicare beneficiaries suffer from diabetes mellitus (Stuart, et al., 2007). Diabetes is a complex chronic disease resulting from insulin deficiency or failure of insulin action to control blood glucose levels. The disease can lead to loss of vision, heart problems, vascular and peripheral nerve dysfunction, kidney disease, and death. Traditional treatment guidelines stress education and patient self-management, tight control of hyperglycemia, and close physician monitoring and evaluation to prevent complications of the disease (American Diabetes Association, 2008). For elderly and frail persons with diabetes, newer guidelines place less emphasis on glycemic control in favor of control of cardiovascular risk factors (Brown et al., 2003).

Treatment recommendations for diabetes differ for Type I (complete pancreatic insulin deficiency) and Type II (resistance to insulin action) disease. Type I diabetes requires insulin. Treatment for Type II diabetes emphasizes control of blood glucose levels through diet, exercise, and oral hypoglycemic agents. Persons who require drug therapy for Type II diabetes are generally started on a single oral agent (typically metformin or a sulfonylurea) with the addition of other oral antidiabetic medications if adequate glycemic control is not maintained. The use of insulin alone or in combination with oral medications may be warranted for Type II diabetes as a last resort. Diabetes treatment guidelines also place emphasis on medications (renin-angiotensin-aldosterone system inhibitors or RAASIs) that may be necessary to control hypertension and help prevent kidney disease as well drugs to reduce high cholesterol levels (antihyperlipidemics or AHLs). Adults with diabetes are strongly recommended to have an annual flu shot and a pneumococcal vaccination every five years.

Recent studies suggest that better medication management for older individuals with diabetes not only improves health and reduces mortality, but also may be cost saving to the Medicare program (Hepke, et al., 2004; Sokol, et al., 2005; Gilmer et al., 2005). A decision analysis by Rosen et al. (2005) concluded that Medicare could save money if ACE-inhibitors were offered free to beneficiaries with diabetes. This provocative result raises the possibility that high levels of adherence with other medications widely used in diabetes treatment including ARBs, oral and injected antidiabetic medications, and lipid lowering agents may also produce Medicare cost savings.

There is wealth of clinical trial data showing that individual drugs in each of these classes can significantly reduce the risk of diabetes complications and thereby theoretically reduce future medical care costs. This literature provides the evidence base for current diabetes treatment guidelines (American Diabetes Association, 2008; Brown, et al., 2003). However, the impact of medications observed in the protocol-driven environment of a clinical trial does not necessarily translate to real world settings where risks factors may not be recognized, clinical guidelines not followed, and therapy inadequately monitored. Well-controlled observational studies are therefore necessary to assess medication adherence with drugs use in diabetes treatment so that future research can ascertain treatment effectiveness (and cost effectiveness) in everyday practice.

Study Objectives:

The study had three aims: (1) to describe the characteristics of Medicare beneficiaries with diabetes enrolled in PDP plans during 2006, (2) to characterize patterns in adherence to medications typically recommended for older individuals with diabetes including antidiabetic drugs, RAASIs, and AHLDs, and (3) to identify factors associated with differential adherence rates with these medications with a particular emphasis on comorbid COPD and major depression, enrollment in the Part D low-income subsidy (LIS), and overall illness burden captured by quintile of cumulative Medicare spending. The study builds upon prior analyses conducted by McBean, et al. (2008) of the characteristics, cost of treatment, and mortality among Medicare beneficiaries with diabetes and selected comorbidities.

Methods

Data Sources:

The data source for this study included Medicare claims and enrollment information obtained from the Chronic Condition Warehouse (CCW) prepared by the Buccaneer Corporation for CMS. Specifically, we used the enhanced 5% Part A and B claims files for inpatient, outpatient, carrier, home health agency (HHA), skilled nursing facility (SNF), durable medical equipment (DME), and hospice, together with the Part D denominator file, and selected variables from the prescription drug event (PDE) files for 2006.

Criteria for Selecting the Study Sample and Subsamples:

The data sample we received from CMS was restricted to active Medicare beneficiaries in 2006 with diabetes identified using a standardized algorithm developed by CCW that specifies a diagnosis of diabetes (ICD-9 codes of 250.00 to 250.93, 357.2, 362.01, 362.02, and 366.41 in any position on the claim) on at least one inpatient, SNF or HHA claim, or two outpatient or carrier claims at least one day apart during a 2-year “look-back” period. The “look-back” period for our sample was 2004 and 2005. Thus, all individuals in our sample had been Medicare beneficiaries since at least January 1, 2004. The CCW algorithm is described more fully in the CCW Manual <http://ccwdata.org/downloads/CCW%20User%20Manual.pdf> (link active as of 8/21/2009). The full CCW sample comprised 510,697 individuals.

In order to meet our study objectives, we required that all study subjects meet the following inclusion criteria: (1) survived through December 31, 2006, (2) were continuously covered for Part A and Part B throughout the year, (3) were continuously enrolled in a stand-alone Part D prescription drug plan (PDP) throughout the year, (4) had a unique beneficiary ID, and (5) had complete days supply of all PDE records for drugs included in the analysis. The rationale for requiring full year survival and PDP enrollment was to ensure comparable 365-day observation periods for calculating the drug utilization measures described below. The PDP enrollment criterion eliminated beneficiaries with either no Part D coverage or who enrolled in Medicare Advantage prescription drug plans (MA-PDs). We required continuous Part A and B coverage in order to assure a complete accounting of Medicare costs for the year. These

inclusion requirements resulted in 359,237 beneficiaries being dropped from the study, leaving a final analysis sample of 151,460 individuals (see Table 1).

In addition to the main sample, we created subsamples for more detailed analyses. The first cut subdivided the sample into PDP enrollees who did or did not receive any Medicare Part D low-income subsidy (LIS) during 2006. The rationale for this subdivision was two-fold. First, most PDP enrollees with full-year LIS benefits in 2006 were Medicare dual eligibles who were auto-enrolled in Part D, and thus differed from those who had to proactively enroll in Part D. Second, LIS enrollees faced significantly lower rates of drug cost sharing which we reasoned could significantly affect their drug utilization patterns. The two main subsamples comprised 50,958 non-LIS enrollees, and 100,502 LIS enrollees.

A further subdivision classified beneficiaries as having comorbid COPD and/or major depression (henceforth, we use the term “depression” to mean “major depression”). This resulted in 4 comorbidity-related subsets: (1) diabetes with neither COPD nor depression (n=105,028), (2) diabetes and COPD but no depression (n=17,019), (3) diabetes and depression but no COPD (n=21,985), and (4) diabetes and both COPD and depression (n=7,428). The purpose of the comorbidity groupings was to test the hypothesis that added comorbidity would negatively affect drug adherence with diabetes-related medications. We used CCW chronic disease flags in the CCW Chronic Condition Summary Files for 2004 – 2006 to select the COPD and depression subgroups. The CCW criteria for COPD include an ICD-9 codes (any position) 491.0 to 491.9, 492.0, 492.8, 494.0, 494.1, and 496, on at least one inpatient, SNF, HHA, or two outpatient or carrier claims at least one day apart. The CCW criteria for major depression include ICD-9 codes (any position) 296.20 to 296.36, 298.0, 300.4, 309.1, and 311 on at least one inpatient, SNF, HHA, or two outpatient or carrier claims at least one day apart.

Definitions for Selected Drugs and Medication Adherence Measures:

We focused on three major drug groups commonly prescribed to Medicare beneficiaries with diabetes: (1) antidiabetic drugs (comprising oral agents and insulins), (2) rennin-angiotensin-aldosterone system inhibitors or RAASIs (this class includes ACE-inhibitors and angiotensin II receptor blockers or ARBs), and antihyperlipidemics (AHLDs), a class that includes statins and other lipid lowering medications such as bile acid sequestrants, fibrates, ezetimibe, and niacin. As noted in the Introduction, there is a substantial literature supporting the clinical benefits from use of these medications among older adults with diabetes.

Specific drugs within each class were identified using NDC codes provided in the PDE files. We used three measures to assess drug utilization patterns for the full sample and the various subsamples defined by LIS status and concurrent disease: (1) any use, (2) duration of therapy (DOT), and (3) medication possession ratio (MPR). We computed these measures at both the individual drug level (e.g., metformin) and the class level (antidiabetic agents). The first measure of any evidence of drug use is typically not assessed in the drug adherence literature (Kenna, et al., 2005). However, the fact of nonuse—particularly at the broader class level—may be the strongest indicator of suboptimal medication behavior of all three measures. For example, while it is undoubtedly true that glucose levels of some Medicare beneficiaries with diabetes who filled no antidiabetic prescription in 2006 were well controlled with exercise

and diet (albeit unobserved), it also is likely that other nonusers of these drugs either failed to fill their first prescription, stopped taking the drug before the beginning of our observation period, or should have been prescribed—and filled—the drug, but were not. Nonuse for any of these reasons would be potentially problematic.

Our second measure of drug use is duration of therapy (DOT), defined as the number of days between the first and last fills in the year plus days of therapy supplied on the last fill or December 31, 2006, whichever occurred sooner. This measure systematically understates true duration of therapy because of unobserved left-censoring (i.e., beneficiaries with drug supply remaining from a prescription filled in 2005 are not credited with drugs carried over into 2006). If we assume this error is randomly distributed, then measured differences in duration of therapy across study subjects are not biased. However, we cannot test that assumption with a single year of data.

Our final drug utilization measure is the medication possession ratio (MPR) defined as total days of available therapy observed during the year divided by DOT. This traditional measure of drug adherence is less likely to be biased by left censoring, because both the numerator and denominator are calculated based on observed prescription fills. In some cases, beneficiaries had MPR values greater than 1.0. The most common explanation for this phenomenon is early refills. Rather than credit individuals with extra days supply of therapy, we capped all MPR values at 1.0. Our definition of MPR is essentially a measure of gaps in days supply (e.g., late refills) during the observed period of therapy. Some analysts include missing days supply at the end of the observation period in the denominator of the MPR (Vinc, et al., 2009). We capture these days in our DOT measure.

Other Measures:

For the multivariate analyses of drug adherence described in the next section, we included a number of covariates listed in Table 2. The selection of covariates was driven by data availability (and lack thereof) and hypothesized relationship to adherence. We included limited demographic factors (age, sex, race/ethnicity, and region of residence) from the Part D Denominator file. From the Part A and B claims files we developed measures of diabetes type (type I = 250.01; type II = 250.02), diabetes complications (250.1 – 250.9), chronic kidney disease (585.xx), counts of hierarchical chronic conditions (HCCs), and counts of prescription drug hierarchical chronic conditions (RxHCCs). We included selected Part A and Part B utilization measures including counts of physician visits, hospital days, and three common diagnostic tests recommended for diabetics (annual eye exam, HbA1C test, and cholesterol tests). Finally, from the First DataBank (FDB) drug dictionary, we developed a count of unique maintenance (chronic care) medication classes and drugs within these classes. The maintenance drug indicator in FDB uses product labeling to identify medications typically used when the duration of therapy is expected to exceed one year.

Statistical Methods:

Our analyses used univariate, bivariate, and multivariate models. All analyses were conducted using SAS version 9. We used univariate analysis to show the impact of study

inclusion, exclusion, and subsample selection criteria on sample proportions (Table 1). Bivariate cross-tabulations compared differences among the LIS and concomitant disease samples by subject characteristics (Tables 2.1 to Table 2.3), drug prevalence (Tables 3.1 to Table 3.3.4), duration of therapy (Tables 4.1 to Table 4.3.4), and MPR (Table 5.1 to Table 5.3.4). For the multivariate models, we used a logit model to estimate correlates of use of the three broad drug classes (any oral antidiabetic drugs, RAASIs, and antihyperlipidemics) (Table 6), and ordinary least squares (OLS) to estimate correlates of DOT (Table 7) and MPR (Table 8).

Assessment of Contextual Generalizability:

Because our analysis reviewed statistics for a subset of Part D enrollees (PDP enrollees only) during the inaugural year for Part D (during which beneficiaries could enroll penalty-free up to May) there is the possibility that the findings have limited generalizability. We addressed this issue in two ways. First, we conducted an analysis of beneficiaries' drug coverage status to see how our sample (full-year PDP enrollment) compared in size to other sources of drug coverage available to beneficiaries in 2006. Using the Part D Denominator File it is possible to classify beneficiaries according to Part D plan enrollment (PDP versus MA-PD) by month. The file also identifies beneficiaries in employer-sponsored plans eligible for retiree drug subsidies (RDS) and persons with one or more of five types of creditable coverage judged by CMS to be at least as generous actuarially as the standard Part D benefit. The five types include the Federal Employees Health Benefits Plan (FEHBP), Tricare, the Veterans Administration (VA), state pharmaceutical assistance plans (SPAPs), and Medicare beneficiaries who are working for an organization that provides health insurance.

Secondly, we compared annual prevalence rates for users of each drug class for beneficiaries included in the study sample to PDP enrollees who entered the program after January 1, 2006, as well as to full-year and part-year MA-PD enrollees in 2006. The within-sample comparisons contrasted drug prevalence in the first and last quarters of 2006. We expected that prevalence of drug use would likely be somewhat lower in the first quarter of the year due to carry-over of prescribed drugs from 2005; however, we also reasoned that transition issues in enrollment and bill processing could contribute to lower rates in the first quarter. The second contrast was for Medicare beneficiaries who enrolled in a PDP after January 1, 2006. Here we reasoned that drug prevalence rates would likely be lower than for full-year PDP enrollees both due to the high LIS enrollment rate in the study sample, and to the fact that beneficiaries with fewer chronic conditions and lesser need for Part D coverage would be more likely to delay part D enrollment. Our final contrast to full-year and part-year MA-PD enrollees was designed to permit comparisons in drug prevalence rates between the PDP and MA-PDP populations. However, caution is urged in interpreting these results as the identification of MA-PD enrollees with diabetes required claims-based evidence of the disease during the CCW "look-back" period (2004 – 2005). In other words, only beneficiaries who transitioned from fee-for-service to Medicare Advantage plans over this period are included.

Results

Characteristics of the Study Sample and Subsamples:

Table 1 shows how the study inclusion and exclusion criteria affected the size of the main analytical sample and subsamples with and without LIS and comorbid COPD and/or depression. Our CCW 5% sample included 510,697 Medicare beneficiaries in 2006 diagnosed with diabetes in 2004 or 2005. The impact of each exclusion criterion is shown in the top half of Table 1. The most important exclusions were not covered for Part D full year (334,266) and not enrolled in a PDP full year (352,585), two measures with a high degree of overlap. Deaths accounted for a 6.6% reduction in sample size. Not having either Part A (16,304) or Part B (17,557) reduced the data set by a cumulative 0.6%. Very small numbers of beneficiaries were excluded because they had duplicate IDs or incomplete days of therapy supplied on their PDE records for the drugs of interest to the study. The final analytic sample comprised 151,460 beneficiaries

The bottom panel of Table 1 shows the break-downs by LIS status and comorbidity. Overall, two-thirds of the sample had LIS, 16.1% had comorbid COPD, and 19.4% had comorbid depression. The rates of comorbidity with these two conditions were markedly higher in the LIS subsample.

Descriptive characteristics of the study beneficiaries are presented in Table 2.1 for the full study sample and concurrent disease subsamples (diabetes and no COPD or depression, diabetes plus COPD, diabetes plus depression, and diabetes plus COPD and depression). Tables 2.2 and 2.3 present identical information for beneficiaries without LIS and with LIS, respectively. The first panel of variables in each table shows numbers and proportions of beneficiaries with Part A or B claims identifying diabetes type, complications, and comorbid chronic kidney disease (CKD). Of particular note is the fact that type of diabetes could not be determined from claims for over half of the sample (52.5%). We believe this is due largely to an artifact of ICD-9 coding in which diabetes type is coded at the 5th digit (250.01 and 250.02), and 5th digit codes are frequently absent from claims even when the underlying conditions are present. By contrast, diabetes complications are 4th digit codes (250.1 to 250.9) and are listed for 39.1% of the full sample, ranging from a low of 36.9% to beneficiaries without comorbid COPD or depression to a high of 48.9% for beneficiaries with both conditions (Table 2.1). CKD is a relatively rare additional complication of diabetes (13.8% for the full sample) but is positively associated with comorbid COPD and depression (21.3%). Comparing diabetes complications rates for the non-LIS and LIS subsamples (Tables 2.2 and 2.3) indicate that the latter are much more likely to suffer diabetes complications: 33.2% versus 42.2%, respectively. As in the full sample, rates of diabetes complications are higher among those with comorbid COPD and/or depression.

The next four panels of Tables 2.1 to 2.3 present demographic characteristics. As noted in the methods section, our lowest age range is <67, reflecting the fact that the only beneficiaries aged 65 and 66 in our sample are former SSDI, and it makes more sense to combine them with the <65 true SSDI enrollees. That said, fewer than 5% of the total <67 beneficiaries shown in these tables were 65 or 66 years old. The proportions of the full study sample under age 67 was 26.9%, but differed significantly among those with and without LIS—35.3% and 10.5%,

respectively. At the other end of the age scale, 26.3% of beneficiaries were aged 80 or older, ranging from 24.5% (LIS) to 29.8% (non-LIS). There was a substantial racial difference in make-up of the subsamples, with 91.7% of non-LIS beneficiaries being white (5.9% black) compared to just 62.3% of LIS enrollees (23.3% black). There were relatively small differences in gender and census region across the subsamples.

The remaining variables in Tables 2.1 to 2.3 capture differences in various aspects of health care utilization across the sample categories. As one would expect, utilization rates are generally higher for beneficiaries with comorbid disease. For example, while 33.6% of beneficiaries without comorbid COPD or depression in the full sample (Table 2.1) recorded more than 15 physician visits, 84.1% of those with both comorbidities did so. Similar patterns are seen for RxHCC and HCC counts, hospital days, and number of maintenance drugs and drug classes. However, the opposite result is seen with respect to routine testing. Prevalence rates for eye exams, HbA1C test, and cholesterol tests are all consistently lower among beneficiaries with comorbid disease compared to those without (Table 2.1). These patterns are found in both the subsample without and with LIS coverage (Tables 2.2 and 2.3). Beneficiaries with LIS exhibit much higher rates of physician visits and hospital care, and have correspondingly higher RxHCC and HCC counts compared to those without LIS. They also have higher usage of maintenance medications. However, LIS enrollees have much lower rates of routine testing compared to non-LIS enrollees: 43.3% versus 55.6% for eye exams, 54.1% versus 60.2% for HbA1C tests, and 47.4% versus 56.4% for cholesterol tests, respectively.

Descriptive Findings on Drug Utilization:

Prevalence of Drug Use:

Tables 3.1 through 3.3.4 provide details on prevalence rates for each drug class and major drug types within these classes. The granularity of these 12 tables makes it impossible to discuss findings in detail, so we limit the presentation to highlights. The layout of the tables reflects up to three levels of aggregation. The highest level of aggregation (in bold type) reflects the broad classes of antidiabetics, RAASIs, and AHLDs. Antidiabetic users are then separated into two groups according to whether they used a single medication in the class in 2006 or were users of two or more antidiabetic medications during the year. This distinction captures both individuals who were switched from one to another antidiabetic or were prescribed multiple antidiabetics concurrently. At the final level of aggregation are the individual medications (e.g., sulfonylureas, metformin, insulin, etc.) and specific combinations (sulfonylureas plus metformin). The RAASI medications comprise just two drug types—ACE-inhibitors and ARBs—which are rarely prescribed together. In this instance, users of both agents in 2006 probably reflect drug switching. The final class of AHLDs also includes two subclasses, statins and a catch-all group of other lipid lowering agents.

A second distinguishing factor of these tables is the two-fold classification of disease burden. Each table presents drug prevalence for the identified sample or subsample with a break-down by quintile of cumulative Medicare spending over the year. Thus Table 3.1 presents data for the entire sample by spending quintile. Table 3.1.1 covers the subset without concomitant COPD or depression, etc.

Focusing on any antidiabetic use, we note that annual prevalence rates ranged between 55% and 74% depending upon subsample and quintile ranking. For the quintile rankings, the lowest prevalence tended to be recorded in the bottom quintile, rising a few percentage points in the middle quintiles, and then falling back somewhat in the upper quintiles. This inverted “U” pattern is evident over the entire sample (Table 3.1) with use of any antidiabetic agent at 69.5% in quintile 1 (Q1), rising to 72.2% in Q3, and then dropping to 68.6% in the highest quintile, Q5. The pattern is more exaggerated in some subsamples than others. For example, among beneficiaries with LIS and concomitant COPD (Table 3.3.2), use of any antidiabetic agent was only 55.8% in Q1 rising to 70.3% in Q4, then falling back to 67.9% in Q5. Any use of antidiabetic agents also varied systematically by LIS status with and without comorbid disease. Overall, utilization of antidiabetics was consistently higher among LIS enrollees (71.6%; Table 3.3) compared to non-enrollees (68.9%; Table 3.2), but lower among beneficiaries with concomitant disease.

The composition of antidiabetic drug use also varied by quintile, concomitant disease, and LIS status. Not surprisingly, use of insulin was strongly associated with higher disease burden. Overall, just 12.3% of beneficiaries in the lowest Medicare spending quintile (Q1) used insulin alone or in combination with an oral antidiabetic agent compared to 37.9% for those in Q5 (Table 3.1). For the LIS sample, the corresponding rates of insulin use were 27.6% in Q1 and 40.8% in Q5 (Table 3.3.). Use of oral antidiabetic agents was dominated by the older medications (metformin and the sulfonylureas) across all sample segments. Use of the newer oral antidiabetic agents represented by the thiazolidinediones (TZDs) was rarely prescribed as a single agent, but more commonly in combination with metformin and the sulfonylureas. There is little apparent difference in rates of TZD use by LIS status, but noticeably higher rates of use among beneficiaries in the lower Medicare spending quintiles compared to those in the higher quintiles.

Use of RAASIs varied between 62% and 66% over the entire sample (Table 3.1). Overall, ACE-inhibitor use was approximately twice that of ARBs. The inverted “U” shape pattern seen in antidiabetic use is evident among the RAASIs, but quintile differentials are less dramatic, and in several subsamples with concomitant COPD or depression, the highest prevalence was recorded among beneficiaries in the highest Medicare spending quintile (e.g., Table 3.2.3 and Table 3.3.4). Comorbid depression was consistently associated with lower rates of RAASI use than comorbid COPD. RAASI use did not vary appreciably between LIS and non-LIS enrollees.

Utilization of AHLDs ranged between 57% and 64% of the sample with the vast majority of beneficiaries using statins as opposed to other lipid lowering drugs. For the sample as a whole (Table 3.1) 55.4% used statins compared to only 4.9% for other drugs in this class. Utilization rates for AHLDs showed greater variance by illness burden than for either the antidiabetic agents or RAASIs. An inverted “U” pattern is evident across the subsamples with the highest utilization rates consistently found in the middle quintiles. As with RAASIs, utilization of AHLDs was much lower among those with comorbid depression; however, comorbid COPD had little effect on utilization of AHLDs. LIS enrollees were also less likely to use an AHLD (58.4%, Table 3.3) compared to the non-LIS enrolled (64.2%, Table 3.2)

Duration of Therapy (DOT):

The next set of tables—Tables 4.1 to 4.3.4—present information on DOT for users of the same drugs described in the previous section. The table lay-outs are also identical. In reviewing these statistics, readers are reminded of the fact that any carry-over of drugs from a 2005 prescription fill are not counted, and thus the reported days under-represent the true mean DOT for each drug class during 2006. There is no reason to believe, however, that the degree of under-reporting would vary by drug class. In other words, we believe that any relative differences in reported DOTs across the sample segments would be similar to those were we able to present complete DOT results with 2005 carry-over supplies added in.

For the sample as a whole, mean DOTs ranged from 294 days (antidiabetic agents), 284 days (RAASIs), and 275 days (AHLDs) (Table 4.1). In all but a few instances for specific drugs, the annual DOTs are highest for medication users in the second Medicare spending quintiles (Q2), and then uniformly decline for beneficiaries in the higher quintiles Q3 to Q5. The declines in mean DOT values between the Q2 and Q5 sample segments are quite large, averaging between 20 and 30 days shorter duration of therapy for those in the top 20 percent of Medicare spenders. These patterns persist across the subsamples with and without LIS and with and without comorbid COPD and/or depression. The subsamples with and without LIS (Tables 4.3 and 4.2, respectively) had very similar DOT values for all of the drug groups as well as for specific medications within these groups. However, the presence of comorbid COPD or depression was uniformly associated with lower DOT values across the board. For example, beneficiaries with diabetes and neither COPD nor depression had a mean DOT with oral antidiabetic therapy of 298 days (Table 4.1.1), whereas those with diabetes and COPD averaged 284 days for the same drug group (Table 4.1.2). Adding depression to the illness burden lowered the mean DOT further to 273 days (Table 4.1.4). The negative relationship between DOT values and Medicare spending quintile segment for beneficiaries with comorbid COPD and depression is truly dramatic, with differences averaging about 50 days shorter DOTs for beneficiaries in Q5 versus Q2 (Table 4.1.4).

Medication Possession Ratios (MPR):

As shown in Figures 1 to 3, the distribution of MPR values was highly right-skewed for all beneficiaries using oral antidiabetics, RAASIs, and AHLDs. Similar distributions (not shown) were found for drugs within these larger classes for all sample segments. Mean MPR values for the various sample segments are reported in Tables 5.1 to 5.3.4. The MPRs were uniformly high—0.82 or higher in all subsamples including those with concomitant COPD and depression (Tables 5.1.4, 5.2.4, and 5.3.4). The MPRs for those without concomitant COPD or depression averaged 0.88 or higher. One simple explanation for these findings is that we compute both DOT and MPR over a single year (2006). Were we able to compute MPRs over two years or longer, some of the variation in DOT values described in the previous section would translate into lower, longer-term MPRs. Given our methodology, any end-of-year gaps in therapy are captured in the DOT rather than the MPR measures. Thus, were MPR measured over two years, we would expect these gaps to be reflected in lower MPRs.

Multivariate Findings:

Tables 6 through 8 present regression results predicting medication adherence rates for the full sample. Table 6 presents odds ratios for any use of oral antidiabetic drugs (column 2), RAASIs (column 3), and AHLDs (column 4). The results confirm most, but not all of the bivariate relationships between drug prevalence, LIS enrollment, and disease burden. For each of the three drug classes, LIS enrollment (compared on non-LIS enrollees) was associated with significantly lower conditional odds of use ranging from 0.69 ($p < .001$) for AHLDs to 0.83 ($p < .001$) for oral antidiabetic agents (in the bivariate statistics LIS enrollees had higher use of oral antidiabetic agents compared to non-LIS enrollees). Comorbid COPD and depression were both associated with lower conditional odds of drug use. The strongest effects are observed for comorbid depression which lowers the odd of any use to 0.62 ($p < .001$) for AHLDs, 0.64 ($p < .001$) for RAASIs, and 0.81 ($p < .001$) for oral antidiabetic agents. The conditional odds associated with COPD range from 0.67 ($p < .001$) for AHLDs to 0.85 ($p < .001$) for oral antidiabetic drugs. Increasing illness burden reflected by Medicare spending quintile is independently associated with declining odds of medication use. With Q1 as the reference, the odds of any use of oral antidiabetic drugs fall monotonically from 0.92 ($p < .001$) in Q2 to 0.63 ($p < .001$) in Q5. Similar rates of decline are seen for RAASIs and AHLDs. It is important to note that these findings are conditional on other measures of illness burden and disease severity included as covariates in the three models. These other variables include a count of RxHCCs, diabetes type, and diabetes complications. Of these variables, only diabetes complications were associated with increasing odds of medication use in the three drug classes. The lower odds for oral antidiabetic agents would be expected in the case of Type I diabetes and comorbid kidney disease, but it is surprising that having Type I or Type I and II diabetes would be associated with lower use of RAASIs and AHLDs. Taken together, these findings make a strong case that higher disease burden significantly reduces the likelihood that Medicare beneficiaries with diabetes get any medications in drug classes typically recommended for control of the disease and its sequelae.

Other important predictors of drug prevalence drawn from the three regression models in Table 6 deserve mention. The positive association between drug prevalence and count of maintenance drugs is partly artificial because use of medications in each of the three drug classes of interest would add to this count. Increasing age had an independent effect in reducing odds of drug use, particularly for those beneficiaries aged 80 and older. There were mixed effects associated with race and ethnicity. Compared to whites with diabetes, blacks had significantly lower odds of using any oral antidiabetic agents ($OR=0.86$, $p < .001$) and any AHLD ($OR=0.75$, $p < .001$). But blacks had conditionally higher odds of using RAASIs ($OR=1.35$, $p < .001$). Hispanics had significantly higher odds of use of oral antidiabetic agents and RAASIs compared to whites ($p < .001$ in each case). Somewhat surprisingly, increasing contacts with physicians was associated with lower not higher odds of using each class of medications. It would appear that while more physician visits raise the opportunity for new prescriptions, they also reflected higher morbidity which—as seen with the other illness-related variables—consistently predicted lower odds of use for the three medication classes. The odds ratios for eye exams, HbA1C tests, and cholesterol tests were mostly positive, suggesting perhaps a

common link between the propensity to get recommended tests and recommended drug therapies.

Table 7 presents regression findings for predictors of duration of therapy (DOT) restricted to users of each medication class. The coefficients are read in days; thus, the positive coefficient of 4.8 ($p < .001$) on the LIS variable in the oral antidiabetic drug regression can be interpreted to mean that having LIS benefits was associated with 4.8 days longer annual DOT compared to beneficiaries not enrolled in LIS (other things being equal). LIS was shown to have a similar, small positive association with DOT for RAASIs and a somewhat larger impact on DOT for AHLDs. As with prevalence of drug use, comorbid COPD and depression both negatively impact DOT for users of all three drug classes with effects ranging from -3 days for RAASI users with depression to -8 days for oral antidiabetic drug users with COPD (all with p values $< .001$). Likewise, increased Medicare spending (via quintile assignment) has a consistent negative impact on DOTs for all drug classes with effect sizes up to -20 days (RAASI users in Q5 versus Q1). Diabetes type and complication rates had mixed effects on DOT values. The impact of physician visits on DOTs was negative and significant, but only for beneficiaries with 15+ visits.

Some of the largest effect sizes in the DOT regressions are associated with race and ethnicity. Blacks had significantly lower DOTs within each drug class compared to whites, ranging from -3 days ($p < .001$) for RAASI users up to -17 days ($p < .001$) for AHLD users. The effects were even larger for Hispanics compared to whites, with the difference in DOT values ranging from -12 days ($p < .001$) for users of older antidiabetic agents to -23 days for AHLD users.

Table 8 reports findings from the medication possession ratio (MPR) regressions. Because MPR was constrained to values between 0 and 1, a one unit change is equivalent to moving from being a nonuser to being 100% compliant. By mentally moving the decimal point two places to the right, one can read the coefficients as the effect size in percentage terms. As an example, users of older antidiabetic agents with Type I diabetes (coefficient = 0.0138***) have MPRs 1.4% above users with Type II diabetes (the reference category). In these models, LIS enrollment had no significant impact on medication adherence for older oral agents or RAASIs, and a very small positive impact on MPR for AHLDs (0.96% higher than non LIS enrollees). Likewise concomitant COPD and depression had little impact on MPR values. However, quintile of Medicare spending continued to have a significant, albeit small negative effect on medication adherence, with MPRs for persons in Q5 being 1.4% to 2.3% lower compared to beneficiaries in Q1. Increasing age was associated with small incremental reductions in MPR. Higher physician visits were associated with fractionally lower MPRs. As in the DOT regressions, race and ethnicity had the biggest impact on MPR. Being black reduced MPRs for all drug classes with effects sizes in a narrow range between -3.7% to -3.9% ($p < .001$). The MPRs for Hispanics were between -3.2% to -4.4% ($p < .001$) compared to whites.

Putting the Study Findings in Context:

Before discussing the implications of these findings to Medicare, it will be helpful to place the study in the context of the program (Part D), the times (2006), and the limitations of

Federal data gathering. Briefly, Medicare Part D is a voluntary program requiring proactive enrollment by eligible beneficiaries (except for Medicare dual eligibles who are auto-enrolled). The program provides an inducement for enrollment at a beneficiary's first opportunity by imposing a 1% premium "tax" per month on otherwise-eligible beneficiaries who fail to enroll. The term "eligible" in this context means that the beneficiary does not have creditable (i.e., actuarially equivalent) coverage from an employer (RDS) or other approved organization. Beneficiaries could enroll penalty-free up to May of 2006 (thereafter, the enrollment period ends in December of the preceding year). This quirk in the enrollment period in 2006 meant that a large number of beneficiaries had only part-year coverage that year. CMS gathers data on enrollment in PDPs, MA-PD plans, RDS plans, and other creditable plans. However, drug data are only available for PDP and MA-PD plans, so it is impossible with CCW data to compare drug utilization in Part D versus RDS or other creditable plans.

Table 9 presents statistics on the status of known drug coverage of all beneficiaries in the 2006 CCW 5% sample of beneficiaries with diabetes who met our study exclusion criteria except for the Part D and PDP enrollment criteria (N=453,584). Based on CCW Denominator File data, 51.8% of this group enrolled in PDPs, of whom 64.4% had full-year enrollment and 35.6% had part-year enrollment. Only 4.7% of the group enrolled in MA-PD plans (58.9% full-year and 41.1% part-year). This low number is an artifact of the way that CCW defines disease samples based on claims data during a specified "look-back" period. Beneficiaries must have had sufficient fee-for-service coverage during 2004 and 2005 to identify a diabetes diagnosis; thus anyone with the disease who was continuously enrolled in an MA plan was not picked up. The other major sources of drug coverage in 2006 were enrollment in an RDS or other creditable coverage plan. The statistic for creditable coverage shown in Table 9 includes all persons with creditable coverage even if they were also enrolled in another plan type. For example, 16,535 full-year PDP enrollees also had some form of creditable coverage in 2006 (results not shown). Only 13.1% of the entire group had no known creditable drug coverage in 2006.

These statistics have important implications for interpreting the study results. To summarize: (1) our study sample of 151,460 represents just 33.4% of beneficiaries in the CCW 5% sample with diabetes who met our full-year coverage requirement, (2) the full-year PDP enrollees represent just 64.4% of all PDP enrollees in 2006 (the remainder enrolled after January 1, 2006), and (3) some PDP enrollees had other creditable coverage during 2006 and may have filled prescriptions through those other plans.

Although we could not compare drug adherence rates between Part D and other creditable drug plans using CCW data, we were able to make comparisons within the Part D plan types. Table set 10 presents the results of these analyses for the sample as a whole (Table 10.1) and by comorbid COPD and depression (Tables 10.1.1 to 10.1.4). As described in the methods section, we used drug prevalence as our "test measure" for generalizing beyond the study sample frame. First, we conducted a within-sample comparison of drug prevalence rates for the first and last quarters of 2006 (columns 3 and 4 in each table). We hypothesized that a finding of lower user rates in the beginning of the year might be a consequence of start-up problems encountered by Part D plans early in 2006. And indeed, the first quarter prevalence rates are uniformly lower. For example, only 59.6% of the sample had evidence of using any antidiabetic drug in the first quarter compared to 64.3% in the fourth quarter. Similar differentials are evident in the RAASI

and AHLDD drug classes. If these differences were due to program start-up problems, then our reported drug utilization measures may understate adherence rates for PDP enrollees in future years. But it is also possible that some or all of the first-to-fourth quarter differentials are due to carry-over of drugs from prior year prescriptions.

Our second comparison was between full-year PDP enrollees (column 2 in each table) and part-year enrollees (column 5). The hypothesis in this case was that late enrollees might be healthier and thus have lower medication utilization rate compared to those who qualified for benefits beginning January 1. Here too, we find results consistent with the hypothesis. For example, only 62.7% of late PDP enrollees were users of antidiabetic drugs compared to 70.7% for full year PDP enrollees (Table 10.1). Even larger differences are seen in the use of AHLDDs. Although some of these differences may be due to the shorter observation period for part-year enrollees, we also know that most late enrollees were not dual eligibles or LIS enrollees. Comparisons of medication adherence between LIS and non-LIS enrollees in the main study sample (Table set 3) suggest that this could be the primary reason for the observed differences in Table 10.

Our third comparison was between full-year and part-year PDP enrollees (columns 2 and 5) and full-year and part-year MA-PD enrollees (columns 6 and 7). These comparisons are subject to the major caveat identified above regarding the composition of MA-PD enrollees in the CCW 5% diabetes file. We found very few MA-PD enrollees in the CCW file with comorbid COPD (Table 10.1.2 and Table 10.1.4) and/or depression (Table 10.1.3 and Table 10.1.4), suggesting that healthier diabetics were more likely than sicker diabetics to have switched into MA-PD plans after 2004. This finding implies that the most appropriate PDP versus MA-PD comparisons are for diabetics with neither comorbid COPD nor depression. These results are shown in Table 10.1.1. Here we see marked differences in drug prevalence rates suggesting potentially different prescribing practices in fee-for-service and MA plans. Among full-year enrollees, 78.7% of those in MA-PD plans were users of antidiabetic drugs compared to 72.1% in PDPs. The differences for part-year enrollees are comparable. It is also interesting to note that the differential comprises a combination of higher insulin use in MA-PD plans (25.9% versus 21.8% counting sole use and combinations with oral agents), higher utilization of the older, less expensive oral antidiabetic agents, metformin and the sulfonylureas (34.6% compared to 29.4%) with a somewhat lower utilization of newer, high priced oral antidiabetic agents including TZDs, alpha-glucosidase inhibitors, and others (18.2% versus 20.2%). Utilization of RAASIs was also marginally higher for full-year MA-PD enrollees compared to PDP enrollees (68.9% versus 66.2%) with the difference due to higher prevalence of the older, cheaper ACE-inhibitors (46.1% versus 41.1%) and lower prevalence of the high priced ARBs (16.2% versus 19.2%). Prevalence of statin use was comparable across the two types of plans.

It should be emphasized that all three of these contextual comparisons are based on descriptive cross-tabulations without controlling for beneficiary self-selection effects or other potential confounders. Future research using longitudinal CCW data with additional years of PDE records should help clarify issues regarding data validity early in 2006 and compositional differences between populations of early and later Part D entrants. The third issue regarding comparisons of drug utilization between stand-alone PDPs and MA-PD plans will remain highly problematic given the lack of Part A and Part B data for MA-PD enrollees. Without medical

claims or comparable encounter data with diagnostic codes, it is nearly impossible to construct representative disease-based samples or to control for confounding due to comorbidity.

Discussion

Implication of Study Findings for Medicare:

Although we recognize that the generalizability of individual findings beyond the study sample frame is limited, we detected certain consistent patterns in medication adherence that may well extend to the larger beneficiary population with diabetes. These patterns include the following: (1) low overall utilization rates for commonly recommended medications, (2) a strong negative association between illness burden and medication adherence, (3) lower drug prevalence rates among LIS enrollees, and (4) significant disparities in medication adherence between whites, blacks, and Hispanics.

Given that the mainstay for glycemic control of diabetes is through oral antidiabetic agents and insulin, it was surprising to discover that just 71% of our sample had any evidence of antidiabetic medication over the entire year. It is probable that some beneficiaries were able to control their disease through exercise and diet, but these efforts are typically insufficient once the disease has become established (all beneficiaries in our sample had been diagnosed with diabetes at least a year prior to our assessment). Overall utilization rates are also low (64.7%) for ACE-inhibitors and ARBs (RAASIs) which are routinely recommended in diabetes guidelines as a means of helping prevent kidney disease. The proportion of beneficiaries taking statins or other AHLDs (60.3%) is difficult to judge without evidence of hyperlipidemia, but the fact just over half (50.4%) of all beneficiaries even had their cholesterol checked during the year opens up the possibility of underuse.

We found that however drug adherence was measured—any use, duration of therapy, or medication possession ratio—beneficiaries with greater disease burden consistently scored lower for each drug category. This relationship was evident in descriptive cross-tabulations of adherence by specific comorbidities (COPD and major depression), counts of medication-sensitive conditions, and quintile of cumulative Medicare spending over the year. It even showed up in counts of physician visits, which we anticipated would be positively correlated with adherence, but turned out to have the opposite sign. Moreover, all of these associations were strongly statistically significant in our regression models.

The fact that two-thirds of the study population was enrolled in the Medicare Part D low income subsidy program provided a large sample to analyze the impact of LIS on drug utilization patterns. LIS enrollees faced much lower cost sharing than other Part D participants, so one might have expected to see better adherence rates in this group. We found mixed results in the descriptive cross-tabulations, which is not surprising given large differences in demographic characteristics and health status measures between the two groups. In the multivariate analysis, LIS enrollment was strongly associated with lower prevalence, but marginally higher DOTs for all drug groups in our study.

Finally, although we did not design the project to study potential racial and ethnic disparities in medication adherence among Medicare beneficiaries with diabetes, these variables are captured in Medicare enrollment records and we included them as covariates. We found that except for any RAASI use, blacks had consistently lower rates of medication adherence compared to whites on all of our measures. Durations of therapy (DOT) was between 10 and 17 days shorter for blacks and, within a given DOT, medication possession ratios (MPR) were between 3% and 4% lower than for whites. Hispanics were more likely than whites to be users of oral antidiabetic medications and RAASIs, but like blacks had substantially lower durations of therapy (12 to 23 days shorter DOTs) and consistently lower MPR measures (4% on average) compared to whites. These racial and ethnic disparities clearly deserve the attention of policy makers and future researchers.

Lessons for Researchers:

As with any analysis using a new database (CCW files with PDE records), we encountered various analytical challenges relating to the sample, measures, and generalizability of results. Some were expected, others were not. In this section, we summarize these issues and provide brief guidance to researchers based on our experience.

Our sample selection process used the CCW diabetes flag to identify beneficiaries within the Medicare 5% sample. The CCW criteria for diabetes diagnosis are straightforward and well supported; however, there is the possibility that using claims evidence alone will result in both false positives and false negatives. A recently published paper by Stuart et al. (2009) used annual data from the Medicare Current Beneficiary Survey (MCBS) to identify Medicare beneficiaries with diabetes using both the claims-based CCW diabetes criteria and a self-report of diabetes. They found 73.3% of their sample met both the claims-based and self-report criteria, 12.5% had a self-report only, and 14.3% only met the claims-based criteria. Among the subsample meeting both criteria, 70.1% reported using at least one antidiabetic agent during the year. The prevalence of antidiabetic use in the subsample with claims-based criteria alone was just 12.6%, suggesting, perhaps, that many if not most of these beneficiaries had a rule-out diagnosis of diabetes rather than a confirmation of the disease. This finding implies that some of the beneficiaries in our CCW sample actually did not have diabetes, and that their inclusion means that we have under-estimated actual rates of medication adherence for those who truly have the disease. Unfortunately, there is no independent way to test that hypothesis in annual CCW samples, because there is no information on self-reported disease. Two possible work-arounds would be to increase the number of claims required for diabetes ascertainment or to require a diabetes diagnosis in subsequent years. Each of these steps would decrease the number of false positives but at the cost of excluding a higher number of true positives. Moreover, any sample thus constructed would be tilted toward diabetics with more severe disease. A third approach would be to use drug as well as diagnostic indicators for disease ascertainment. This is commonly done in the case of diabetes because antidiabetic agents are very rarely used to treat other conditions. Yet like the other possible fixes, this entails a cost. It would be impossible with samples created in this way to assess prevalence of use of antidiabetic agents, and as we have shown, there is systematic variability in utilization of these drugs.

A second issue in using samples identified with the CCW flags is the “look-back” period. Because CCW uses a two-year “look-back” rule for diabetes, our sample was selected among beneficiaries diagnosed with diabetes in 2004 or 2005 who survived to 2006. This selection process introduces several subtle forms of bias. First, some individuals with diagnosed diabetes in 2004 and 2005 died before 2006 and are thus excluded from the sample (survivor bias). Second, all beneficiaries with a first diagnosis of diabetes in 2006 are excluded because they failed to meet the “look-back” criteria. Third, some of these excluded beneficiaries were new Medicare enrollees aged 65 or 66—the “look-back” rule means that our sample excludes all beneficiaries in this age bracket. In order to construct a sample that is fully representative of beneficiaries with a given disease in a given year, it must be based on diagnostic indicators in that same year. It is certainly possible to do that using CCW data, but not with the 21 chronic condition flags currently provided with the CCW files. There is also a trade-off in terms of mixing some incident cases in with the all-prevalent cases assured by the “look-back” rules.

Moving next to measurement issues, our greatest challenge was to operationalize measures of DOT and MPR. The PDE file contains the essential variables needed to create these variables—NDC number (from which we identified the drug), product fill dates, and days therapy supplied. The process was time-consuming because it required identifying all drugs within a given class at the individual level and then linking prescription start and end dates for all fills over the year. There was also the intellectual challenge of how to deal with persons using more than one product in a given class which could signify either drug switching or concurrent therapy. Both switching and concomitant therapy are common in diabetes treatment. We chose not to spend the additional resources necessary to distinguish the two phenomena, but it is certainly possible given dates of service and days supply on the PDE records. For our descriptive analysis, we chose to report drug prevalence, DOT, and MPR separately for users of the most common single and combination therapies. At the class level, we calculated DOT as the days between the first prescription in the year for any drug in the class and the last fill plus days supply (or December 31 if that occurred sooner) for any drug in that same class. The MPR for persons with multiple drugs within the same class was computed by adding days supply for all drugs in the class as the numerator, and then dividing by the sum of DOTs for each drug. Neither of these measures distinguishes between drug switching or adding/dropping therapies. Ours was a pragmatic decision based on limited resources rather than clinical judgment. Other researchers using CCW data may choose to use more refined measures.

At several points in this report we identify factors that limit the generalizability of the study results. By design, we limited the main study sample to diabetics enrolled in PDPs for all of 2006, and consequently make no claims of strict generalizability to other segments of the Medicare population. A more basic question is whether we can even generalize to the full-year PDP population? The issue is beneficiary self-selection and its impact on observed adherence rates. While most of the LIS enrollees in our sample were administratively transitioned from Medicaid drug coverage, everyone else made a conscious decision to enroll based on their own predilections and whatever information they had at hand. These predilections and information sources are unobserved by the researcher, but could have a major impact on study outcomes. For example, in our comparison of drug prevalence rates between PDP and MA-PD enrollees we identified far fewer MA enrollees with diabetes and comorbid COPD or depression compared to the PDP samples. This suggests that sicker diabetics eschewed managed care plans in favor of

PDPs. If that were indeed true, it means that our adherence results reflect some (unknown) combination of effects theoretically attributable to being in a PDP together with other effects associated with the unobserved characteristics of beneficiaries who select into them—in short, the results are biased. Put another way, if beneficiaries were randomized to PDPs and MA-PDs, we would expect to see different adherence rates than those reported in this study. Economists have developed various selection control models to address this type of bias (Imbens, G.W., Wooldridge, J.M., 2009). Researchers planning to use CCW data for future projects should give them serious consideration, particularly when causal inference is desired. In purely descriptive studies, selection is not an issue—the characteristics of selected samples are what they are.

Summary and Conclusions

Results from this project represent a first look at prescription drug utilization patterns of Medicare beneficiaries diagnosed with diabetes who enrolled in PDP plans in 2006. We found: (1) low overall utilization rates for commonly recommended medications, (2) a strong negative association between illness burden and medication adherence, (3) lower drug prevalence rates among LIS enrollees, and (4) significant disparities in medication adherence between whites, blacks, and Hispanics.

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Tables and Charts

Table 1. Study Exclusion and Inclusion Criteria with Sample Sizes

Table Set 2. Characteristics of Study Sample and Subsamples

- 2.1 Full study sample
- 2.2 Subsample 1 – study sample without LIS
- 2.3 Subsample 2 – study sample with LIS

Table Set 3. Prevalence of Use of Drugs by Quintile of Medicare Spending (15 tables)

- 3.1. Full study sample
 - 3.1.1 with Diabetes only (no COPD and no Major Depression)
 - 3.1.2 with Diabetes/COPD and no Major Depression
 - 3.1.3 with Diabetes/Major Depression and no COPD
 - 3.1.4 with Diabetes/COPD/Major Depression
- 3.2. Subsample 1 – without LIS
 - 3.2.1 with Diabetes only (no COPD and no Major Depression)
 - 3.2.2 with Diabetes/COPD and no Major Depression
 - 3.2.3 with Diabetes/Major Depression and no COPD
 - 3.2.4 with Diabetes/COPD/Major Depression
- 3.3. Subsample 2 – with LIS
 - 3.3.1 with Diabetes only (no COPD and no Major Depression)
 - 3.3.2 with Diabetes/COPD and no Major Depression
 - 3.3.3 with Diabetes/Major Depression and no COPD
 - 3.3.4 with Diabetes/COPD/Major Depression

Table Set 4. Duration of Therapy for Drugs Used by Quintile of Medicare Spending (15 tables)

- 4.1. Full study sample
 - 4.1.1 with Diabetes only (no COPD and no Major Depression)
 - 4.1.2 with Diabetes/COPD and no Major Depression
 - 4.1.3 with Diabetes/Major Depression and no COPD
 - 4.1.4 with Diabetes/COPD/Major Depression*
- 4.2. Subsample 1 – without LIS
 - 4.2.1 with Diabetes only (no COPD and no Major Depression)
 - 4.2.2. with Diabetes/COPD and no Major Depression
 - 4.2.3. with Diabetes/Major Depression and no COPD
 - 4.2.4. with Diabetes/COPD/Major Depression
- 4.3. Subsample 2 – with LIS
 - 4.3.1 with Diabetes only (no COPD and no Major Depression)
 - 4.3.2 with Diabetes/COPD and no Major Depression
 - 4.3.3 with Diabetes/Major Depression and no COPD
 - 4.3.4 with Diabetes/COPD/Major Depression

Table Set 5. Annual MPR for Drugs Used by Quintile of Medicare Spending (15 tables)

- 5.1. Full sample

- 5.1.1 with Diabetes only (no COPD and no Major Depression)
- 5.1.2 with Diabetes/COPD and no Major Depression
- 5.1.3 with Diabetes/Major Depression and no COPD
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- 5.2. Subsample 1 – without LIS
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 - 5.3.1 with Diabetes only
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 - 5.3.4 with Diabetes/COPD/Major Depression

Table 6. Regression Results Predicting Any Use of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics

Table 7. Regression Results Predicting Duration of Therapy among Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics

Table 8. Regression Results Predicting Medication Possession Ratios for Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics

Table 9. Drug Coverage Status of Medicare Beneficiaries with Diabetes in 2006

Table Set 10. Prevalence of Use of Drugs for Full-Year and Part-Year PDP and MA-PD Enrollees in 2006

- 10.1. Full study sample
 - 10.1.1 with Diabetes only (no COPD and no Major Depression)
 - 10.1.2 with Diabetes/COPD and no Major Depression
 - 10.1.3 with Diabetes/Major Depression and no COPD
 - 10.1.4 with Diabetes/COPD/Major Depression

Figure 1. Distribution of Medication Possession Ratios for All Users of Oral Antidiabetic Drugs in 2006.

Figure 2. Distribution of Medication Possession Ratios for All Users of Renin-Angiotensin-Aldosterone System Inhibitors (RAASIs) in 2006.

Figure 3. Distribution of Medications Possession Ratio for All Users of Antihyperlipidemics (AHLs) in 2006.

Table 1. Study Exclusion and Inclusion Criteria with Sample Sizes

Characteristics	N (%)
Total Beneficiaries with Diabetes	510,697 (100%)
Exclusion criteria (nonexclusive)	
Died	33,888 (6.6%)
Not covered with Part A for full year	16,304 (0.3%)
Not covered with Part B for full year	17,557 (0.3%)
Not covered with Part D for full year	334,266 (65.5%)
Not enrolled in a PDP for the full year	352,585 (69.1%)
Duplicate IDs	57 (<0.01%)
Incomplete days supply on prescription drug events	184 (0.0%)
Total exclusions	359,237 (70.3%)
Full study sample	151,460 (100%)
Diabetes and no COPD or Major Depression	105,028 (69.3%)
Diabetes + COPD and no Major Depression	17,019 (11.2%)
Diabetes + Major Depression and no COPD	21,985 (14.5%)
Diabetes + COPD + Major Depression	7,428 (4.9%)
Subsample 1 without LIS	50,958 (33.6%)
Diabetes and no COPD or Major Depression	40,744 (80.0%)
Diabetes + COPD and no Major Depression	4,700 (9.2%)
Diabetes + Major Depression and no COPD	4,438 (8.7%)
Diabetes + COPD + Major Depression	1,076 (2.1%)
Subsample 2 with LIS*	100,502 (66.4%)
Diabetes and no COPD or Major Depression	64,284 (64.0%)
Diabetes + COPD and no Major Depression	12,319 (12.3%)
Diabetes + Major Depression and no COPD	17,547 (17.5%)
Diabetes + COPD + Major Depression	6,352 (6.3%)

Source: CCW 5% File, 2006

Acronyms: COPD (chronic obstructive pulmonary disease), LIS (Low Income Subsidy).

* Includes true Duals, deemed Duals, all other LIS enrollees.

Table 2.1 Characteristics of Study Sample (Full Sample)

Characteristics	Full Sample	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Total N	151,460 (100.0%)	105,028 (69.3%)	17,019 (11.2%)	21,985 (14.5%)	7,428 (4.9%)
Diabetes type and severity					
Type I Diabetes (ICD9 250.01)	37,092 (24.5%)	23,651 (22.5%)	4,765 (28.0%)	6,202 (28.2%)	2,474 (33.3%)
Type II Diabetes (ICD9 250.02)	51,992 (34.3%)	34,174 (32.5%)	6,491 (38.1%)	8,273 (37.6%)	3,054 (41.1%)
Both Type I and II	17,123 (11.3%)	10,018 (9.5%)	2,511 (14.8%)	3,143 (14.3%)	1,451 (19.5%)
Diabetes type undetermined	79,499 (52.5%)	47,807 (45.5%)	8,745 (51.4%)	11,332 (51.5%)	4,077 (54.9%)
Diabetes complications	59,293 (39.1%)	38,716 (36.9%)	7,356 (43.2%)	9,589 (43.6%)	3,632 (48.9%)
Chronic kidney disease (ICD9 585.xx)	20,874 (13.8%)	12,795 (12.2%)	3,530 (20.7%)	2,969 (13.5%)	1,580 (21.3%)
Age (%)					
<67 years	40,776 (26.9%)	24,910 (23.7%)	3,990 (23.4%)	9,140 (41.6%)	2,736 (36.8%)
67 – 69 years	16,618 (11.0%)	12,428 (11.8%)	1,739 (10.2%)	1,777 (8.1%)	674 (9.1%)
70 – 74 years	28,127 (18.6%)	20,902 (19.9%)	3,124 (18.4%)	2,953 (13.4%)	1,148 (15.5%)
75 – 79 years	26,154 (17.3%)	19,010 (18.1%)	3,341 (19.6%)	2,730 (12.4%)	1,073 (14.4%)
80+ years	39,785 (26.3%)	27,778 (26.4%)	4,825 (28.4%)	5,385 (24.5%)	1,797 (24.2%)
Sex					
Female	100,210 (66.2%)	68,390 (65.1%)	10,342 (60.8%)	16,177 (73.6%)	5,301 (71.4%)
Male	51,250 (33.8%)	36,638 (34.9%)	6,677 (39.2%)	5,808 (26.4%)	2,127 (28.6%)
Race/ethnicity					
White	109,319 (72.2%)	73,759 (70.2%)	12,859 (75.6%)	16,673 (75.8%)	6,028 (81.2%)
Black	26,399 (17.4%)	19,506 (18.6%)	2,664 (15.7%)	3,379 (15.4%)	850 (11.4%)
Asian	4,685 (3.1%)	3,908 (3.7%)	421 (2.5%)	293 (1.3%)	63 (0.8%)
Hispanic	7,388 (4.9%)	5,105 (4.9%)	768 (4.5%)	1,143 (5.2%)	372 (5.0%)
Other	3,669 (2.4%)	2,750 (2.6%)	307 (1.8%)	497 (2.3%)	115 (1.5%)

Table 2.1 Characteristics of Study Sample (Full Sample) (continued)

Characteristics	Full Sample	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Region					
Midwest	36,106 (23.8%)	24,456 (23.3%)	4,094 (24.1%)	5,758 (26.2%)	1,798 (24.2%)
Northeast	28,176 (18.6%)	19,231 (18.3%)	2,965 (17.4%)	4,602 (20.9%)	1,378 (18.6%)
South	62,590 (41.3%)	43,349 (41.3%)	7,483 (44.0%)	8,399 (38.2%)	3,359 (45.2%)
West	23,656 (15.6%)	17,246 (16.4%)	2,411 (14.2%)	3,128 (14.2%)	871 (11.7%)
Unknown	932 (0.6%)	746 (0.7%)	66 (0.4%)	98 (0.4%)	22 (0.3%)
Number of physician visits					
< 5 physician visits	20,918 (13.9%)	18,277 (17.4%)	751 (4.4%)	1,755 (8.0%)	135 (1.8%)
5 – 9 physician visits	34,657 (23.1%)	28,658 (27.3%)	2,111 (12.4%)	3,518 (16.0%)	370 (5.0%)
10 – 14 physician visits	28,888 (19.2%)	21,608 (20.6%)	2,723 (16.0%)	3,889 (17.7%)	668 (9.0%)
15 + physician visits	65,734 (43.8%)	35,296 (33.6%)	11,407 (67.0%)	12,783 (58.1%)	6,248 (84.1%)
Eye exam ¹	71,307 (47.5%)	50,602 (48.2%)	7,594 (44.6%)	9,872 (44.9%)	3,239 (43.6%)
HbA1C test	84,337 (56.2%)	60,094 (57.2%)	8,917 (52.4%)	11,626 (52.9%)	3,700 (49.8%)
Cholesterol test	75,715 (50.4%)	54,333 (51.7%)	8,115 (47.7%)	9,979 (45.4%)	3,288 (44.3%)
RxHCC counts ^{2,4}	7.8 (3.3)	6.8 (2.9)	9.4 (3.0)	9.3 (3.2)	11.9 (3.2)
HCC counts ^{3,4}	12.0 (5.0)	10.5 (4.4)	15.3 (4.6)	14.0 (4.6)	18.3 (4.5)
Number of maintenance drugs ⁴	9.0 (4.7)	8.0 (4.1)	11.1 (5.0)	10.7 (4.8)	14.0 (5.6)
Number of maintenance drug classes ⁴	8.0 (3.8)	7.2 (3.5)	9.7 (4.1)	9.1 (3.8)	11.5 (4.2)
Hospital days ⁴	4.9 (14.1)	2.6 (9.7)	9.8 (18.2)	7.4 (17.5)	18.1 (27.1)

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

² RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

³ HCC = A count of hierarchical coexisting conditions based on the DCG/HCC model.

⁴ Mean values plus standard deviation.

Table 2.1 Characteristics of Study Sample (Full Sample) (continued)

Characteristics	Full Sample	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Mean Medicare spending by quintile					
Quintile 1	641.8 (336.7)	631.1 (338.4)	744.9 (296.9)	728.2 (310.2)	779.8 (294.1)
Quintile 2	1,959.0 (487.6)	1,945.7 (484.9)	2,038.0 (496.5)	2,002.6 (493.2)	2,108.2 (505.5)
Quintile 3	4,626.1 (1,177.7)	4,567.4 (1,165.9)	4,827.9 (1,204.5)	4,709.0 (1,187.3)	4,968.2 (1,165.9)
Quintile 4	12,672.2 (4,055.5)	12,404.1 (3,993.9)	13,124.9 (4,104.0)	12,746.7 (4,071.9)	13,700.5 (4,157.6)
Quintile 5	51,482.4 (35,946.8)	47,005.4 (30,275.5)	54,458.6 (40,079.4)	50,958.2 (34,217.9)	62,085.4 (44,803.8)

Source: CCW 5% file, 2006

Table 2.2 Characteristics of Study Sample (Subsample without LIS)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Total N	50,958 (100.0%)	40,744 (80.0%)	4,700 (9.2%)	4,438 (8.7%)	1,076 (2.1%)
Diabetes type and severity					
Type I Diabetes (ICD9 250.01)	9,939 (19.5%)	7,528 (18.5%)	1,084 (23.1%)	1,032 (23.3%)	295 (27.4%)
Type II Diabetes (ICD9 250.02)	15,210 (29.8%)	11,687 (28.7%)	1,610 (34.3%)	1,520 (34.2%)	393 (36.5%)
Both Type I and II	4,121 (8.1%)	2,919 (7.2%)	520 (11.1%)	515 (11.6%)	167 (15.5%)
Diabetes type undetermined	29,930 (58.7%)	24,448 (60.0%)	2,526 (53.7%)	2,401 (54.1%)	555 (51.6%)
Diabetes complications (ICD9 250.1 – 250.9)	16,917 (33.2%)	12,979 (31.9%)	1,769 (37.6%)	1,716 (38.7%)	453 (42.1%)
Chronic kidney disease (ICD9 585.xx)	5,634 (11.1%)	3,897 (9.6%)	932 (19.8%)	561 (12.6%)	244 (22.7%)
Age					
<67 years	5,345 (10.5%)	3,980 (9.8%)	456 (9.7%)	771 (17.4%)	138 (12.8%)
67 – 69 years	7,211 (14.2%)	6,000 (14.7%)	542 (11.5%)	552 (12.4%)	117 (10.9%)
70 – 74 years	11,924 (23.4%)	9,894 (24.3%)	959 (20.4%)	879 (19.8%)	192 (17.8%)
75 – 79 years	11,273 (22.1%)	9,075 (22.3%)	1,133 (24.1%)	823 (18.5%)	242 (22.5%)
80+ years	15,205 (29.8%)	11,795 (28.9%)	1,610 (34.3%)	1,413 (31.8%)	387 (36.0%)
Sex					
Female	30,853 (60.5%)	24,428 (60.0%)	2,478 (52.7%)	3,221 (72.6%)	726 (67.5%)
Male	20,105 (39.5%)	16,316 (40.0%)	2,222 (47.3%)	1,217 (27.4%)	350 (32.5%)
Race/ethnicity					
White	46,746 (91.7%)	37,164 (91.2%)	4,393 (93.5%)	4,160 (93.7%)	1,029 (95.6%)
Black	3,009 (5.9%)	2,563 (6.3%)	220 (4.7%)	195 (4.4%)	31 (2.9%)
Asian	258 (0.5%)	230 (0.6%)	13 (0.3%)	14 (0.3%)	1 (0.1%)
Hispanic	327 (0.6%)	267 (0.7%)	26 (0.6%)	28 (0.6%)	6 (0.6%)
Other	618 (1.2%)	520 (1.3%)	48 (1.0%)	41 (0.9%)	9 (0.8%)

Source: CCW 5% file, 2006

Table 2.2 Characteristics of Study Sample (Subsample without LIS) (continued)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Region					
Midwest	15,564 (30.5%)	12,458 (30.6%)	1,382 (29.4%)	1,411 (31.8%)	313 (29.1%)
Northeast	9,099 (17.9%)	7,270 (17.8%)	905 (19.3%)	723 (16.3%)	201 (18.7%)
South	20,024 (39.3%)	15,900 (39.0%)	1,924 (40.9%)	1,745 (39.3%)	455 (42.3%)
West	5,907 (11.6%)	4,827 (11.8%)	459 (9.8%)	518 (11.7%)	103 (9.6%)
Unknown	364 (0.7%)	289 (0.7%)	30 (0.6%)	41 (0.9%)	4 (0.4%)
Number of physician visits in 2006					
< 5 physician visits	7,062 (13.9%)	6,584 (16.2%)	169 (3.6%)	294 (6.6%)	15 (1.4%)
5 – 9 physician visits	13,824 (27.3%)	12,380 (30.4%)	586 (12.5%)	800 (18.0%)	58 (5.4%)
10 – 14 physician visits	10,467 (20.7%)	8,700 (21.4%)	802 (17.1%)	867 (19.5%)	98 (9.1%)
15 + physician visits	19,288 (38.1%)	12,777 (31.4%)	3,135 (66.7%)	2,471 (55.7%)	905 (84.1%)
Eye exam ¹	28,162 (55.6%)	22,837 (56.0%)	2,486 (52.9%)	2,311 (52.1%)	528 (49.1%)
HbA1C test	30,491 (60.2%)	24,800 (60.9%)	2,567 (54.6%)	2,572 (58.0%)	552 (51.3%)
Cholesterol test	28,562 (56.4%)	23,324 (57.2%)	2,427 (51.6%)	2,300 (51.8%)	511 (47.5%)
RxHCC counts ^{2,4}	7.3 (3.1)	6.7 (2.7)	9.2 (3.0)	9.3 (3.1)	11.9 (3.2)
HCC counts ^{3,4}	11.1 (4.7)	10.2 (4.2)	14.8 (4.5)	13.7 (4.6)	18.2 (4.5)
Number of maintenance drugs ⁴	7.7 (3.9)	7.2 (3.6)	9.7 (4.4)	9.5 (4.3)	11.9 (4.7)
Number of maintenance drug classes ⁴	7.1 (3.4)	6.7 (3.2)	8.8 (3.8)	8.4 (3.6)	10.3 (3.8)
Hospital days ⁴	3.1 (9.6)	1.8 (5.9)	8.1 (14.1)	6.3 (15.0)	17.9 (28.2)

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

² RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

³ HCC = A count of hierarchical coexisting conditions based on the DCG/HCC model.

⁴ Mean values plus standard deviation.

Table 2.2 Characteristics of Study Sample (Subsample without LIS) (continued)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Mean Medicare spending by quintile					
Quintile 1	647.1 (334.4)	641.9 (335.0)	738.6 (297.4)	717.8 (322.7)	713.2 (364.7)
Quintile 2	1,962.8 (488.1)	1,952.7 (485.2)	2,038.9 (497.6)	2,043.9 (508.8)	2,088.6 (493.2)
Quintile 3	4,563.9 (1,164.6)	4,521.9 (1,156.0)	4,772.6 (1,184.9)	4,697.0 (1,183.4)	4,856.3 (1,178.7)
Quintile 4	12,468.0 (4,068.9)	12,311.2 (4,035.7)	12,884.3 (4,094.0)	12,562.0 (4,129.5)	13,444.3 (4,166.2)
Quintile 5	46,507.5 (30,096.2)	42,366.6 (24,077.3)	49,121.3 (33,130.5)	49,089.6 (31,580.2)	61,669.0 (44,539.3)

Source: CCW 5% file, 2006

Table 2.3 Characteristics of Study Sample (Subsample with LIS)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Total N	100,502 (100.0%)	64,284 (64.0%)	12,319 (12.3%)	17,547 (17.5%)	6,352 (6.3%)
Diabetes type and severity					
Type I Diabetes (ICD9 250.01)	27,153 (27.0%)	16,123 (25.1%)	3,681 (29.9%)	5,170 (29.5%)	2,179 (34.3%)
Type II Diabetes (ICD9 250.02)	36,782 (36.6%)	22,487 (35.0%)	4,881 (39.6%)	6,753 (38.5%)	2,661 (41.9%)
Both Type I and II	13,002 (12.9%)	32,773 (51.0%)	5,748 (46.7%)	8,252 (47.0%)	2,796 (44.0%)
Diabetes type undetermined	49,569 (49.3%)	31,511 (49.0%)	6,571 (53.3%)	9,295 (53.0%)	3,556 (56.0%)
Diabetes complications (ICD9 250.1 – 250.9)	42,376 (42.2%)	25,737 (40.0%)	5,587 (45.4%)	7,873 (44.9%)	3,179 (50.0%)
Chronic kidney disease (ICD9 585.xx)	15,240 (15.2%)	8,898 (13.8%)	2,598 (21.1%)	2,408 (13.7%)	1,336 (21.0%)
Age (%)					
<67 years	35,431 (35.3%)	20,930 (32.6%)	3,534 (28.7%)	8,369 (47.7%)	2,598 (40.9%)
67 – 69 years	9,407 (9.4%)	6,428 (10.0%)	1,197 (9.7%)	1,225 (7.0%)	557 (8.8%)
70 – 74 years	16,203 (16.1%)	11,008 (17.1%)	2,165 (17.6%)	2,074 (11.8%)	956 (15.1%)
75 – 79 years	14,881 (14.8%)	9,935 (15.5%)	2,208 (17.9%)	1,907 (10.9%)	831 (13.1%)
80+ years	24,580 (24.5%)	15,983 (24.9%)	3,215 (26.1%)	3,972 (22.6%)	1,410 (22.2%)
Sex					
Female	69,357 (69.0%)	43,962 (68.4%)	7,864 (63.8%)	12,956 (73.8%)	4,575 (72.0%)
Male	31,145 (31.0%)	20,322 (31.6%)	4,455 (36.2%)	4,591 (26.2%)	1,777 (28.0%)
Race/ethnicity					
White	62,573 (62.3%)	36,595 (56.9%)	8,466 (68.7%)	12,513 (71.3%)	4,999 (78.7%)
Black	23,390 (23.3%)	16,943 (26.4%)	2,444 (19.8%)	3,184 (18.1%)	819 (12.9%)
Asian	4,427 (4.4%)	3,678 (5.7%)	408 (3.3%)	279 (1.6%)	62 (1.0%)
Hispanic	7,061 (7.0%)	4,838 (7.5%)	742 (6.0%)	1,115 (6.4%)	366 (5.8%)
Other	3,051 (3.0%)	2,230 (3.5%)	259 (2.1%)	456 (2.6%)	106 (1.7%)

Source: CCW 5% file, 2006

Table 2.3 Characteristics of Study Sample (Subsample with LIS) (continued)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Region					
Midwest	20,542 (20.4%)	11,998 (18.7%)	2,712 (22.0%)	4,347 (24.8%)	1,485 (23.4%)
Northeast	19,077 (19.0%)	11,961 (18.6%)	2,060 (16.7%)	3,879 (22.1%)	1,177 (18.5%)
South	42,566 (42.4%)	27,449 (42.7%)	5,559 (45.1%)	6,654 (37.9%)	2,904 (45.7%)
West	17,749 (17.7%)	12,419 (19.3%)	1,952 (15.8%)	2,610 (14.9%)	768 (12.1%)
Unknown	568 (0.6%)	457 (0.7%)	36 (0.3%)	57 (0.3%)	18 (0.3%)
Number of physician visits in 2006					
< 5 physician visits	13,856 (13.9%)	11,693 (18.2%)	582 (4.7%)	1,461 (8.3%)	120 (1.9%)
5 – 9 physician visits	20,833 (20.9%)	16,278 (25.3%)	1,525 (12.4%)	2,718 (15.5%)	312 (4.9%)
10 – 14 physician visits	18,421 (18.5%)	12,908 (20.1%)	1,921 (15.6%)	3,022 (17.2%)	570 (9.0%)
15 + physician visits	46,446 (46.7%)	22,519 (35.0%)	8,272 (67.1%)	10,312 (58.8%)	5,343 (84.1%)
Eye exam ¹	43,145 (43.3%)	27,765 (43.2%)	5,108 (41.5%)	7,561 (43.1%)	2,711 (42.7%)
HbA1C test	53,846 (54.1%)	35,294 (54.9%)	6,350 (51.5%)	9,054 (51.6%)	3,148 (49.6%)
Cholesterol test	47,153 (47.4%)	31,009 (48.2%)	5,688 (46.2%)	7,679 (43.8%)	2,777 (43.7%)
RxHCC counts ^{2,4}	8.0 (3.4)	7.0 (3.0)	9.5 (3.1)	9.4 (3.2)	11.9 (3.2)
HCC counts ^{3,4}	12.4 (5.2)	10.8 (4.6)	15.4 (4.6)	14.0 (4.7)	18.3 (4.5)
Number of maintenance drugs ⁴	9.7 (4.9)	8.5 (4.3)	11.6 (5.2)	11.0 (4.9)	14.4 (5.7)
Number of maintenance drug classes ⁴	8.4 (4.0)	7.6 (3.6)	10.0 (4.1)	9.3 (3.8)	11.7 (4.3)
Hospital days ⁴	5.7 (15.8)	3.1 (11.5)	10.4 (19.5)	7.6 (18.0)	18.2 (26.9)

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

² RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

³ HCC = A count of hierarchical coexisting conditions based on the DCG/HCC model.

⁴ Mean values plus standard deviation.

Table 2.3 Characteristics of Study Sample (Subsample with LIS) (continued)

Characteristics	Total	Diabetes Only	Diabetes + COPD	Diabetes + Major Depression	Diabetes + COPD + Major Depression
Mean Medicare spending by quintile					
Quintile 1	638.4 (338.1)	623.6 (340.5)	747.4 (296.9)	731.1 (306.6)	791.9 (279.9)
Quintile 2	1,956.6 (487.3)	1,940.6 (484.6)	2,037.6 (496.3)	1,990.7 (488.0)	2,111.1 (508.2)
Quintile 3	4,661.6 (1,183.7)	4,598.9 (1,171.8)	4,854.2 (1,213.1)	4,712.3 (1,188.5)	4,988.1 (1,163.4)
Quintile 4	12,757.8 (4,046.9)	12,454.6 (3,970.3)	13,216.9 (4,104.6)	12,787.6 (4,058.4)	13,746.3 (4,155.7)
Quintile 5	53,054.8 (37,470.6)	48,885.7 (32,264.2)	56,224.6 (41,980.9)	51,403.3 (34,805.0)	62,154.1 (44,852.9)

Source: CCW 5% file, 2006

Table 3.1. Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Full Sample)

Drug Class	Number and Percent with any Drug Use					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	151,460 (100.0%)	30,292 (20.0%)	30,292 (20.0%)	30,292 (20.0%)	30,292 (20.0%)	30,292 (20.0%)
Antidiabetic drugs						
Any antidiabetic drug	107,121 (70.7%)	21,067 (69.5%)	21,841 (72.1%)	21,878 (72.2%)	21,552 (71.1%)	20,783 (68.6%)
Any oral antidiabetic drug	91,593 (60.5%)	19,571 (64.6%)	19,439 (64.2%)	19,119 (63.1%)	18,062 (59.6%)	15,402 (50.8%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	50,400 (33.3%)	10,045 (33.2%)	10,026 (33.1%)	9,836 (32.5%)	9,964 (32.9%)	10,529 (34.8%)
Sulfonylureas	14,270 (9.4%)	3,340 (11.0%)	2,856 (9.4%)	2,779 (9.2%)	2,740 (9.0%)	2,555 (8.4%)
Metformin	13,700 (9.1%)	3,705 (12.2%)	3,317 (11.0%)	2,902 (9.6%)	2,382 (7.9%)	1,394 (4.6%)
Thiazolidinediones (TZD)	5,994 (4.0%)	1,369 (4.5%)	1,277 (4.2%)	1,215 (4.0%)	1,145 (3.8%)	988 (3.3%)
Insulin	15,528 (10.3%)	1,496 (4.9%)	2,402 (7.9%)	2,759 (9.1%)	3,490 (11.5%)	5,381 (17.8%)
All others ¹	908(0.6%)	135 (0.4%)	174 (0.6%)	181 (0.6%)	207 (0.7%)	211 (0.7%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	56,721 (37.4%)	11,022 (36.4%)	11,815 (39.0%)	12,042 (39.8%)	11,588 (38.3%)	10,254 (33.9%)
Sulfonylureas + Metformin	13,453(8.9%)	3,671 (12.1%)	3,168 (10.5%)	2,810 (9.3%)	2,353 (7.8%)	1,451 (4.8%)
Sulfonylureas + Metformin + TZD	8,137(5.4%)	2,008 (6.6%)	1,995 (6.6%)	1,815 (6.0%)	1,473 (4.9%)	846 (2.8%)
Sulfonylureas + TZD	5,112(3.4%)	1,105 (3.6%)	1,073 (3.5%)	1,095 (3.6%)	1,043 (3.4%)	796 (2.6%)
Metformin + TZD	5,441(3.6%)	1,434 (4.7%)	1,304 (4.3%)	1,217 (4.0%)	944 (3.1%)	542 (1.8%)
Insulin + any other antidiabetic drug(s)	21,086(13.9%)	2,236 (7.4%)	3,486 (11.5%)	4,256 (14.0%)	5,006 (16.5%)	6,102 (20.1%)
All other combinations	3,492(2.3%)	568 (1.9%)	789 (2.6%)	849 (2.8%)	769 (2.5%)	517 (1.7%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	98,064 (64.7%)	18,672 (61.6%)	19,858 (65.6%)	19,901 (65.7%)	19,960 (65.9%)	19,673 (64.9%)
ACE inhibitors only	61,370 (40.52%)	12,467 (41.2%)	12,512 (41.3%)	11,976 (39.5%)	11,989 (39.6%)	12,426 (41.0%)
Angiotensin Receptor Blocker only (ARB)	27,557 (18.19%)	4,960 (16.4%)	5,696 (18.8%)	6,131 (20.2%)	5,912 (19.5%)	4,858 (16.0%)
Both ACE inhibitors + ARBs	9,137 (6.03%)	1,245 (4.1%)	1,650 (5.4%)	1,794 (5.9%)	2,059 (6.8%)	2,389 (7.9%)
Antihyperlipidemics (AHL D)						
Any AHL D	91,372 (60.3%)	17,328 (57.2%)	19,058 (62.9%)	19,253 (63.6%)	18,502 (61.1%)	17,231 (56.9%)
Statins	83,975 (55.4%)	16,031 (52.9%)	17,538 (57.9%)	17,629 (58.2%)	16,927 (55.9%)	15,850 (52.3%)
Other lipid lowering drugs ²	7,397 (4.9%)	1,297 (4.3%)	1,520 (5.0%)	1,624 (5.4%)	1,575 (5.2%)	1,381 (4.6%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 3.1.1 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Sample with Diabetes only)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	105,028 (100.0%)	27,169 (25.9%)	24,808 (23.6%)	21,753 (20.7%)	17,634 (16.8%)	13,664 (13.0%)
Antidiabetic drugs						
Any antidiabetic drug	75,718 (72.1%)	19,057 (70.1%)	18,199 (73.4%)	16,033 (73.7%)	12,841 (72.8%)	9,588 (70.2%)
Any oral antidiabetic drug	65,805 (62.7%)	17,743 (65.3%)	16,206 (65.3%)	14,043 (64.6%)	10,795 (61.2%)	7,018 (51.4%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	35,491 (33.8%)	9,051 (33.3%)	8,337 (33.6%)	7,165 (32.9%)	5,916 (33.5%)	5,022 (36.8%)
Sulfonylureas	10,437 (9.9%)	3,053 (11.2%)	2,399 (9.7%)	2,075 (9.5%)	1,651 (9.4%)	1,259 (9.2%)
Metformin	10,112 (9.6%)	3,317 (12.2%)	2,733 (11.0%)	2,080 (9.6%)	1,380 (7.8%)	602 (4.4%)
Thiazolidinediones (TZD)	4,390 (4.2%)	1,248 (4.6%)	1,061 (4.3%)	884 (4.1%)	712 (4.0%)	485 (3.5%)
Insulin	9,913 (9.4%)	1,314 (4.8%)	1,993 (8.0%)	1,990 (9.1%)	2,046 (11.6%)	2,570 (18.8%)
All others ¹	639 (0.6%)	119 (0.4%)	151 (0.6%)	136 (0.6%)	127 (0.7%)	106 (0.8%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	40,227 (38.3%)	10,006 (36.8%)	9,862 (39.8%)	8,868 (40.8%)	6,925 (39.3%)	4,566 (33.4%)
Sulfonylureas + Metformin	10,409 (9.9%)	3,366 (12.4%)	2,718 (11.0%)	2,151 (9.9%)	1,462 (8.3%)	712 (5.2%)
Sulfonylureas + Metformin + TZD	6,281 (6.0%)	1,833 (6.7%)	1,703 (6.9%)	1,383 (6.4%)	928 (5.3%)	434 (3.2%)
Sulfonylureas + TZD	3,885 (3.7%)	1,020 (3.8%)	902 (3.6%)	856 (3.9%)	679 (3.9%)	428 (3.1%)
Metformin + TZD	4,085 (3.9%)	1,296 (4.8%)	1,085 (4.4%)	886 (4.1%)	568 (3.2%)	250 (1.8%)
Insulin + any other antidiabetic drug(s)	13,014 (12.4%)	1,970 (7.3%)	2,804 (11.3%)	2,938 (13.5%)	2,824 (16.0%)	2,478 (18.1%)
All other combinations	2,553 (2.4%)	521 (1.9%)	650 (2.6%)	654 (3.0%)	464 (2.6%)	264 (1.9%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	69,546 (66.2%)	17,012 (62.6%)	16,673 (67.2%)	14,734 (67.7%)	12,090 (68.6%)	9,037 (66.1%)
ACE inhibitors only	43,124 (41.1%)	11,312 (41.6%)	10,390 (41.9%)	8,722 (40.1%)	7,143 (40.5%)	5,557 (40.7%)
Angiotensin Receptor Blocker only (ARB)	20,114 (19.2%)	4,548 (16.7%)	4,878 (19.7%)	4,623 (21.3%)	3,654 (20.7%)	2,411 (17.6%)
Both ACE inhibitors + ARBs	6,308 (6.0%)	1,152 (4.2%)	1,405 (5.7%)	1,389 (6.4%)	1,293 (7.3%)	1,069 (7.8%)
Antihyperlipidemics (AHL D)						
Any AHL D	64,523 (61.4%)	15,663 (57.7%)	15,911 (64.1%)	14,122 (64.9%)	10,889 (61.8%)	7,938 (58.1%)
Statins	59,406 (56.6%)	14,490 (53.3%)	14,627 (59.0%)	12,953 (59.5%)	10,009 (56.8%)	7,327 (53.6%)
Other lipid lowering drugs ²	5,117 (4.9%)	1,173 (4.3%)	1,284 (5.2%)	1,169 (5.4%)	880 (5.0%)	611 (4.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.1.2 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and no Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	17,019 (100.0%)	874 (5.1%)	1,623 (9.5%)	3,089 (18.2%)	5,142 (30.2%)	6,291 (37.0%)
Antidiabetic drugs						
Any antidiabetic drug	11,346 (66.7%)	483 (55.3%)	996 (61.4%)	2,083 (67.4%)	3,545 (68.9%)	4,239 (67.4%)
Any oral antidiabetic drug	9,348 (54.9%)	448 (51.3%)	899 (55.4%)	1,845 (59.7%)	2,968 (57.7%)	3,188 (50.7%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	5,589 (32.8%)	242 (27.7%)	492 (30.3%)	985 (31.9%)	1,742 (33.9%)	2,128 (33.8%)
Sulfonylureas	1,696 (10.0%)	89 (10.2%)	169 (10.4%)	317 (10.3%)	555 (10.8%)	566 (9.0%)
Metformin	1,171 (6.9%)	82 (9.4%)	152 (9.4%)	285 (9.2%)	385 (7.5%)	267 (4.2%)
Thiazolidinediones (TZD)	610 (3.6%)	33 (3.8%)	68 (4.2%)	126 (4.1%)	182 (3.5%)	201 (3.2%)
Insulin	1,998 (11.7%)	35 (4.0%)	97 (6.0%)	238 (7.7%)	577 (11.2%)	1,051 (16.7%)
All others ¹	114 (0.7%)	§	§	19 (0.6%)	43 (0.8%)	43 (0.7%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	5,757 (33.8%)	241 (27.6%)	504 (31.1%)	1,098 (35.5%)	1,803 (35.1%)	2,111 (33.6%)
Sulfonylureas + Metformin	1,165 (6.9%)	75 (8.6%)	123 (7.6%)	269 (8.7%)	383 (7.4%)	315 (5.0%)
Sulfonylureas + Metformin + TZD	679 (4.0%)	33 (3.8%)	91 (5.6%)	163 (5.3%)	220 (4.3%)	172 (2.7%)
Sulfonylureas + TZD	503 (3.0%)	30 (3.4%)	59 (3.6%)	93 (3.0%)	157 (3.1%)	164 (2.6%)
Metformin + TZD	437 (2.6%)	34 (3.9%)	61 (3.8%)	109 (3.5%)	134 (2.6%)	99 (1.6%)
Insulin + any other antidiabetic drug(s)	2,618 (15.4%)	56 (6.4%)	132 (8.1%)	388 (12.6%)	781 (15.2%)	1,261 (20.0%)
All other combinations	355 (2.1%)	13 (1.5%)	38 (2.3%)	76 (2.5%)	128 (2.5%)	100 (1.6%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	10,812 (63.5%)	463 (53.0%)	964 (59.4%)	1,903 (61.6%)	3,350 (65.1%)	4,132 (65.7%)
ACE inhibitors only	6,568 (38.6%)	298 (34.1%)	596 (36.7%)	1,139 (36.9%)	1,962 (38.2%)	2,573 (40.9%)
Angiotensin Receptor Blocker only (ARB)	3,074 (18.1%)	142 (16.2%)	277 (17.1%)	608 (19.7%)	1,026 (20.0%)	1,021 (16.2%)
Both ACE inhibitors + ARBs	1,170 (6.9%)	23 (2.6%)	91 (5.6%)	156 (5.1%)	362 (7.0%)	538 (8.6%)
Antihyperlipidemics (AHLI)						
Any AHLI	10,150 (59.6%)	453 (51.8%)	959 (59.1%)	1,868 (60.5%)	3,177 (61.8%)	3,693 (58.7%)
Statins	9,351 (54.9%)	419 (47.9%)	899 (55.4%)	1,725 (55.8%)	2,901 (56.4%)	3,407 (54.2%)
Other lipid lowering drugs ²	799 (4.7%)	34 (3.9%)	60 (3.7%)	143 (4.6%)	276 (5.4%)	286 (4.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.1.3 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Sample with Major Depression and no COPD)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	21,985 (100.0%)	2,132 (9.7%)	3,557 (16.2%)	4,676 (21.3%)	5,585 (25.4%)	6,035 (27.5%)
Antidiabetic drugs						
Any antidiabetic drug	15,144 (68.9%)	1,461 (68.5%)	2,458 (69.1%)	3,240 (69.3%)	3,883 (69.5%)	4,102 (68.0%)
Any oral antidiabetic drug	12,559 (57.1%)	1,323 (62.1%)	2,171 (61.0%)	2,775 (59.3%)	3,246 (58.1%)	3,044 (50.4%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	6,972 (31.7%)	716 (33.6%)	1,104 (31.0%)	1,448 (31.0%)	1,694 (30.3%)	2,010 (33.3%)
Sulfonylureas	1,601 (7.3%)	185 (8.7%)	266 (7.5%)	326 (7.0%)	388 (6.9%)	436 (7.2%)
Metformin	1,902 (8.7%)	295 (13.8%)	401 (11.3%)	454 (9.7%)	456 (8.2%)	296 (4.9%)
Thiazolidinediones (TZD)	769 (3.5%)	85 (4.0%)	135 (3.8%)	182 (3.9%)	180 (3.2%)	187 (3.1%)
Insulin	2,585 (11.8%)	138 (6.5%)	287 (8.1%)	465 (9.9%)	637 (11.4%)	1,058 (17.5%)
All others ¹	115 (0.5%)	13 (0.6%)	15 (0.4%)	21 (0.4%)	33 (0.6%)	33 (0.5%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	8,172 (37.2%)	745 (34.9%)	1,354 (38.1%)	1,792 (38.3%)	2,189 (39.2%)	2,092 (34.7%)
Sulfonylureas + Metformin	1,522 (6.9%)	221 (10.4%)	306 (8.6%)	338 (7.2%)	392 (7.0%)	265 (4.4%)
Sulfonylureas + Metformin + TZD	974 (4.4%)	138 (6.5%)	192 (5.4%)	238 (5.1%)	261 (4.7%)	145 (2.4%)
Sulfonylureas + TZD	584 (2.7%)	54 (2.5%)	108 (3.0%)	123 (2.6%)	166 (3.0%)	133 (2.2%)
Metformin + TZD	747 (3.4%)	101 (4.7%)	149 (4.2%)	191 (4.1%)	191 (3.4%)	115 (1.9%)
Insulin + any other antidiabetic drug(s)	3,886 (17.7%)	198 (9.3%)	507 (14.3%)	799 (17.1%)	1,041 (18.6%)	1,341 (22.2%)
All other combinations	459 (2.1%)	33 (1.5%)	92 (2.6%)	103 (2.2%)	138 (2.5%)	93 (1.5%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	13,103 (59.6%)	1,142 (53.6%)	2,057 (57.8%)	2,797 (59.8%)	3,364 (60.2%)	3,743 (62.0%)
ACE inhibitors only	8,630 (39.3%)	821 (38.5%)	1,417 (39.8%)	1,811 (38.7%)	2,125 (38.0%)	2,456 (40.7%)
Angiotensin Receptor Blocker only (ARB)	3,312 (15.1%)	256 (12.0%)	500 (14.1%)	770 (16.5%)	932 (16.7%)	854 (14.2%)
Both ACE inhibitors + ARBs	1,161 (5.3%)	65 (3.0%)	140 (3.9%)	216 (4.6%)	307 (5.5%)	433 (7.2%)
Antihyperlipidemics (AHL D)						
Any AHL D	12,561 (57.1%)	1,155 (54.2%)	2,035 (57.2%)	2,815 (60.2%)	3,290 (58.9%)	3,266 (54.1%)
Statins	11,427 (52.0%)	1,066 (50.0%)	1,871 (52.6%)	2,538 (54.3%)	2,969 (53.2%)	2,983 (49.4%)
Other lipid lowering drugs ²	1,134 (5.2%)	89 (4.2%)	164 (4.6%)	277 (5.9%)	321 (5.7%)	283 (4.7%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.1.4 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	7,428 (100.0%)	117 (1.6%)	304 (4.1%)	774 (10.4%)	1,931 (26.0%)	4,302 (57.9%)
Antidiabetic drugs						
Any antidiabetic drug	4,913 (66.1%)	66 (56.4%)	188 (61.8%)	522 (67.4%)	1,283 (66.4%)	2,854 (66.3%)
Any oral antidiabetic drug	3,881 (52.2%)	57 (48.7%)	163 (53.6%)	456 (58.9%)	1,053 (54.5%)	2,152 (50.0%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	2,348 (31.6%)	36 (30.8%)	93 (30.6%)	238 (30.7%)	612 (31.7%)	1,369 (31.8%)
Sulfonylureas	536 (7.2%)	13 (11.1%)	22 (7.2%)	61 (7.9%)	146 (7.6%)	294 (6.8%)
Metformin	515 (6.9%)	11 (9.4%)	31 (10.2%)	83 (10.7%)	161 (8.3%)	229 (5.3%)
Thiazolidinediones (TZD)	225 (3.0%)	§	13 (4.3%)	23 (3.0%)	71 (3.7%)	115 (2.7%)
Insulin	1,032 (13.9%)	§	25 (8.2%)	66 (8.5%)	230 (11.9%)	702 (16.3%)
All others ¹	40 (0.5%)	§	§	§	§	29 (0.7%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	2,565 (34.5%)	30 (25.6%)	95 (31.3%)	284 (36.7%)	671 (34.7%)	1,485 (34.5%)
Sulfonylureas + Metformin	357 (4.8%)	§	21 (6.9%)	52 (6.7%)	116 (6.0%)	159 (3.7%)
Sulfonylureas + Metformin + TZD	203 (2.7%)	§	§	31 (4.0%)	64 (3.3%)	95 (2.2%)
Sulfonylureas + TZD	140 (1.9%)	§	§	23 (3.0%)	41 (2.1%)	71 (1.7%)
Metformin + TZD	172 (2.3%)	§	§	31 (4.0%)	51 (2.6%)	78 (1.8%)
Insulin + any other antidiabetic drug(s)	1,568 (21.1%)	12 (10.3%)	43 (14.1%)	131 (16.9%)	360 (18.6%)	1,022 (23.8%)
All other combinations	125 (1.7%)	§	§	16 (2.1%)	39 (2.0%)	60 (1.4%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	4,603 (62.0%)	55 (47.0%)	164 (53.9%)	467 (60.3%)	1,156 (59.9%)	2,761 (64.2%)
ACE inhibitors only	3,048 (41.0%)	36 (30.8%)	109 (35.9%)	304 (39.3%)	759 (39.3%)	1,840 (42.8%)
Angiotensin Receptor Blocker only (ARB)	1,057 (14.2%)	14 (12.0%)	41 (13.5%)	130 (16.8%)	300 (15.5%)	572 (13.3%)
Both ACE inhibitors + ARBs	498 (6.7%)	§	14 (4.6%)	33 (4.3%)	97 (5.0%)	349 (8.1%)
Antihyperlipidemics (AHL)						
Any AHL	4,138 (55.7%)	57 (48.7%)	153 (50.3%)	448 (57.9%)	1,146 (59.3%)	2,334 (54.3%)
Statins	3,791 (51.0%)	56 (47.9%)	141 (46.4%)	413 (53.4%)	1,048 (54.3%)	2,133 (49.6%)
Other lipid lowering drugs ²	347 (4.7%)	§	12 (3.9%)	35 (4.5%)	98 (5.1%)	201 (4.7%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.2 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	50,958 (100.0%)	11,926 (23.4%)	11,796 (23.2%)	11,021 (21.6%)	8,940 (17.5%)	7,275 (14.3%)
Antidiabetic drugs						
Any antidiabetic drug	35,116 (68.9%)	8,154 (68.4%)	8,237 (69.8%)	7,709 (69.9%)	6,131 (68.6%)	4,885 (67.1%)
Any oral antidiabetic drug	31,155 (61.1%)	7,716 (64.7%)	7,460 (63.2%)	6,838 (62.0%)	5,254 (58.8%)	3,887 (53.4%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	17,180 (33.7%)	3,991 (33.5%)	3,950 (33.5%)	3,663 (33.2%)	3,022 (33.8%)	2,554 (35.1%)
Sulfonylureas	5,516 (10.8%)	1,411 (11.8%)	1,159 (9.8%)	1,151 (10.4%)	977 (10.9%)	818 (11.2%)
Metformin	5,289 (10.4%)	1,564 (13.1%)	1,416 (12.0%)	1,128 (10.2%)	763 (8.5%)	418 (5.7%)
Thiazolidinediones (TZD)	2,032 (4.0%)	517 (4.3%)	512 (4.3%)	426 (3.9%)	333 (3.7%)	244 (3.4%)
Insulin	3,961 (7.8%)	438 (3.7%)	777 (6.6%)	871 (7.9%)	877 (9.8%)	998 (13.7%)
All others ¹	382 (0.8%)	61 (0.5%)	86 (0.7%)	87 (0.8%)	72 (0.8%)	76 (1.0%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	17,936 (35.2%)	4,163 (34.9%)	4,287 (36.3%)	4,046 (36.7%)	3,109 (34.8%)	2,331 (32.0%)
Sulfonylureas + Metformin	5,279 (10.4%)	1,498 (12.6%)	1,369 (11.6%)	1,132 (10.3%)	785 (8.8%)	495 (6.8%)
Sulfonylureas + Metformin + TZD	2,739 (5.4%)	754 (6.3%)	715 (6.1%)	609 (5.5%)	426 (4.8%)	235 (3.2%)
Sulfonylureas + TZD	1,880 (3.7%)	482 (4.0%)	419 (3.6%)	415 (3.8%)	348 (3.9%)	216 (3.0%)
Metformin + TZD	1,836 (3.6%)	543 (4.6%)	470 (4.0%)	409 (3.7%)	260 (2.9%)	154 (2.1%)
Insulin + any other antidiabetic drug(s)	4,889 (9.6%)	639 (5.4%)	985 (8.4%)	1,128 (10.2%)	1,047 (11.7%)	1,090 (15.0%)
All other combinations	1,313 (2.6%)	247 (2.1%)	329 (2.8%)	353 (3.2%)	243 (2.7%)	141 (1.9%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	33,568 (65.9%)	7,624 (63.9%)	7,864 (66.7%)	7,257 (65.8%)	5,983 (66.9%)	4,840 (66.5%)
ACE inhibitors only	20,743 (40.7%)	5,045 (42.3%)	4,811 (40.8%)	4,292 (38.9%)	3,522 (39.4%)	3,073 (42.2%)
Angiotensin Receptor Blocker only (ARB)	10,074 (19.8%)	2,121 (17.8%)	2,416 (20.5%)	2,343 (21.3%)	1,898 (21.2%)	1,296 (17.8%)
Both ACE inhibitors + ARBs	2,751 (5.4%)	458 (3.8%)	637 (5.4%)	622 (5.6%)	563 (6.3%)	471 (6.5%)
Antihyperlipidemics (AHL D)						
Any AHL D	32,711 (64.2%)	7,342 (61.6%)	7,788 (66.0%)	7,334 (66.5%)	5,697 (63.7%)	4,550 (62.5%)
Statins	29,698 (58.3%)	6,730 (56.4%)	7,076 (60.0%)	6,630 (60.2%)	5,133 (57.4%)	4,129 (56.8%)
Other lipid lowering drugs ²	3,013 (5.9%)	612 (5.1%)	712 (6.0%)	704 (6.4%)	564 (6.3%)	421 (5.8%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.2.1 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Diabetes only)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	40,744 (100.0%)	11,185 (27.5%)	10,493 (25.8%)	8,914 (21.9%)	6,211 (15.2%)	3,941 (9.7%)
Antidiabetic drugs						
Any antidiabetic drug	28,488 (69.9%)	7,687 (68.7%)	7,430 (70.8%)	6,327 (71.0%)	4,353 (70.1%)	2,691 (68.3%)
Any oral antidiabetic drug	25,502 (62.6%)	7,284 (65.1%)	6,716 (64.0%)	5,606 (62.9%)	3,733 (60.1%)	2,163 (54.9%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	13,816 (33.9%)	3,752 (33.5%)	3,556 (33.9%)	2,990 (33.5%)	2,134 (34.4%)	1,384 (35.1%)
Sulfonylureas	4,431 (10.9%)	1,334 (11.9%)	1,039 (9.9%)	938 (10.5%)	672 (10.8%)	448 (11.4%)
Metformin	4,431 (10.9%)	1,468 (13.1%)	1,265 (12.1%)	917 (10.3%)	546 (8.8%)	235 (6.0%)
Thiazolidinediones (TZD)	1,669 (4.1%)	489 (4.4%)	459 (4.4%)	342 (3.8%)	251 (4.0%)	128 (3.2%)
Insulin	2,986 (7.3%)	403 (3.6%)	714 (6.8%)	721 (8.1%)	620 (10.0%)	528 (13.4%)
All others ¹	299 (0.7%)	58 (0.5%)	79 (0.8%)	72 (0.8%)	45 (0.7%)	45 (1.1%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	14,672 (36.0%)	3,935 (35.2%)	3,874 (36.9%)	3,337 (37.4%)	2,219 (35.7%)	1,307 (33.2%)
Sulfonylureas + Metformin	4,453 (10.9%)	1,412 (12.6%)	1,242 (11.8%)	943 (10.6%)	558 (9.0%)	298 (7.6%)
Sulfonylureas + Metformin + TZD	2,329 (5.7%)	723 (6.5%)	653 (6.2%)	512 (5.7%)	304 (4.9%)	137 (3.5%)
Sulfonylureas + TZD	1,589 (3.9%)	459 (4.1%)	373 (3.6%)	362 (4.1%)	261 (4.2%)	134 (3.4%)
Metformin + TZD	1,586 (3.9%)	509 (4.6%)	428 (4.1%)	345 (3.9%)	201 (3.2%)	103 (2.6%)
Insulin + any other antidiabetic drug(s)	3,615 (8.9%)	593 (5.3%)	881 (8.4%)	879 (9.9%)	720 (11.6%)	542 (13.8%)
All other combinations	1,100 (2.7%)	239 (2.1%)	297 (2.8%)	296 (3.3%)	175 (2.8%)	93 (2.4%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	27,198 (66.8%)	7,206 (64.4%)	7,117 (67.8%)	5,951 (66.8%)	4,251 (68.4%)	2,673 (67.8%)
ACE inhibitors only	16,788 (41.2%)	4,756 (42.5%)	4,342 (41.4%)	3,512 (39.4%)	2,499 (40.2%)	1,679 (42.6%)
Angiotensin Receptor Blocker only (ARB)	8,213 (20.2%)	2,012 (18.0%)	2,197 (20.9%)	1,911 (21.4%)	1,345 (21.7%)	748 (19.0%)
Both ACE inhibitors + ARBs	2,197 (5.4%)	438 (3.9%)	578 (5.5%)	528 (5.9%)	407 (6.6%)	246 (6.2%)
Antihyperlipidemics (AHL D)						
Any AHL D	26,551 (65.2%)	6,912 (61.8%)	6,990 (66.6%)	6,026 (67.6%)	4,042 (65.1%)	2,581 (65.5%)
Statins	24,135 (59.2%)	6,339 (56.7%)	6,341 (60.4%)	5,444 (61.1%)	3,651 (58.8%)	2,360 (59.9%)
Other lipid lowering drugs ²	2,416 (5.9%)	573 (5.1%)	649 (6.2%)	582 (6.5%)	391 (6.3%)	221 (5.6%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.2.2 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and no Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	4,700 (100.0%)	252 (5.4%)	468 (10.0%)	993 (21.1%)	1,423 (30.3%)	1,564 (33.3%)
Antidiabetic drugs						
Any antidiabetic drug	3,013 (64.1%)	136 (54.0%)	277 (59.2%)	642 (64.7%)	929 (65.3%)	1,029 (65.8%)
Any oral antidiabetic drug	2,569 (54.7%)	130 (51.6%)	267 (57.1%)	576 (58.0%)	788 (55.4%)	808 (51.7%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	1,563 (33.3%)	65 (25.8%)	144 (30.8%)	310 (31.2%)	493 (34.6%)	551 (35.2%)
Sulfonylureas	550 (11.7%)	31 (12.3%)	58 (12.4%)	110 (11.1%)	170 (11.9%)	181 (11.6%)
Metformin	359 (7.6%)	20 (7.9%)	51 (10.9%)	92 (9.3%)	115 (8.1%)	81 (5.2%)
Thiazolidinediones (TZD)	162 (3.5%)	§	23 (4.9%)	33 (3.3%)	47 (3.3%)	52 (3.3%)
Insulin	444 (9.5%)	§	§	66 (6.6%)	141 (9.9%)	221 (14.1%)
All others ¹	48 (1.0%)	§	§	§	20 (1.4%)	16 (1.0%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	1,450 (30.9%)	71 (28.2%)	133 (28.4%)	332 (33.4%)	436 (30.6%)	478 (30.6%)
Sulfonylureas + Metformin	390 (8.3%)	26 (10.3%)	51 (10.9%)	90 (9.1%)	114 (8.0%)	109 (7.0%)
Sulfonylureas + Metformin + TZD	183 (3.9%)	§	22 (4.7%)	46 (4.6%)	65 (4.6%)	41 (2.6%)
Sulfonylureas + TZD	130 (2.8%)	§	17 (3.6%)	19 (1.9%)	45 (3.2%)	39 (2.5%)
Metformin + TZD	89 (1.9%)	11 (4.4%)	§	26 (2.6%)	26 (1.8%)	18 (1.2%)
Insulin + any other antidiabetic drug(s)	562 (12.0%)	§	24 (5.1%)	119 (12.0%)	160 (11.2%)	249 (15.9%)
All other combinations	96 (2.0%)	§	11 (2.4%)	32 (3.2%)	26 (1.8%)	22 (1.4%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	2,936 (62.5%)	135 (53.6%)	282 (60.3%)	598 (60.2%)	922 (64.8%)	999 (63.9%)
ACE inhibitors only	1,764 (37.5%)	89 (35.3%)	161 (34.4%)	353 (35.5%)	522 (36.7%)	639 (40.9%)
Angiotensin Receptor Blocker only (ARB)	907 (19.3%)	39 (15.5%)	96 (20.5%)	206 (20.7%)	313 (22.0%)	253 (16.2%)
Both ACE inhibitors + ARBs	265 (5.6%)	§	25 (5.3%)	39 (3.9%)	87 (6.1%)	107 (6.8%)
Antihyperlipidemics (AHL D)						
Any AHL D	2,879 (61.3%)	141 (56.0%)	297 (63.5%)	605 (60.9%)	869 (61.1%)	967 (61.8%)
Statins	2,593 (55.2%)	127 (50.4%)	271 (57.9%)	544 (54.8%)	786 (55.2%)	865 (55.3%)
Other lipid lowering drugs ²	286 (6.1%)	14 (5.6%)	26 (5.6%)	61 (6.1%)	83 (5.8%)	102 (6.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.2.3 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Major Depression and no COPD)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	4,438 (100.0%)	471 (10.6%)	796 (17.9%)	997 (22.5%)	1,013 (22.8%)	1,161 (26.2%)
Antidiabetic drugs						
Any antidiabetic drug	2,944 (66.3%)	321 (68.2%)	512 (64.3%)	670 (67.2%)	658 (65.0%)	783 (67.4%)
Any oral antidiabetic drug	2,541 (57.3%)	293 (62.2%)	460 (57.8%)	594 (59.6%)	578 (57.1%)	616 (53.1%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	1,443 (32.5%)	170 (36.1%)	242 (30.4%)	326 (32.7%)	290 (28.6%)	415 (35.7%)
Sulfonylureas	411 (9.3%)	45 (9.6%)	60 (7.5%)	90 (9.0%)	99 (9.8%)	117 (10.1%)
Metformin	438 (9.9%)	76 (16.1%)	97 (12.2%)	114 (11.4%)	78 (7.7%)	73 (6.3%)
Thiazolidinediones (TZD)	164 (3.7%)	19 (4.0%)	28 (3.5%)	41 (4.1%)	26 (2.6%)	50 (4.3%)
Insulin	403 (9.1%)	28 (5.9%)	52 (6.5%)	76 (7.6%)	80 (7.9%)	167 (14.4%)
All others ¹	27 (0.6%)	§	§	§	§	§
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	1,501 (33.8%)	151 (32.1%)	270 (33.9%)	344 (34.5%)	368 (36.3%)	368 (31.7%)
Sulfonylureas + Metformin	376 (8.5%)	58 (12.3%)	73 (9.2%)	93 (9.3%)	91 (9.0%)	61 (5.3%)
Sulfonylureas + Metformin + TZD	193 (4.4%)	20 (4.2%)	39 (4.9%)	46 (4.6%)	50 (4.9%)	38 (3.3%)
Sulfonylureas + TZD	141 (3.2%)	13 (2.8%)	28 (3.5%)	29 (2.9%)	36 (3.6%)	35 (3.0%)
Metformin + TZD	138 (3.1%)	22 (4.7%)	34 (4.3%)	33 (3.3%)	25 (2.5%)	24 (2.1%)
Insulin + any other antidiabetic drug(s)	548 (12.4%)	35 (7.4%)	76 (9.5%)	119 (11.9%)	127 (12.5%)	191 (16.5%)
All other combinations	105 (2.4%)	§	20 (2.5%)	24 (2.4%)	39 (3.8%)	19 (1.6%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	2,766 (62.3%)	273 (58.0%)	446 (56.0%)	632 (63.4%)	636 (62.8%)	779 (67.1%)
ACE inhibitors only	1,773 (40.0%)	195 (41.4%)	296 (37.2%)	385 (38.6%)	388 (38.3%)	509 (43.8%)
Angiotensin Receptor Blocker only (ARB)	763 (17.2%)	67 (14.2%)	118 (14.8%)	201 (20.2%)	188 (18.6%)	189 (16.3%)
Both ACE inhibitors + ARBs	230 (5.2%)	11 (2.3%)	32 (4.0%)	46 (4.6%)	60 (5.9%)	81 (7.0%)
Antihyperlipidemics (AHL D)						
Any AHL D	2,684 (60.5%)	279 (59.2%)	480 (60.3%)	632 (63.4%)	611 (60.3%)	682 (58.7%)
Statins	2,430 (54.8%)	255 (54.1%)	443 (55.7%)	576 (57.8%)	538 (53.1%)	618 (53.2%)
Other lipid lowering drugs ²	254 (5.7%)	24 (5.1%)	37 (4.6%)	56 (5.6%)	73 (7.2%)	64 (5.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.2.4 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	1,076 (100.0%)	18 (1.7%)	39 (3.6%)	117 (10.9%)	293 (27.2%)	609 (56.6%)
Antidiabetic drugs						
Any antidiabetic drug	671 (62.4%)	§	18 (46.2%)	70 (59.8%)	191 (65.2%)	382 (62.7%)
Any oral antidiabetic drug	543 (50.5%)	§	17 (43.6%)	62 (53.0%)	155 (52.9%)	300 (49.3%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	358 (33.3%)	§	§	37 (31.6%)	105 (35.8%)	204 (33.5%)
Sulfonylureas	124 (11.5%)	§	§	13 (11.1%)	36 (12.3%)	72 (11.8%)
Metformin	61 (5.7%)	§	§	§	24 (8.2%)	29 (4.8%)
Thiazolidinediones (TZD)	37 (3.4%)	§	§	§	§	14 (2.3%)
Insulin	128 (11.9%)	§	§	§	36 (12.3%)	82 (13.5%)
All others ¹	§	§	§	§	§	§
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	313 (29.1%)	§	§	33 (28.2%)	86 (29.4%)	178 (29.2%)
Sulfonylureas + Metformin	60 (5.6%)	§	§	§	22 (7.5%)	27 (4.4%)
Sulfonylureas + Metformin + TZD	34 (3.2%)	§	§	§	§	19 (3.1%)
Sulfonylureas + TZD	20 (1.9%)	§	§	§	§	§
Metformin + TZD	23 (2.1%)	§	§	§	§	§
Insulin + any other antidiabetic drug(s)	164 (15.2%)	§	§	11 (9.4%)	40 (13.7%)	108 (17.7%)
All other combinations	12 (1.1%)	§	§	§	§	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	668 (62.1%)	§	19 (48.7%)	76 (65.0%)	174 (59.4%)	389 (63.9%)
ACE inhibitors only	418 (38.9%)	§	12 (30.8%)	42 (35.9%)	113 (38.6%)	246 (40.4%)
Angiotensin Receptor Blocker only (ARB)	191 (17.8%)	§	§	25 (21.4%)	52 (17.7%)	106 (17.4%)
Both ACE inhibitors + ARBs	59 (5.5%)	§	§	§	§	37 (6.1%)
Antihyperlipidemics (AHLI)						
Any AHLI	597 (55.5%)	§	21 (53.8%)	71 (60.7%)	175 (59.7%)	320 (52.5%)
Statins	540 (50.2%)	§	21 (53.8%)	66 (56.4%)	158 (53.9%)	286 (47.0%)
Other lipid lowering drugs ²	57 (5.3%)	§	§	§	17 (5.8%)	34 (5.6%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.3. Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (LIS Sample)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	100,502 (100.0%)	18,366 (18.3%)	18,496 (18.4%)	19,271 (19.2%)	21,352 (21.3%)	23,017 (22.9%)
Antidiabetic drugs						
Any antidiabetic drug	72,005 (71.6%)	12,913 (70.3%)	13,604 (73.6%)	14,169 (73.5%)	15,421 (72.2%)	15,898 (69.1%)
Any oral antidiabetic drug	60,438 (60.1%)	11,855 (64.5%)	11,979 (64.8%)	12,281 (63.7%)	12,808 (60.0%)	11,515 (50.0%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	33,220 (33.1%)	6,054 (33.0%)	6,076 (32.9%)	6,173 (32.0%)	6,942 (32.5%)	7,975 (34.6%)
Sulfonylureas	8,754 (8.7%)	1,929 (10.5%)	1,697 (9.2%)	1,628 (8.4%)	1,763 (8.3%)	1,737 (7.5%)
Metformin	8,411 (8.4%)	2,141 (11.7%)	1,901 (10.3%)	1,774 (9.2%)	1,619 (7.6%)	976 (4.2%)
Thiazolidinediones (TZD)	3,962 (3.9%)	852 (4.6%)	765 (4.1%)	789 (4.1%)	812 (3.8%)	744 (3.2%)
Insulin	11,567 (11.5%)	1,058 (5.8%)	1,625 (8.8%)	1,888 (9.8%)	2,613 (12.2%)	4,383 (19.0%)
All others ¹	526 (0.5%)	74 (0.4%)	88 (0.5%)	94 (0.5%)	135 (0.6%)	135 (0.6%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	38,785 (38.6%)	6,859 (37.3%)	7,528 (40.7%)	7,996 (41.5%)	8,479 (39.7%)	7,923 (34.4%)
Sulfonylureas + Metformin	8,174 (8.1%)	2,173 (11.8%)	1,799 (9.7%)	1,678 (8.7%)	1,568 (7.3%)	956 (4.2%)
Sulfonylureas + Metformin + TZD	5,398 (5.4%)	1,254 (6.8%)	1,280 (6.9%)	1,206 (6.3%)	1,047 (4.9%)	611 (2.7%)
Sulfonylureas + TZD	3,232 (3.2%)	623 (3.4%)	654 (3.5%)	680 (3.5%)	695 (3.3%)	580 (2.5%)
Metformin + TZD	3,605 (3.6%)	891 (4.9%)	834 (4.5%)	808 (4.2%)	684 (3.2%)	388 (1.7%)
Insulin + any other antidiabetic drug(s)	16,197 (16.1%)	1,597 (8.7%)	2,501 (13.5%)	3,128 (16.2%)	3,959 (18.5%)	5,012 (21.8%)
All other combinations	2,179 (2.2%)	321 (1.7%)	460 (2.5%)	496 (2.6%)	526 (2.5%)	376 (1.6%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	64,496 (64.2%)	11,048 (60.2%)	11,994 (64.8%)	12,644 (65.6%)	13,977 (65.5%)	14,833 (64.4%)
ACE inhibitors only	40,627 (40.4%)	7,422 (40.4%)	7,701 (41.6%)	7,684 (39.9%)	8,467 (39.7%)	9,353 (40.6%)
Angiotensin Receptor Blocker only (ARB)	17,483 (17.4%)	2,839 (15.5%)	3,280 (17.7%)	3,788 (19.7%)	4,014 (18.8%)	3,562 (15.5%)
Both ACE inhibitors + ARBs	6,386 (6.4%)	787 (4.3%)	1,013 (5.5%)	1,172 (6.1%)	1,496 (7.0%)	1,918 (8.3%)
Antihyperlipidemics (AHL D)						
Any AHL D	58,661 (58.4%)	9,986 (54.4%)	11,270 (60.9%)	11,919 (61.8%)	12,805 (60.0%)	12,681 (55.1%)
Statins	54,277 (54.0%)	9,301 (50.6%)	10,462 (56.6%)	10,999 (57.1%)	11,794 (55.2%)	11,721 (50.9%)
Other lipid lowering drugs ²	4,384 (4.4%)	685 (3.7%)	808 (4.4%)	920 (4.8%)	1,011 (4.7%)	960 (4.2%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.3.1 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Diabetes only)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	64,284 (100.0%)	15,984 (24.9%)	14,315 (22.3%)	12,839 (20.0%)	11,423 (17.8%)	9,723 (15.1%)
Antidiabetic drugs						
Any antidiabetic drug	47,230 (73.5%)	11,370 (71.1%)	10,769 (75.2%)	9,706 (75.6%)	8,488 (74.3%)	6,897 (70.9%)
Any oral antidiabetic drug	40,303 (62.7%)	10,459 (65.4%)	9,490 (66.3%)	8,437 (65.7%)	7,062 (61.8%)	4,855 (49.9%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	21,675 (33.7%)	5,299 (33.2%)	4,781 (33.4%)	4,175 (32.5%)	3,782 (33.1%)	3,638 (37.4%)
Sulfonylureas	6,006 (9.3%)	1,719 (10.8%)	1,360 (9.5%)	1,137 (8.9%)	979 (8.6%)	811 (8.3%)
Metformin	5,681 (8.8%)	1,849 (11.6%)	1,468 (10.3%)	1,163 (9.1%)	834 (7.3%)	367 (3.8%)
Thiazolidinediones (TZD)	2,721 (4.2%)	759 (4.7%)	602 (4.2%)	542 (4.2%)	461 (4.0%)	357 (3.7%)
Insulin	6,927 (10.8%)	911 (5.7%)	1,279 (8.9%)	1,269 (9.9%)	1,426 (12.5%)	2,042 (21.0%)
All others ¹	340 (0.5%)	61 (0.4%)	72 (0.5%)	64 (0.5%)	82 (0.7%)	61 (0.6%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	25,555 (39.8%)	6,071 (38.0%)	5,988 (41.8%)	5,531 (43.1%)	4,706 (41.2%)	3,259 (33.5%)
Sulfonylureas + Metformin	5,956 (9.3%)	1,954 (12.2%)	1,476 (10.3%)	1,208 (9.4%)	904 (7.9%)	414 (4.3%)
Sulfonylureas + Metformin + TZD	3,952 (6.2%)	1,110 (6.9%)	1,050 (7.3%)	871 (6.8%)	624 (5.5%)	297 (3.1%)
Sulfonylureas + TZD	2,296 (3.6%)	561 (3.5%)	529 (3.7%)	494 (3.8%)	418 (3.7%)	294 (3.0%)
Metformin + TZD	2,499 (3.9%)	787 (4.9%)	657 (4.6%)	541 (4.2%)	367 (3.2%)	147 (1.5%)
Insulin + any other antidiabetic drug(s)	9,399 (14.6%)	1,377 (8.6%)	1,923 (13.4%)	2,059 (16.0%)	2,104 (18.4%)	1,936 (19.9%)
All other combinations	1,453 (2.3%)	282 (1.8%)	353 (2.5%)	358 (2.8%)	289 (2.5%)	171 (1.8%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	42,348 (65.9%)	9,806 (61.3%)	9,556 (66.8%)	8,783 (68.4%)	7,839 (68.6%)	6,364 (65.5%)
ACE inhibitors only	26,336 (41.0%)	6,556 (41.0%)	6,048 (42.2%)	5,210 (40.6%)	4,644 (40.7%)	3,878 (39.9%)
Angiotensin Receptor Blocker only (ARB)	11,901 (18.5%)	2,536 (15.9%)	2,681 (18.7%)	2,712 (21.1%)	2,309 (20.2%)	1,663 (17.1%)
Both ACE inhibitors + ARBs	4,111 (6.4%)	714 (4.5%)	827 (5.8%)	861 (6.7%)	886 (7.8%)	823 (8.5%)
Antihyperlipidemics (AHL D)						
Any AHL D	37,972 (59.1%)	8,751 (54.7%)	8,921 (62.3%)	8,096 (63.1%)	6,847 (59.9%)	5,357 (55.1%)
Statins	35,271 (54.9%)	8,151 (51.0%)	8,286 (57.9%)	7,509 (58.5%)	6,358 (55.7%)	4,967 (51.1%)
Other lipid lowering drugs ²	2,701 (4.2%)	600 (3.8%)	635 (4.4%)	587 (4.6%)	489 (4.3%)	390 (4.0%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

Table 3.3.2 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and no Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	12,319 (100.0%)	622 (5.1%)	1,155 (9.4%)	2,096 (17.0%)	3,719 (30.2%)	4,727 (38.4%)
Antidiabetic drugs						
Any antidiabetic drug	8,333 (67.6%)	347 (55.8%)	719 (62.3%)	1,441 (68.8%)	2,616 (70.3%)	3,210 (67.9%)
Any oral antidiabetic drug	6,779 (55.0%)	318 (51.1%)	632 (54.7%)	1,269 (60.5%)	2,180 (58.6%)	2,380 (50.3%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	4,026 (32.7%)	177 (28.5%)	348 (30.1%)	675 (32.2%)	1,249 (33.6%)	1,577 (33.4%)
Sulfonylureas	1,146 (9.3%)	58 (9.3%)	111 (9.6%)	207 (9.9%)	385 (10.4%)	385 (8.1%)
Metformin	812 (6.6%)	62 (10.0%)	101 (8.7%)	193 (9.2%)	270 (7.3%)	186 (3.9%)
Thiazolidinediones (TZD)	448 (3.6%)	26 (4.2%)	45 (3.9%)	93 (4.4%)	135 (3.6%)	149 (3.2%)
Insulin	1,554 (12.6%)	29 (4.7%)	87 (7.5%)	172 (8.2%)	436 (11.7%)	830 (17.6%)
All others ¹	66 (0.5%)	§	§	§	23 (0.6%)	27 (0.6%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	4,307 (35.0%)	170 (27.3%)	371 (32.1%)	766 (36.5%)	1,367 (36.8%)	1,633 (34.5%)
Sulfonylureas + Metformin	775 (6.3%)	49 (7.9%)	72 (6.2%)	179 (8.5%)	269 (7.2%)	206 (4.4%)
Sulfonylureas + Metformin + TZD	496 (4.0%)	24 (3.9%)	69 (6.0%)	117 (5.6%)	155 (4.2%)	131 (2.8%)
Sulfonylureas + TZD	373 (3.0%)	20 (3.2%)	42 (3.6%)	74 (3.5%)	112 (3.0%)	125 (2.6%)
Metformin + TZD	348 (2.8%)	23 (3.7%)	53 (4.6%)	83 (4.0%)	108 (2.9%)	81 (1.7%)
Insulin + any other antidiabetic drug(s)	2,056 (16.7%)	46 (7.4%)	108 (9.4%)	269 (12.8%)	621 (16.7%)	1,012 (21.4%)
All other combinations	259 (2.1%)	§	27 (2.3%)	44 (2.1%)	102 (2.7%)	78 (1.7%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	7,876 (63.9%)	328 (52.7%)	682 (59.0%)	1,305 (62.3%)	2,428 (65.3%)	3,133 (66.3%)
ACE inhibitors only	4,804 (39%)	209 (33.6%)	435 (37.7%)	786 (37.5%)	1,440 (38.7%)	1,934 (40.9%)
Angiotensin Receptor Blocker only (ARB)	2,167 (17.6%)	103 (16.6%)	181 (15.7%)	402 (19.2%)	713 (19.2%)	768 (16.2%)
Both ACE inhibitors + ARBs	905 (7.4%)	16 (2.6%)	66 (5.7%)	117 (5.6%)	275 (7.4%)	431 (9.1%)
Antihyperlipidemics (AHLI)						
Any AHLI	7,271 (59.0%)	312 (50.2%)	662 (57.3%)	1,263 (60.3%)	2,308 (62.1%)	2,726 (57.7%)
Statins	6,758 (54.9%)	292 (46.9%)	628 (54.4%)	1,181 (56.3%)	2,115 (56.9%)	2,542 (53.8%)
Other lipid lowering drugs ²	513 (4.2%)	20 (3.2%)	34 (2.9%)	82 (3.9%)	193 (5.2%)	184 (3.9%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 3.3.3 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Major Depression and no COPD)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	17,547 (100.0%)	1,661 (9.5%)	2,761 (15.7%)	3,679 (21.0%)	4,572 (26.1%)	4,874 (27.8%)
Antidiabetic drugs						
Any antidiabetic drug	12,200 (69.5%)	1,140 (68.6%)	1,946 (70.5%)	2,570 (69.9%)	3,225 (70.5%)	3,319 (68.1%)
Any oral antidiabetic drug	10,018 (57.1%)	1,030 (62.0%)	1,711 (62.0%)	2,181 (59.3%)	2,668 (58.4%)	2,428 (49.8%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	5,529 (31.5%)	546 (32.9%)	862 (31.2%)	1,122 (30.5%)	1,404 (30.7%)	1,595 (32.7%)
Sulfonylureas	1,190 (6.8%)	140 (8.4%)	206 (7.5%)	236 (6.4%)	289 (6.3%)	319 (6.5%)
Metformin	1,464 (8.3%)	219 (13.2%)	304 (11.0%)	340 (9.2%)	378 (8.3%)	223 (4.6%)
Thiazolidinediones (TZD)	605 (3.5%)	66 (4.0%)	107 (3.9%)	141 (3.8%)	154 (3.4%)	137 (2.8%)
Insulin	2,182 (12.4%)	110 (6.6%)	235 (8.5%)	389 (10.6%)	557 (12.2%)	891 (18.3%)
All others ¹	88 (0.5%)	11 (0.7%)	§	16 (0.4%)	26 (0.6%)	25 (0.5%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	6,671 (38.0%)	594 (35.8%)	1,084 (39.3%)	1,448 (39.4%)	1,821 (39.8%)	1,724 (35.4%)
Sulfonylureas + Metformin	1,146 (6.5%)	163 (9.8%)	233 (8.4%)	245 (6.7%)	301 (6.6%)	204 (4.2%)
Sulfonylureas + Metformin + TZD	781 (4.5%)	118 (7.1%)	153 (5.5%)	192 (5.2%)	211 (4.6%)	107 (2.2%)
Sulfonylureas + TZD	443 (2.5%)	41 (2.5%)	80 (2.9%)	94 (2.6%)	130 (2.8%)	98 (2.0%)
Metformin + TZD	609 (3.5%)	79 (4.8%)	115 (4.2%)	158 (4.3%)	166 (3.6%)	91 (1.9%)
Insulin + any other antidiabetic drug(s)	3,338 (19.0%)	163 (9.8%)	431 (15.6%)	680 (18.5%)	914 (20.0%)	1,150 (23.6%)
All other combinations	354 (2.0%)	30 (1.8%)	72 (2.6%)	79 (2.1%)	99 (2.2%)	74 (1.5%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	10,337 (58.9%)	869 (52.3%)	1,611 (58.3%)	2,165 (58.8%)	2,728 (59.7%)	2,964 (60.8%)
ACE inhibitors only	6,857 (39.1%)	626 (37.7%)	1,121 (40.6%)	1,426 (38.8%)	1,737 (38.0%)	1,947 (39.9%)
Angiotensin Receptor Blocker only (ARB)	2,549 (14.5%)	189 (11.4%)	382 (13.8%)	569 (15.5%)	744 (16.3%)	665 (13.6%)
Both ACE inhibitors + ARBs	931 (5.3%)	54 (3.3%)	108 (3.9%)	170 (4.6%)	247 (5.4%)	352 (7.2%)
Antihyperlipidemics (AHLI)						
Any AHLI	9,877 (56.3%)	876 (52.7%)	1,555 (56.3%)	2,183 (59.3%)	2,679 (58.6%)	2,584 (53.0%)
Statins	8,997 (51.3%)	811 (48.8%)	1,428 (51.7%)	1,962 (53.3%)	2,431 (53.2%)	2,365 (48.5%)
Other lipid lowering drugs ²	880 (5.0%)	65 (3.9%)	127 (4.6%)	221 (6.0%)	248 (5.4%)	219 (4.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10

Table 3.3.4 Prevalence of Use of Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and Major Depression)

Drug Class	Number and Percent with any Drug Use ³					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Total (All sample)	6,352 (100.0%)	99 (1.6%)	265 (4.2%)	657 (10.3%)	1,638 (25.8%)	3,693 (58.1%)
Antidiabetic drugs						
Any antidiabetic drug	4,242 (66.8%)	56 (56.6%)	170 (64.2%)	452 (68.8%)	1,092 (66.7%)	2,472 (66.9%)
Any oral antidiabetic drug	3,338 (52.6%)	48 (48.5%)	146 (55.1%)	394 (60.0%)	898 (54.8%)	1,852 (50.1%)
<i>Antidiabetic drugs (monotherapy)</i>						
Any single class antidiabetic drug use	1,990 (31.3%)	32 (32.3%)	85 (32.1%)	201 (30.6%)	507 (31.0%)	1,165 (31.5%)
Sulfonylureas	412 (6.5%)	12 (12.1%)	20 (7.5%)	48 (7.3%)	110 (6.7%)	222 (6.0%)
Metformin	454 (7.2%)	11 (11.1%)	28 (10.6%)	78 (11.9%)	137 (8.4%)	200 (5.4%)
Thiazolidinediones (TZD)	188 (3.0%)	§	11 (4.2%)	13 (2.0%)	62 (3.8%)	101 (2.7%)
Insulin	904 (14.2%)	§	24 (9.1%)	58 (8.8%)	194 (11.8%)	620 (16.8%)
All others ¹	32 (0.5%)	§	§	§	§	22 (0.6%)
<i>Antidiabetic drugs (multiple therapy)</i>						
Any multiple class antidiabetic drug use	2,252 (35.5%)	24 (24.2%)	85 (32.1%)	251 (38.2%)	585 (35.7%)	1,307 (35.4%)
Sulfonylureas + Metformin	297 (4.7%)	§	18 (6.8%)	46 (7.0%)	94 (5.7%)	132 (3.6%)
Sulfonylureas + Metformin + TZD	169 (2.7%)	§	§	26 (4.0%)	57 (3.5%)	76 (2.1%)
Sulfonylureas + TZD	120 (1.9%)	§	§	18 (2.7%)	35 (2.1%)	63 (1.7%)
Metformin + TZD	149 (2.4%)	§	§	26 (4.0%)	43 (2.6%)	69 (1.9%)
Insulin + any other antidiabetic drug(s)	1,404 (22.1%)	11 (11.1%)	39 (14.7%)	120 (18.3%)	320 (19.5%)	914 (24.7%)
All other combinations	113 (1.8%)	§	§	15 (2.3%)	36 (2.2%)	53 (1.4%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	3,935 (61.9%)	45 (45.5%)	145 (54.7%)	391 (59.5%)	982 (60.0%)	2,372 (64.2%)
ACE inhibitors only	2,630 (41.4%)	31 (31.3%)	97 (36.6%)	262 (39.9%)	646 (39.4%)	1,594 (43.2%)
Angiotensin Receptor Blocker only (ARB)	866 (13.6%)	11 (11.1%)	36 (13.6%)	105 (16.0%)	248 (15.1%)	466 (12.6%)
Both ACE inhibitors + ARBs	439 (6.9%)	§	12 (4.5%)	24 (3.7%)	88 (5.4%)	312 (8.4%)
Antihyperlipidemics (AHL)						
Any AHL	3,541 (55.7%)	47 (47.5%)	132 (49.8%)	377 (57.4%)	971 (59.3%)	2,014 (54.5%)
Statins	3,251 (51.2%)	47 (47.5%)	120 (45.3%)	347 (52.8%)	890 (54.3%)	1,847 (50.0%)
Other lipid lowering drugs ²	290 (4.6%)	§	12 (4.5%)	30 (4.6%)	81 (4.9%)	167 (4.5%)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

³ Quintile population reflect the quintile assignment for the entire study sample (n=151,460) and not the quintile for this subsample.

§ Contents suppressed due to cell size ≤ 10.

Table 4.1. Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Full Sample)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	294.1 (90.4)	300.5 (84.8)	303.5 (82.1)	299.8 (86.1)	292.8 (92.1)	268.7 (104.6)
Any single class antidiabetic drug use	276.6 (101.3)	285.1 (95.6)	285.2 (95.2)	279.3 (99.7)	274.8 (103.0)	248.4 (113.3)
Sulfonylureas	284.5 (96.6)	295.6 (88.1)	297.5 (84.0)	289.3 (93.7)	282.2 (99.0)	252.8 (112.3)
Metformin	270.4 (104.0)	277.1 (100.1)	276.6 (101.0)	272.7 (102.1)	265.7 (106.8)	240.8 (114.2)
Thiazolidinediones (TZD)	275.6 (102.3)	281.9 (98.4)	281.9 (97.9)	275.5 (102.8)	279.7 (100.9)	254.1 (111.3)
All others ¹	254.4 (112.8)	282.3 (92.5)	268.0 (110.6)	255.5 (113.7)	257.3 (111.0)	221.6 (120.2)
Any multiple class antidiabetic drug use	304.8 (81.2)	312.4 (73.3)	315.3 (69.9)	311.8 (74.4)	302.8 (83.8)	278.8 (98.4)
Sulfonylureas + Metformin	314.5 (68.2)	314.5 (69.4)	318.6 (62.2)	316.9 (66.3)	312.8 (70.7)	303.4 (75.5)
Sulfonylureas + Metformin + TZD	328.4 (50.6)	325.5 (55.3)	331.9 (47.2)	329.8 (48.1)	329.1 (48.1)	323.0 (55.1)
Sulfonylureas + TZD	320.7 (61.5)	321.1 (59.0)	325.1 (56.9)	324.8 (58.3)	322.3 (60.5)	306.8 (73.3)
Metformin + TZD	304.8 (80.0)	304.5 (81.8)	307.1 (76.6)	306.1 (80.0)	306.5 (77.9)	293.9 (86.6)
Insulin + any other antidiabetic drug(s)	282.5 (99.1)	294.7 (91.7)	299.6 (87.4)	296.4 (90.0)	282.5 (100.0)	258.7 (108.3)
All other combinations	324.1 (54.4)	325.0 (57.2)	329.3 (45.0)	325.7 (49.4)	322.5 (57.9)	314.9 (64.9)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	284.4 (95.5)	294.8 (87.9)	295.7 (87.1)	292.0 (90.2)	283.4 (96.5)	256.6 (108.2)
ACE inhibitors only	281.6 (98.7)	294.2 (89.1)	295.0 (88.8)	290.6 (92.7)	279.0 (100.8)	249.0 (112.2)
Angiotensin Receptor Blocker only (ARB)	282.6 (95.2)	291.3 (89.9)	291.9 (88.4)	288.4 (91.4)	282.4 (95.2)	255.5 (106.9)
Both ACE inhibitors + ARBs	309.1 (66.9)	314.2 (61.3)	313.6 (63.8)	313.0 (62.5)	311.4 (65.3)	298.4 (74.9)
Antihyperlipidemics (AHL D)						
Any AHL D	274.9 (100.6)	279.2 (98.3)	281.5 (96.0)	279.7 (98.3)	274.9 (101.8)	258.0 (107.3)
Statins	278.2 (97.9)	281.3 (96.4)	284.4 (93.5)	283.2 (95.3)	278.6 (98.6)	262.1 (104.5)
Other lipid lowering drugs ²	237.7 (121.4)	252.6 (116.0)	248.8 (115.5)	241.9 (120.1)	234.1 (124.3)	210.7 (126.2)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.1.1 Duration of Therapy for Drugs Used by Quintile of Medicare Spending in 2006 (Sample with Diabetes only)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	297.8 (86.8)	300.6 (84.5)	303.9 (81.1)	300.9 (84.4)	294.7 (89.7)	275.1 (100.5)
Any single class antidiabetic drug use	280.4 (98.4)	285.3 (95.1)	285.6 (94.5)	280.8 (98.3)	277.2 (100.7)	256.1 (110.2)
Sulfonylureas	289.0 (92.4)	295.8 (87.3)	296.3 (84.7)	291.2 (91.4)	283.8 (96.4)	261.6 (108.3)
Metformin	274.2 (101.7)	277.7 (99.7)	278.3 (99.8)	273.5 (101.2)	270.6 (104.1)	246.9 (112.6)
Thiazolidinediones (TZD)	278.0 (100.4)	280.6 (99.0)	283.0 (96.5)	277.4 (101.9)	278.4 (101.4)	261.2 (106.9)
All others ¹	257.6 (111.2)	279.8 (91.1)	265.0 (112.4)	252.7 (115.9)	262.1 (105.8)	222.8 (123.1)
Any multiple class antidiabetic drug use	315.7 (66.5)	314.6 (69.3)	319.0 (61.0)	318.5 (63.3)	313.2 (70.4)	305.2 (72.9)
Sulfonylureas + Metformin	327.9 (51.3)	324.8 (56.5)	331.5 (47.1)	328.9 (48.9)	328.6 (49.0)	321.9 (55.5)
Sulfonylureas + Metformin + TZD	321.8 (59.8)	321.1 (59.1)	326.2 (54.8)	323.4 (60.3)	322.5 (58.2)	309.5 (70.9)
Sulfonylureas + TZD	307.0 (76.8)	303.9 (82.3)	308.8 (72.9)	308.4 (77.2)	309.5 (71.2)	303.9 (74.8)
Metformin + TZD	287.6 (95.3)	294.7 (91.2)	299.2 (86.9)	295.9 (88.9)	283.5 (98.9)	263.5 (105.5)
Insulin + any other antidiabetic drug(s)	325.4 (52.0)	325.6 (57.2)	329.0 (44.8)	326.0 (49.7)	323.3 (54.2)	318.7 (58.3)
All other combinations						
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	288.4 (92.3)	294.8 (87.6)	295.7 (86.6)	292.5 (89.1)	284.9 (94.6)	260.5 (106.5)
ACE inhibitors only	286.6 (94.7)	294.2 (88.8)	294.9 (88.3)	291.2 (91.3)	281.2 (98.5)	254.9 (109.6)
Angiotensin Receptor Blocker only (ARB)	285.2 (93.4)	291.2 (89.8)	292.3 (87.8)	288.9 (90.8)	282.6 (94.3)	256.1 (107.9)
Both ACE inhibitors + ARBs	310.8 (64.9)	314.7 (59.5)	313.1 (64.1)	313.2 (62.8)	311.6 (64.5)	299.7 (73.3)
Antihyperlipidemics (AHLI)						
Any AHLI	276.6 (99.0)	279.0 (98.0)	281.2 (95.6)	279.4 (97.8)	274.2 (101.1)	260.6 (105.3)
Statins	279.4 (96.7)	281.1 (96.1)	284.1 (93.2)	282.5 (95.0)	277.1 (98.6)	264.1 (102.8)
Other lipid lowering drugs ²	244.0 (118.6)	252.9 (115.4)	249.2 (114.8)	244.3 (119.2)	241.6 (121.6)	218.8 (123.6)

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.1.2 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and no Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	284.2 (99.0)	299.0 (89.3)	299.4 (89.1)	296.9 (89.6)	290.4 (95.2)	264.7 (108.2)
Any single class antidiabetic drug use	266.4 (108.4)	283.0 (99.5)	280.7 (99.7)	278.2 (100.6)	273.3 (105.4)	242.4 (117.2)
Sulfonylureas	269.7 (107.4)	283.4 (101.6)	305.2 (78.5)	284.2 (96.2)	275.6 (105.7)	242.9 (117.4)
Metformin	261.3 (109.8)	272.3 (105.1)	260.1 (111.2)	274.3 (102.3)	266.3 (108.3)	237.4 (117.1)
Thiazolidinediones (TZD)	272.6 (105.3)	311.3 (70.5)	267.9 (106.1)	274.7 (106.6)	284.6 (95.5)	255.6 (114.7)
All others ¹	239.1 (117.8)	§	§	261.8 (106.6)	257.9 (113.9)	206.7 (121.8)
Any multiple class antidiabetic drug use	295.3 (91.0)	312.8 (77.0)	314.1 (76.8)	309.6 (78.9)	301.5 (86.1)	276.0 (101.4)
Sulfonylureas + Metformin	310.9 (72.4)	313.2 (76.3)	316.7 (73.0)	312.6 (73.6)	312.1 (72.4)	305.3 (70.5)
Sulfonylureas + Metformin + TZD	332.2 (45.8)	337.5 (39.4)	334.5 (47.1)	337.6 (33.2)	335.0 (40.1)	321.1 (59.8)
Sulfonylureas + TZD	320.7 (62.8)	325.7 (53.6)	314.1 (78.6)	326.0 (53.0)	329.5 (46.6)	310.8 (74.7)
Metformin + TZD	296.1 (92.0)	320.4 (74.0)	299.7 (88.8)	295.5 (92.2)	299.6 (89.9)	281.6 (100.9)
Insulin + any other antidiabetic drug(s)	270.8 (106.3)	286.3 (102.8)	300.2 (92.5)	292.8 (96.0)	279.0 (101.6)	255.2 (111.2)
All other combinations	316.6 (67.0)	312.7 (52.6)	327.9 (47.4)	323.9 (44.8)	317.4 (73.9)	306.2 (78.3)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	273.9 (102.1)	292.6 (93.2)	293.0 (91.7)	288.6 (92.9)	281.6 (98.3)	254.2 (109.0)
ACE inhibitors only	268.7 (106.7)	295.2 (92.5)	294.3 (92.1)	289.7 (93.1)	276.0 (103.2)	245.0 (114.7)
Angiotensin Receptor Blocker only (ARB)	273.6 (99.7)	284.2 (94.7)	284.6 (97.3)	280.6 (98.4)	282.0 (96.3)	256.5 (103.1)
Both ACE inhibitors + ARBs	303.3 (72.6)	310.3 (92.1)	310.5 (65.2)	312.2 (59.6)	310.8 (66.2)	294.2 (79.3)
Antihyperlipidemics (AHL D)						
Any AHL D	270.9 (103.9)	275.4 (104.2)	279.9 (99.1)	280.0 (98.3)	277.4 (101.1)	257.8 (108.9)
Statins	274.5 (101.3)	279.1 (101.7)	282.6 (96.7)	282.3 (96.7)	282.0 (97.4)	261.3 (106.7)
Other lipid lowering drugs ²	229.2 (122.9)	230.7 (124.4)	239.5 (123.5)	252.4 (112.4)	228.5 (124.0)	215.9 (125.6)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 4.1.3 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Sample with Major Depression and no COPD)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	288.6 (95.4)	299.7 (86.9)	301.2 (86.8)	296.7 (90.8)	290.1 (95.0)	265.7 (105.0)
Any single class antidiabetic drug use	269.2 (105.7)	283.4 (100.4)	281.8 (98.3)	273.5 (104.3)	270.8 (105.7)	243.5 (112.0)
Sulfonylureas	279.3 (100.8)	298.4 (93.4)	300.9 (82.3)	282.8 (102.8)	287.8 (94.8)	247.9 (110.3)
Metformin	261.4 (107.9)	271.1 (104.2)	269.0 (104.7)	269.6 (104.6)	253.8 (111.8)	240.6 (111.3)
Thiazolidinediones (TZD)	269.8 (106.9)	289.3 (98.0)	281.1 (103.3)	267.6 (106.1)	282.5 (101.1)	242.9 (115.1)
All others ¹	253.0 (115.4)	311.3 (97.3)	293.3 (90.7)	261.0 (103.0)	238.5 (124.8)	221.2 (121.0)
Any multiple class antidiabetic drug use	299.0 (87.7)	312.3 (72.4)	312.8 (76.7)	309.5 (79.6)	299.4 (87.8)	275.7 (100.2)
Sulfonylureas + Metformin	311.3 (72.7)	315.1 (65.8)	317.4 (66.6)	309.3 (78.5)	313.2 (67.9)	300.7 (82.6)
Sulfonylureas + Metformin + TZD	329.0 (48.5)	330.9 (40.8)	334.2 (47.2)	328.5 (51.9)	326.0 (48.6)	326.2 (50.8)
Sulfonylureas + TZD	317.6 (65.8)	319.3 (62.0)	320.8 (60.0)	333.5 (47.6)	316.1 (76.3)	301.4 (69.1)
Metformin + TZD	300.7 (86.6)	308.6 (73.4)	297.1 (94.8)	304.4 (82.2)	302.1 (87.9)	289.8 (91.2)
Insulin + any other antidiabetic drug(s)	280.6 (101.5)	294.5 (94.3)	301.7 (89.4)	299.6 (90.5)	281.2 (102.1)	258.7 (108.2)
All other combinations	323.7 (55.6)	322.3 (58.8)	330.7 (46.9)	323.5 (52.2)	323.7 (57.0)	317.4 (63.6)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	278.9 (100.1)	294.8 (90.8)	295.6 (89.7)	290.7 (93.9)	280.3 (100.4)	255.0 (107.7)
ACE inhibitors only	274.9 (104.0)	293.4 (92.3)	295.0 (91.8)	288.5 (97.8)	274.8 (104.9)	247.0 (111.7)
Angiotensin Receptor Blocker only (ARB)	279.5 (97.1)	296.1 (89.1)	291.4 (89.9)	289.7 (90.8)	282.3 (97.3)	255.4 (104.4)
Both ACE inhibitors + ARBs	307.7 (69.7)	307.2 (76.3)	316.3 (61.8)	312.1 (63.9)	312.2 (65.4)	299.6 (76.0)
Antihyperlipidemics (AHL D)						
Any AHL D	273.4 (103.1)	283.3 (99.1)	283.9 (97.6)	280.5 (100.6)	275.1 (103.1)	255.7 (107.8)
Statins	278.2 (99.3)	285.4 (96.9)	286.9 (95.1)	286.4 (95.5)	280.7 (98.5)	260.8 (104.4)
Other lipid lowering drugs ²	225.3 (126.2)	257.1 (120.1)	250.1 (118.1)	226.9 (127.1)	223.3 (127.4)	201.8 (126.3)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.1.4 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	272.9 (105.2)	290.6 (97.5)	311.1 (80.8)	295.2 (93.2)	287.7 (97.8)	257.6 (110.1)
Any single class antidiabetic drug use	254.2 (114.3)	281.5 (100.1)	309.2 (86.4)	271.6 (107.3)	265.8 (110.7)	236.3 (117.8)
Sulfonylureas	258.9 (115.3)	271.2 (116.0)	324.2 (57.2)	282.7 (106.3)	274.0 (111.0)	241.0 (119.1)
Metformin	249.7 (113.9)	293.8 (85.8)	310.7 (89.0)	264.2 (110.3)	256.7 (109.2)	229.2 (118.2)
Thiazolidinediones (TZD)	255.7 (111.8)	§	276.0 (119.8)	266.5 (92.4)	273.4 (109.1)	239.6 (115.5)
All others ¹	251.4 (115.9)	§	§	§	§	239.6 (109.4)
Any multiple class antidiabetic drug use	282.4 (99.0)	298.8 (96.0)	312.4 (76.9)	309.6 (80.5)	299.8 (87.7)	267.0 (105.3)
Sulfonylureas + Metformin	303.0 (80.3)	§	299.0 (86.0)	318.3 (59.8)	308.6 (79.4)	296.4 (83.9)
Sulfonylureas + Metformin + TZD	329.5 (51.3)	§	§	339.0 (43.0)	329.3 (56.1)	326.6 (50.7)
Sulfonylureas + TZD	305.8 (79.0)	§	§	323.2 (56.3)	315.5 (70.4)	291.5 (89.8)
Metformin + TZD	292.8 (89.9)	§	§	291.0 (94.6)	308.1 (75.8)	283.7 (93.5)
Insulin + any other antidiabetic drug(s)	265.4 (108.1)	326.6 (73.1)	305.4 (85.2)	298.3 (94.4)	286.0 (98.8)	251.5 (111.4)
All other combinations	319.6 (57.5)	§	§	333.2 (42.4)	325.5 (42.4)	308.9 (70.1)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	264.9 (107.9)	296.9 (85.1)	312.8 (73.4)	295.0 (92.3)	281.4 (99.7)	249.4 (112.6)
ACE inhibitors only	257.3 (112.5)	292.8 (90.5)	313.1 (76.1)	291.2 (99.4)	277.6 (103.7)	239.3 (116.3)
Angiotensin Receptor Blocker only (ARB)	268.6 (105.0)	303.7 (73.1)	299.1 (74.7)	298.8 (81.8)	282.6 (95.8)	251.3 (113.3)
Both ACE inhibitors + ARBs	303.4 (70.0)	§	350.5 (12.6)	315.3 (54.3)	307.9 (72.0)	299.1 (71.3)
Antihyperlipidemics (AHLI)						
Any AHLI	263.6 (108.3)	278.1 (108.9)	290.4 (92.6)	285.9 (97.6)	273.1 (106.1)	252.5 (110.8)
Statins	268.9 (104.2)	276.7 (109.4)	295.5 (87.7)	290.1 (94.6)	278.3 (101.6)	258.3 (106.8)
Other lipid lowering drugs ²	205.3 (132.5)	§	230.5 (127.7)	236.5 (118.2)	217.6 (135.1)	191.7 (133.0)

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin § Contents suppressed due to cell size ≤ 10.

Table 4.2 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	295.9 (85.9)	304.5 (78.1)	300.9 (81.3)	298.1 (83.9)	292.0 (90.3)	270.7 (100.3)
Any single class antidiabetic drug use	276.7 (98.1)	287.8 (90.3)	280.4 (94.9)	277.8 (96.5)	272.4 (102.2)	247.7 (111.6)
Sulfonylureas	285.3 (93.0)	300.8 (78.8)	291.8 (86.1)	286.9 (90.2)	280.8 (99.0)	252.8 (111.8)
Metformin	273.5 (99.8)	281.6 (95.6)	274.2 (99.4)	275.3 (98.5)	266.3 (103.7)	248.7 (108.5)
Thiazolidinediones (TZD)	265.5 (102.1)	273.1 (98.1)	274.4 (96.6)	262.4 (103.4)	263.9 (106.6)	238.4 (108.9)
All others ¹	256.9 (108.6)	273.3 (92.4)	263.9 (108.3)	264.5 (104.9)	261.9 (104.5)	222.2 (123.6)
Any multiple class antidiabetic drug use	310.0 (72.5)	318.7 (62.5)	316.0 (65.5)	312.1 (70.7)	305.5 (78.2)	285.9 (89.2)
Sulfonylureas + Metformin	319.7 (59.0)	321.1 (57.8)	322.6 (55.2)	321.1 (58.3)	316.4 (63.7)	309.3 (65.0)
Sulfonylureas + Metformin + TZD	331.0 (43.4)	331.7 (41.2)	331.8 (43.1)	331.0 (42.2)	331.3 (45.0)	325.6 (50.6)
Sulfonylureas + TZD	318.8 (60.3)	322.3 (53.4)	322.8 (54.3)	319.1 (63.2)	317.0 (66.2)	305.6 (68.0)
Metformin + TZD	306.5 (75.0)	309.2 (75.5)	306.5 (72.2)	306.2 (76.5)	311.0 (70.4)	290.3 (83.6)
Insulin + any other antidiabetic drug(s)	281.8 (95.2)	297.3 (84.3)	293.3 (88.5)	288.1 (91.1)	278.4 (98.5)	258.8 (103.2)
All other combinations	324.9 (50.2)	332.9 (43.0)	327.2 (44.8)	325.9 (48.0)	319.9 (56.2)	311.8 (63.7)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	285.7 (90.7)	298.9 (79.8)	293.8 (84.4)	288.9 (89.0)	279.3 (94.7)	254.8 (105.2)
ACE inhibitors only	286.0 (91.3)	301.1 (78.0)	295.5 (83.4)	290.5 (88.4)	276.8 (98.4)	250.7 (107.6)
Angiotensin Receptor Blocker only (ARB)	278.9 (94.3)	291.1 (86.6)	286.0 (90.3)	278.7 (95.6)	276.0 (93.4)	249.9 (105.5)
Both ACE inhibitors + ARBs	308.4 (64.9)	311.9 (62.2)	310.1 (63.4)	315.9 (55.1)	306.4 (66.8)	295.2 (76.3)
Antihyperlipidemics (AHL D)						
Any AHL D	271.4 (98.9)	280.3 (94.0)	277.0 (95.0)	273.2 (98.5)	265.8 (102.4)	251.8 (106.2)
Statins	274.6 (96.3)	282.3 (92.1)	280.1 (92.1)	277.0 (95.3)	269.1 (99.7)	255.3 (103.9)
Other lipid lowering drugs ²	240.5 (117.4)	257.8 (110.0)	245.7 (115.5)	238.0 (118.6)	235.9 (120.5)	217.1 (120.9)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.2.1 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Diabetes only)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	299.5 (82.6)	305.2 (77.3)	301.8 (80.2)	300.1 (81.8)	295.1 (87.7)	279.8 (95.5)
Any single class antidiabetic drug use	281.0 (95.0)	288.6 (89.6)	282.2 (93.8)	280.8 (93.9)	275.7 (100.2)	257.7 (107.8)
Sulfonylureas	290.3 (88.7)	301.1 (78.3)	292.6 (85.0)	290.4 (86.9)	285.6 (94.1)	259.0 (111.3)
Metformin	276.8 (97.8)	282.4 (95.3)	276.3 (98.5)	277.2 (96.4)	268.3 (104.0)	263.2 (99.2)
Thiazolidinediones (TZD)	270.7 (99.3)	274.1 (96.9)	278.2 (94.6)	267.0 (100.9)	264.6 (107.3)	252.9 (102.5)
All others ¹	264.1 (105.3)	279.2 (84.9)	262.0 (111.8)	267.2 (103.8)	276.3 (93.7)	231.4 (126.1)
Any multiple class antidiabetic drug use	313.2 (68.9)	319.3 (61.7)	316.2 (64.9)	313.2 (69.4)	308.4 (75.1)	294.1 (83.5)
Sulfonylureas + Metformin	320.5 (58.2)	321.6 (57.1)	322.1 (56.0)	321.7 (57.3)	315.9 (64.5)	314.2 (61.8)
Sulfonylureas + Metformin + TZD	331.2 (43.2)	331.7 (41.3)	331.5 (43.2)	331.4 (42.4)	332.2 (43.4)	324.7 (54.5)
Sulfonylureas + TZD	320.1 (58.4)	322.5 (52.6)	324.5 (52.8)	318.4 (64.3)	318.2 (61.4)	308.1 (67.6)
Metformin + TZD	310.0 (70.6)	310.3 (74.7)	308.0 (69.1)	310.4 (71.3)	316.3 (60.9)	303.4 (71.9)
Insulin + any other antidiabetic drug(s)	286.8 (92.2)	298.3 (83.5)	293.1 (88.0)	287.7 (91.2)	283.5 (96.8)	266.6 (99.6)
All other combinations	326.8 (47.2)	333.2 (43.0)	327.6 (43.6)	327.5 (45.9)	322.0 (51.7)	315.1 (60.3)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	289.8 (87.6)	299.1 (79.8)	294.5 (83.8)	290.9 (87.4)	282.4 (92.7)	261.7 (102.1)
ACE inhibitors only	290.7 (87.5)	301.0 (78.0)	296.1 (82.7)	292.3 (86.3)	280.2 (96.8)	259.5 (103.3)
Angiotensin Receptor Blocker only (ARB)	282.6 (92.2)	291.6 (86.6)	286.9 (89.6)	280.9 (94.7)	279.3 (90.7)	256.6 (105.1)
Both ACE inhibitors + ARBs	310.0 (63.7)	312.5 (61.1)	311.0 (63.6)	317.7 (54.8)	306.2 (67.0)	292.7 (76.1)
Antihyperlipidemics (AHL D)						
Any AHL D	274.5 (97.4)	280.7 (93.7)	278.2 (94.2)	274.8 (97.8)	268.1 (101.9)	257.0 (104.6)
Statins	277.4 (94.8)	282.6 (91.9)	281.3 (91.3)	278.7 (94.4)	270.7 (99.6)	259.9 (102.7)
Other lipid lowering drugs ²	245.5 (116.0)	259.0 (109.4)	247.5 (114.6)	238.4 (119.3)	243.6 (119.0)	226.7 (119.1)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.2.2 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and no Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	280.0 (98.1)	294.8 (89.9)	293.6 (87.2)	288.4 (93.8)	285.9 (95.5)	261.3 (105.6)
Any single class antidiabetic drug use	259.5 (108.6)	277.6 (102.6)	267.1 (100.1)	264.5 (108.2)	266.5 (105.1)	242.1 (115.4)
Sulfonylureas	268.6 (105.9)	273.2 (102.0)	292.7 (87.5)	272.2 (101.2)	271.1 (107.9)	255.4 (112.1)
Metformin	256.4 (109.3)	272.3 (111.4)	246.0 (109.2)	264.7 (111.1)	269.4 (99.7)	231.0 (117.4)
Thiazolidinediones (TZD)	245.3 (112.4)	§	252.1 (102.0)	238.3 (125.2)	259.5 (100.8)	221.4 (119.8)
All others ¹	227.6 (111.7)	§	§	§	227.3 (118.9)	215.2 (117.7)
Any multiple class antidiabetic drug use	295.8 (86.0)	309.1 (75.5)	320.4 (61.6)	306.0 (77.2)	301.6 (83.9)	274.5 (96.2)
Sulfonylureas + Metformin	315.0 (63.8)	317.7 (62.3)	332.1 (43.4)	319.5 (62.5)	318.1 (65.5)	299.3 (69.0)
Sulfonylureas + Metformin + TZD	329.7 (47.4)	§	332.8 (54.9)	329.1 (37.2)	336.8 (37.8)	318.2 (60.5)
Sulfonylureas + TZD	311.8 (67.7)	§	304.7 (68.7)	314.8 (62.9)	320.6 (69.3)	301.2 (69.1)
Metformin + TZD	279.4 (98.9)	306.2 (86.7)	§	284.1 (96.4)	292.5 (94.4)	240.5 (106.1)
Insulin + any other antidiabetic drug(s)	267.7 (103.2)	§	316.8 (65.5)	286.3 (95.3)	270.4 (100.5)	252.7 (108.9)
All other combinations	311.2 (66.0)	§	308.0 (60.3)	321.0 (50.2)	309.5 (79.6)	298.6 (75.5)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	270.4 (99.6)	300.3 (79.3)	290.5 (90.4)	283.6 (94.6)	277.2 (94.0)	246.7 (107.7)
ACE inhibitors only	268.6 (103.1)	305.2 (76.1)	294.9 (91.5)	286.9 (94.8)	275.6 (96.8)	241.2 (111.9)
Angiotensin Receptor Blocker only (ARB)	265.0 (98.9)	290.7 (81.1)	280.9 (94.5)	273.8 (99.5)	271.7 (94.7)	239.4 (103.2)
Both ACE inhibitors + ARBs	301.2 (69.3)	§	298.8 (63.1)	304.8 (54.7)	306.9 (65.0)	296.4 (76.0)
Antihyperlipidemics (AHLI)						
Any AHLI	258.9 (104.0)	274.2 (98.2)	271.2 (96.7)	260.3 (104.2)	265.7 (101.4)	246.0 (107.9)
Statins	262.6 (101.3)	280.4 (93.3)	273.3 (95.5)	261.8 (102.7)	270.0 (98.0)	250.6 (105.0)
Other lipid lowering drugs ²	225.3 (120.8)	217.7 (125.7)	249.5 (107.7)	246.9 (116.3)	225.1 (123.0)	207.4 (123.3)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 4.2.3 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Major Depression and no COPD)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	283.3 (94.1)	292.1 (89.0)	291.1 (91.6)	291.8 (89.3)	285.3 (93.7)	263.2 (100.3)
Any single class antidiabetic drug use	259.8 (106.3)	274.7 (100.7)	261.9 (104.8)	268.9 (102.3)	265.1 (105.9)	236.1 (111.6)
Sulfonylureas	271.7 (102.5)	309.1 (74.0)	274.8 (102.6)	270.9 (104.4)	278.8 (102.1)	250.2 (107.1)
Metformin	258.1 (105.0)	268.6 (98.3)	259.4 (104.3)	272.2 (101.4)	251.1 (106.3)	231.2 (113.4)
Thiazolidinediones (TZD)	238.0 (112.1)	226.0 (128.5)	235.1 (115.5)	253.3 (103.8)	254.3 (114.7)	223.3 (110.6)
All others ¹	245.1 (122.0)	§	§	§	§	§
Any multiple class antidiabetic drug use	299.5 (81.0)	308.5 (72.9)	311.7 (74.6)	308.5 (74.1)	296.8 (84.0)	280.9 (88.3)
Sulfonylureas + Metformin	316.0 (61.0)	311.6 (69.5)	323.6 (48.0)	316.1 (66.2)	320.2 (51.9)	304.9 (70.2)
Sulfonylureas + Metformin + TZD	330.8 (40.9)	333.6 (25.5)	337.4 (32.5)	331.7 (43.5)	321.3 (54.8)	334.1 (28.1)
Sulfonylureas + TZD	311.2 (71.6)	317.2 (73.9)	309.8 (62.8)	326.6 (55.3)	310.1 (87.3)	298.5 (73.0)
Metformin + TZD	285.8 (98.3)	288.6 (88.6)	295.5 (94.6)	280.5 (105.5)	289.9 (104.2)	272.5 (101.5)
Insulin + any other antidiabetic drug(s)	273.7 (95.5)	296.5 (85.8)	289.8 (99.6)	296.1 (80.3)	262.3 (101.0)	256.6 (96.7)
All other combinations	319.4 (57.6)	§	331.3 (54.5)	313.3 (67.9)	315.4 (59.3)	321.3 (49.2)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	270.1 (99.5)	296.4 (80.4)	284.3 (88.9)	276.7 (96.7)	266.2 (104.5)	250.4 (105.5)
ACE inhibitors only	268.6 (101.5)	301.6 (77.3)	286.0 (88.1)	279.7 (97.5)	259.4 (107.8)	244.6 (108.4)
Angiotensin Receptor Blocker only (ARB)	263.2 (101.4)	281.7 (89.7)	275.7 (97.1)	263.1 (100.2)	266.1 (104.5)	246.2 (104.6)
Both ACE inhibitors + ARBs	303.9 (66.1)	294.5 (68.1)	300.5 (60.0)	311.4 (57.0)	311.0 (65.8)	297.0 (73.3)
Antihyperlipidemics (AHL D)						
Any AHL D	260.7 (103.7)	274.5 (98.2)	262.5 (104.9)	271.4 (99.2)	256.3 (105.7)	247.9 (105.8)
Statins	265.2 (100.9)	277.0 (96.3)	266.8 (101.2)	275.5 (96.5)	263.3 (101.5)	251.2 (104.4)
Other lipid lowering drugs ²	217.9 (119.4)	248.0 (114.6)	211.0 (132.9)	229.0 (115.9)	204.2 (121.0)	216.4 (114.7)

Source: CCW 5% file. 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 4.2.4 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	258.4 (109.3)	§	304.4 (73.7)	265.8 (107.0)	273.0 (106.3)	246.3 (112.2)
Any single class antidiabetic drug use	232.3 (117.7)	§	§	229.6 (115.3)	252.8 (116.5)	215.8 (118.6)
Sulfonylureas	229.6 (118.1)	§	§	267.1 (101.4)	241.1 (125.0)	212.0 (116.0)
Metformin	239.6 (120.7)	§	§	§	254.6 (108.6)	225.4 (129.4)
Thiazolidinediones (TZD)	241.5 (106.5)	§	§	§	294.7 (102.6)	222.4 (111.4)
All others ¹	§	§	§	§	§	§
Any multiple class antidiabetic drug use	276.8 (99.4)	§	§	297.6 (89.1)	289.1 (94.9)	266.1 (104.0)
Sulfonylureas + Metformin	307.8 (70.2)	§	§	§	307.5 (79.4)	305.7 (69.6)
Sulfonylureas + Metformin + TZD	322.2 (48.3)	§	§	§	§	330.9 (26.1)
Sulfonylureas + TZD	312.8 (67.2)	§	§	§	§	§
Metformin + TZD	295.3 (63.9)	§	§	§	§	§
Insulin + any other antidiabetic drug(s)	246.9 (114.9)	§	§	258.0 (138.2)	269.3 (109.3)	238.2 (115.3)
All other combinations	307.0 (79.3)	§	§	§	§	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	250.4 (110.5)	§	290.9 (92.8)	277.9 (96.8)	263.6 (103.7)	236.9 (115.2)
ACE inhibitors only	245.9 (113.3)	§	303.3 (81.1)	274.0 (107.9)	268.0 (103.5)	227.7 (116.9)
Angiotensin Receptor Blocker only (ARB)	244.7 (109.2)	§	§	281.7 (90.3)	251.1 (107.6)	234.8 (113.3)
Both ACE inhibitors + ARBs	300.6 (79.8)	§	§	§	§	303.9 (86.2)
Antihyperlipidemics (AHL D)						
Any AHL D	244.8 (107.5)	§	282.4 (93.7)	267.7 (94.5)	248.5 (104.4)	234.9 (111.5)
Statins	248.9 (104.2)	§	282.4 (93.7)	274.7 (91.3)	248.7 (102.3)	240.7 (107.4)
Other lipid lowering drugs ²	205.9 (129.7)	§	§	§	246.9 (125.6)	185.6 (133.2)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10

Table 4.3 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	293.2 (92.6)	297.9 (88.9)	305.1 (82.6)	300.7 (87.3)	293.1 (92.8)	268.0 (106.0)
Any single class antidiabetic drug use	276.5 (103.2)	283.2 (99.2)	288.5 (95.2)	280.2 (101.7)	276.0 (103.4)	248.7 (114.0)
Sulfonylureas	283.9 (98.7)	291.7 (94.3)	301.4 (82.3)	290.9 (96.2)	283.0 (99.0)	252.7 (112.5)
Metformin	268.5 (106.4)	273.9 (103.1)	278.4 (102.1)	271.0 (104.3)	265.5 (108.3)	237.4 (116.4)
Thiazolidinediones (TZD)	280.8 (102.0)	287.2 (98.3)	287.0 (98.5)	282.5 (101.8)	286.2 (97.7)	259.2 (111.6)
All others ¹	252.6 (115.7)	289.6 (92.6)	272.0 (113.2)	247.0 (121.3)	254.9 (114.6)	221.2 (118.7)
Any multiple class antidiabetic drug use	302.4 (84.8)	308.6 (78.9)	314.9 (72.4)	311.7 (76.2)	301.7 (85.7)	276.7 (100.9)
Sulfonylureas + Metformin	311.1 (73.4)	310.0 (76.0)	315.7 (66.9)	314.0 (71.1)	311.0 (74.0)	300.4 (80.2)
Sulfonylureas + Metformin + TZD	327.1 (53.8)	321.7 (62.0)	331.9 (49.3)	329.2 (50.8)	328.2 (49.3)	322.0 (56.7)
Sulfonylureas + TZD	321.9 (62.2)	320.3 (63.1)	326.5 (58.5)	328.2 (54.9)	324.9 (57.3)	307.3 (75.3)
Metformin + TZD	303.9 (82.5)	301.6 (85.3)	307.5 (79.0)	306.1 (81.7)	304.8 (80.6)	295.4 (87.9)
Insulin + any other antidiabetic drug(s)	282.8 (100.3)	293.6 (94.5)	302.1 (86.9)	299.3 (89.4)	283.6 (100.4)	258.7 (109.5)
All other combinations	323.6 (56.8)	318.9 (65.5)	330.9 (45.0)	325.5 (50.4)	323.7 (58.6)	316.1 (65.4)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	283.7 (97.9)	291.9 (93.0)	296.9 (88.8)	293.7 (90.9)	285.1 (97.2)	257.2 (109.1)
ACE inhibitors only	279.3 (102.1)	289.6 (95.7)	294.8 (92.1)	290.7 (95.1)	279.9 (101.7)	248.4 (113.7)
Angiotensin Receptor Blocker only (ARB)	284.7 (95.6)	291.4 (92.3)	296.2 (86.8)	294.3 (88.2)	285.5 (95.9)	257.5 (107.4)
Both ACE inhibitors + ARBs	309.4 (67.8)	315.6 (60.7)	315.7 (63.9)	311.4 (66.0)	313.2 (64.6)	299.2 (74.5)
Antihyperlipidemics (AHLI)						
Any AHLI	276.9 (101.5)	278.4 (101.3)	284.7 (96.5)	283.8 (97.9)	278.9 (101.2)	260.2 (107.7)
Statins	280.2 (98.8)	280.6 (99.4)	287.3 (94.4)	287.0 (95.0)	282.8 (97.8)	264.5 (104.6)
Other lipid lowering drugs ²	235.8 (124.0)	248.1 (121.0)	251.4 (115.5)	244.9 (121.2)	233.1 (126.3)	207.9 (128.5)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.3.1 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Diabetes only)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	296.7 (89.3)	297.5 (89.1)	305.4 (81.6)	301.4 (86.1)	294.5 (90.8)	273.1 (102.6)
Any single class antidiabetic drug use	280.0 (100.8)	282.9 (99.1)	288.3 (95.0)	280.7 (101.7)	278.3 (101.0)	255.3 (111.5)
Sulfonylureas	288.1 (95.1)	291.7 (93.5)	299.2 (84.4)	291.9 (95.0)	282.6 (98.0)	263.0 (106.6)
Metformin	272.1 (104.6)	274.0 (102.9)	279.9 (100.9)	270.5 (104.8)	272.1 (104.3)	236.5 (119.4)
Thiazolidinediones (TZD)	282.5 (100.9)	284.7 (100.2)	286.7 (97.8)	284.0 (102.0)	285.9 (97.4)	264.2 (108.4)
All others ¹	251.8 (115.9)	280.5 (97.2)	268.3 (113.8)	236.5 (127.0)	254.3 (111.6)	216.4 (121.4)
Any multiple class antidiabetic drug use	306.3 (80.5)	308.0 (79.5)	315.4 (70.8)	312.3 (74.3)	302.6 (84.2)	281.7 (96.8)
Sulfonylureas + Metformin	312.2 (71.9)	309.6 (76.6)	316.5 (64.7)	316.1 (67.6)	311.6 (73.8)	298.7 (79.4)
Sulfonylureas + Metformin + TZD	325.9 (55.5)	320.3 (64.1)	331.6 (49.4)	327.5 (52.3)	326.8 (51.5)	320.6 (56.0)
Sulfonylureas + TZD	322.9 (60.8)	320.0 (64.0)	327.4 (56.3)	327.0 (57.0)	325.2 (56.1)	310.1 (72.4)
Metformin + TZD	305.0 (80.5)	299.9 (86.6)	309.4 (75.4)	307.1 (80.8)	305.8 (76.1)	304.2 (77.0)
Insulin + any other antidiabetic drug(s)	287.9 (96.4)	293.2 (94.3)	301.9 (86.2)	299.4 (87.6)	283.5 (99.7)	262.6 (107.1)
All other combinations	324.4 (55.3)	319.1 (66.4)	330.2 (45.9)	324.9 (52.6)	324.1 (55.7)	320.6 (57.2)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	287.4 (95.1)	291.7 (92.8)	296.6 (88.6)	293.7 (90.3)	286.2 (95.6)	260.0 (108.2)
ACE inhibitors only	284.0 (98.8)	289.4 (95.6)	294.0 (92.2)	290.5 (94.6)	281.8 (99.4)	253.0 (112.2)
Angiotensin Receptor Blocker only (ARB)	286.9 (94.2)	290.9 (92.4)	296.7 (86.1)	294.5 (87.5)	284.5 (96.3)	255.8 (109.2)
Both ACE inhibitors + ARBs	311.3 (65.6)	316.1 (58.4)	314.6 (64.4)	310.4 (67.1)	314.0 (63.2)	301.8 (72.3)
Antihyperlipidemics (AHL D)						
Any AHL D	278.0 (100.1)	277.6 (101.3)	283.6 (96.6)	282.8 (97.7)	277.9 (100.5)	262.4 (105.5)
Statins	280.8 (97.9)	279.9 (99.3)	286.2 (94.6)	285.3 (95.4)	280.8 (97.8)	266.2 (102.8)
Other lipid lowering drugs ²	242.6 (120.9)	247.0 (120.7)	250.9 (115.0)	250.2 (118.9)	239.9 (123.6)	214.3 (126.0)

Source: CCW 5% file. 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 4.3.2 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and no Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	285.8 (99.3)	300.8 (89.1)	301.8 (89.9)	300.7 (87.4)	292.1 (95.0)	265.8 (109.0)
Any single class antidiabetic drug use	269.6 (108.1)	285.2 (98.6)	287.7 (99.0)	284.9 (96.0)	276.2 (105.5)	242.6 (118.1)
Sulfonylureas	270.2 (108.2)	288.9 (101.9)	311.8 (72.8)	290.5 (93.1)	277.6 (104.8)	236.9 (119.5)
Metformin	263.4 (110.0)	272.4 (103.9)	267.2 (112.1)	278.8 (97.7)	265.0 (111.9)	240.2 (117.2)
Thiazolidinediones (TZD)	282.4 (101.0)	304.0 (77.6)	276.0 (108.4)	287.7 (96.7)	293.3 (92.4)	267.5 (110.8)
All others ¹	247.4 (122.2)	§	§	§	284.5 (104.8)	201.7 (126.2)
Any multiple class antidiabetic drug use	295.1 (92.6)	314.3 (77.8)	311.8 (81.5)	311.1 (79.6)	301.5 (86.8)	276.5 (102.9)
Sulfonylureas + Metformin	308.9 (76.4)	310.8 (83.2)	305.7 (86.9)	309.2 (78.5)	309.6 (75.1)	308.4 (71.2)
Sulfonylureas + Metformin + TZD	333.1 (45.2)	342.0 (21.8)	335.1 (44.7)	341.0 (31.0)	334.2 (41.1)	321.9 (59.8)
Sulfonylureas + TZD	323.9 (60.8)	328.7 (46.2)	317.9 (82.7)	328.9 (50.2)	333.1 (33.1)	313.8 (76.4)
Metformin + TZD	300.4 (89.7)	327.2 (68.1)	303.8 (84.1)	299.1 (91.1)	301.3 (89.2)	290.7 (98.0)
Insulin + any other antidiabetic drug(s)	271.7 (107.1)	292.0 (102.1)	296.5 (97.3)	295.7 (96.3)	281.2 (101.9)	255.9 (111.8)
All other combinations	318.6 (67.4)	§	336.0 (39.4)	326.0 (40.9)	319.4 (72.7)	308.3 (79.4)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	275.1 (103.0)	289.5 (98.3)	294.1 (92.2)	290.9 (92.1)	283.3 (99.8)	256.6 (109.4)
ACE inhibitors only	268.8 (108.0)	291.0 (98.5)	294.1 (92.4)	290.9 (92.4)	276.1 (105.4)	246.2 (115.6)
Angiotensin Receptor Blocker only (ARB)	277.2 (99.9)	281.8 (99.6)	286.5 (98.9)	284.1 (97.8)	286.6 (96.8)	262.1 (102.5)
Both ACE inhibitors + ARBs	304.0 (73.5)	319.1 (84.2)	314.9 (66.0)	314.7 (61.2)	312.0 (66.6)	293.7 (80.1)
Antihyperlipidemics (AHL D)						
Any AHL D	275.6 (103.5)	276.0 (106.9)	283.8 (99.9)	289.5 (94.0)	281.8 (100.6)	262.0 (109.0)
Statins	279.0 (101.0)	278.5 (105.3)	286.6 (97.0)	291.8 (92.4)	286.5 (96.8)	265.0 (107.0)
Other lipid lowering drugs ²	231.4 (124.2)	239.8 (126.0)	231.8 (135.3)	256.5 (109.9)	230.0 (124.7)	220.6 (126.9)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 4.3.3 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Major Depression and no COPD)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	289.9 (95.7)	301.8 (86.3)	303.9 (85.3)	298.0 (91.2)	291.1 (95.2)	266.4 (106.2)
Any single class antidiabetic drug use	272.1 (105.4)	286.2 (100.3)	287.9 (95.6)	275.0 (105.0)	272.2 (105.6)	246.1 (112.2)
Sulfonylureas	282.0 (100.1)	294.9 (98.8)	308.5 (74.0)	287.4 (102.0)	290.9 (92.2)	247.1 (111.6)
Metformin	262.4 (108.7)	271.9 (106.4)	272.0 (104.8)	268.8 (105.8)	254.4 (113.0)	243.7 (110.7)
Thiazolidinediones (TZD)	278.4 (103.9)	307.6 (79.6)	293.1 (96.8)	271.7 (106.8)	287.2 (98.2)	250.0 (116.3)
All others ¹	255.5 (113.9)	332.7 (52.2)	§	255.3 (106.2)	230.6 (127.1)	234.7 (115.6)
Any multiple class antidiabetic drug use	298.8 (89.1)	313.2 (72.3)	313.1 (77.3)	309.7 (80.9)	300.0 (88.6)	274.6 (102.6)
Sulfonylureas + Metformin	309.7 (76.0)	316.3 (64.6)	315.4 (71.4)	306.7 (82.6)	311.1 (72.0)	299.5 (86.0)
Sulfonylureas + Metformin + TZD	328.5 (50.2)	330.4 (42.9)	333.3 (50.3)	327.8 (53.8)	327.2 (47.1)	323.5 (56.5)
Sulfonylureas + TZD	319.6 (63.8)	320.0 (58.7)	324.7 (58.9)	335.7 (45.1)	317.8 (73.3)	302.4 (68.0)
Metformin + TZD	304.1 (83.5)	314.2 (68.2)	297.6 (95.3)	309.4 (76.0)	304.0 (85.4)	294.4 (88.3)
Insulin + any other antidiabetic drug(s)	281.7 (102.5)	294.1 (96.2)	303.8 (87.5)	300.2 (92.2)	283.8 (102.1)	259.0 (110.0)
All other combinations	325.0 (55.0)	321.5 (61.6)	330.6 (45.0)	326.6 (46.5)	327.0 (56.0)	316.4 (67.0)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	281.3 (100.1)	294.3 (93.8)	298.7 (89.7)	294.7 (92.7)	283.6 (99.1)	256.2 (108.3)
ACE inhibitors only	276.5 (104.6)	290.9 (96.4)	297.4 (92.6)	290.9 (97.8)	278.3 (104.0)	247.6 (112.5)
Angiotensin Receptor Blocker only (ARB)	284.4 (95.3)	301.2 (88.6)	296.3 (87.1)	299.1 (85.3)	286.4 (95.1)	258.0 (104.3)
Both ACE inhibitors + ARBs	308.6 (70.6)	309.8 (78.2)	320.9 (61.8)	312.2 (65.8)	312.5 (65.4)	300.2 (76.7)
Antihyperlipidemics (AHLI)						
Any AHLI	276.9 (102.7)	286.0 (99.3)	290.5 (94.3)	283.1 (100.9)	279.3 (102.0)	257.7 (108.2)
Statins	281.7 (98.6)	288.1 (97.0)	293.1 (92.2)	289.5 (95.0)	284.5 (97.4)	263.3 (104.3)
Other lipid lowering drugs ²	227.5 (128.1)	260.5 (122.7)	261.5 (111.4)	226.4 (130.0)	228.9 (128.9)	197.5 (129.4)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 4.3.4 Duration of Therapy for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and Major Depression)

Drug Class	Annual Duration of Therapy for Drug Users (days, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	275.3 (104.3)	294.3 (98.6)	311.8 (81.8)	299.9 (90.2)	290.2 (96.1)	259.4 (109.7)
Any single class antidiabetic drug use	258.8 (113.1)	281.7 (101.8)	309.0 (87.7)	280.1 (104.0)	268.6 (109.4)	240.9 (117.3)
Sulfonylureas	267.7 (113.1)	264.8 (118.8)	321.1 (59.1)	287.0 (108.2)	284.7 (104.5)	250.4 (118.8)
Metformin	251.1 (113.0)	293.8 (85.8)	308.1 (93.3)	268.8 (107.3)	257.0 (109.7)	229.7 (116.9)
Thiazolidinediones (TZD)	258.5 (112.9)	§	284.0 (121.3)	301.2 (70.9)	270.3 (110.5)	242.0 (116.4)
All others ¹	263.8 (108.8)	§	§	§	§	243.0 (107.7)
Any multiple class antidiabetic drug use	283.1 (98.9)	306.9 (95.7)	313.9 (77.7)	311.1 (79.3)	301.4 (86.6)	267.1 (105.5)
Sulfonylureas + Metformin	302.0 (82.2)	§	293.9 (91.0)	317.7 (62.7)	308.9 (79.9)	294.4 (86.6)
Sulfonylureas + Metformin + TZD	331.0 (51.9)	§	§	345.1 (36.4)	331.7 (52.5)	325.6 (55.2)
Sulfonylureas + TZD	304.6 (81.0)	§	§	318.7 (62.7)	321.6 (63.1)	288.4 (93.3)
Metformin + TZD	292.4 (93.4)	§	§	289.2 (101.6)	309.0 (77.6)	283.2 (96.2)
Insulin + any other antidiabetic drug(s)	267.5 (107.1)	345.1 (36.8)	310.1 (83.7)	302.0 (89.2)	288.0 (97.5)	253.0 (110.9)
All other combinations	321.0 (55.0)	§	§	334.7 (43.4)	323.4 (43.5)	312.3 (66.0)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	267.3 (107.3)	304.7 (81.2)	315.7 (70.3)	298.4 (91.2)	284.6 (98.7)	251.4 (112.1)
ACE inhibitors only	259.1 (112.3)	296.2 (90.3)	314.4 (75.8)	294.0 (97.9)	279.3 (103.8)	241.1 (116.1)
Angiotensin Receptor Blocker only (ARB)	273.8 (103.4)	337.3 (21.6)	307.1 (63.6)	302.8 (79.5)	289.2 (92.0)	255.1 (113.1)
Both ACE inhibitors + ARBs	303.8 (68.7)	§	352.3 (9.6)	326.5 (49.2)	310.7 (70.6)	298.5 (69.4)
Antihyperlipidemics (AHL D)						
Any AHL D	266.8 (108.1)	282.9 (108.0)	291.6 (92.7)	289.3 (97.9)	277.5 (105.9)	255.3 (110.5)
Statins	272.2 (103.9)	282.9 (108.0)	297.7 (86.8)	293.0 (95.0)	283.5 (100.6)	261.0 (106.5)
Other lipid lowering drugs ²	205.2 (133.3)	§	230.5 (127.7)	246.8 (119.9)	211.4 (136.9)	192.9 (133.3)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 5.1 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Full Sample)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.16)	0.88 (0.16)	0.88 (0.15)	0.88 (0.15)	0.88 (0.16)	0.86 (0.16)
Any single class antidiabetic drug use	0.89 (0.16)	0.89 (0.16)	0.90 (0.16)	0.89 (0.16)	0.88 (0.17)	0.87 (0.17)
Sulfonylureas	0.89 (0.16)	0.90 (0.16)	0.90 (0.15)	0.91 (0.15)	0.89 (0.16)	0.87 (0.17)
Metformin	0.88 (0.17)	0.88 (0.17)	0.89 (0.16)	0.88 (0.17)	0.87 (0.17)	0.86 (0.18)
Thiazolidinediones (TZD)	0.89 (0.15)	0.90 (0.15)	0.89 (0.15)	0.89 (0.16)	0.89 (0.15)	0.88 (0.16)
All others ¹	0.83 (0.20)	0.82 (0.21)	0.85 (0.20)	0.85 (0.19)	0.82 (0.22)	0.83 (0.20)
Any multiple class antidiabetic drug use	0.87 (0.15)	0.87 (0.16)	0.88 (0.15)	0.88 (0.15)	0.88 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.88 (0.15)	0.88 (0.16)	0.88 (0.15)	0.88 (0.15)	0.87 (0.15)	0.85 (0.15)
Sulfonylureas + Metformin + TZD	0.86 (0.15)	0.86 (0.15)	0.87 (0.15)	0.87 (0.14)	0.86 (0.14)	0.84 (0.15)
Sulfonylureas + TZD	0.88 (0.14)	0.89 (0.14)	0.89 (0.14)	0.89 (0.14)	0.89 (0.13)	0.86 (0.14)
Metformin + TZD	0.87 (0.16)	0.86 (0.17)	0.87 (0.16)	0.88 (0.15)	0.87 (0.15)	0.86 (0.16)
Insulin + any other antidiabetic drug(s)	0.88 (0.16)	0.87 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
All other combinations	0.86 (0.14)	0.85 (0.16)	0.86 (0.14)	0.86 (0.14)	0.86 (0.14)	0.85 (0.14)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.90 (0.15)	0.90 (0.15)	0.91 (0.14)	0.90 (0.15)	0.89 (0.15)	0.87 (0.16)
ACE inhibitors only	0.90 (0.15)	0.91 (0.15)	0.91 (0.14)	0.91 (0.14)	0.90 (0.15)	0.88 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.15)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.16)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.88 (0.14)	0.89 (0.14)	0.89 (0.15)	0.89 (0.15)	0.87 (0.15)
Antihyperlipidemics (AHL D)						
Any AHL D	0.88 (0.17)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.17)	0.86 (0.17)
Statins	0.88 (0.16)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Other lipid lowering drugs ²	0.87 (0.18)	0.88 (0.17)	0.89 (0.16)	0.88 (0.17)	0.87 (0.18)	0.85 (0.19)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.1.1 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Sample with Diabetes only)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.16)	0.88 (0.16)	0.88 (0.15)	0.88 (0.15)	0.88 (0.16)	0.86 (0.16)
Any single class antidiabetic drug use	0.89 (0.16)	0.89 (0.16)	0.90 (0.16)	0.89 (0.16)	0.89 (0.17)	0.87 (0.17)
Sulfonylureas	0.90 (0.16)	0.90 (0.16)	0.90 (0.16)	0.91 (0.15)	0.89 (0.16)	0.87 (0.17)
Metformin	0.89 (0.17)	0.89 (0.17)	0.89 (0.16)	0.88 (0.17)	0.88 (0.17)	0.87 (0.17)
Thiazolidinediones (TZD)	0.89 (0.15)	0.90 (0.15)	0.89 (0.15)	0.89 (0.16)	0.89 (0.15)	0.88 (0.16)
All others ¹	0.83 (0.21)	0.81 (0.21)	0.86 (0.19)	0.84 (0.19)	0.81 (0.22)	0.83 (0.21)
Any multiple class antidiabetic drug use	0.87 (0.15)	0.87 (0.16)	0.88 (0.15)	0.88 (0.15)	0.87 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.88 (0.15)	0.88 (0.16)	0.88 (0.15)	0.88 (0.15)	0.87 (0.15)	0.86 (0.15)
Sulfonylureas + Metformin + TZD	0.87 (0.15)	0.86 (0.15)	0.87 (0.15)	0.87 (0.14)	0.86 (0.14)	0.83 (0.15)
Sulfonylureas + TZD	0.89 (0.14)	0.89 (0.14)	0.88 (0.14)	0.89 (0.14)	0.89 (0.13)	0.87 (0.14)
Metformin + TZD	0.87 (0.16)	0.86 (0.17)	0.87 (0.16)	0.88 (0.14)	0.88 (0.15)	0.86 (0.15)
Insulin + any other antidiabetic drug(s)	0.87 (0.16)	0.87 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
All other combinations	0.86 (0.14)	0.85 (0.16)	0.87 (0.14)	0.87 (0.14)	0.85 (0.14)	0.85 (0.13)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.90 (0.15)	0.90 (0.15)	0.91 (0.14)	0.91 (0.15)	0.90 (0.15)	0.88 (0.16)
ACE inhibitors only	0.90 (0.15)	0.91 (0.15)	0.91 (0.14)	0.91 (0.14)	0.90 (0.15)	0.88 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.88 (0.16)
Both ACE inhibitors + ARBs	0.89 (0.14)	0.88 (0.14)	0.89 (0.14)	0.90 (0.14)	0.89 (0.14)	0.87 (0.15)
Antihyperlipidemics (AHLI)						
Any AHLI	0.88 (0.17)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.87 (0.17)	0.86 (0.17)
Statins	0.88 (0.17)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.87 (0.17)	0.86 (0.16)
Other lipid lowering drugs ²	0.88 (0.17)	0.88 (0.17)	0.89 (0.17)	0.88 (0.17)	0.87 (0.18)	0.85 (0.19)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.1.2 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and no Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.16)	0.89 (0.15)	0.89 (0.16)	0.89 (0.16)	0.88 (0.16)	0.87 (0.16)
Any single class antidiabetic drug use	0.88 (0.17)	0.90 (0.15)	0.90 (0.15)	0.89 (0.17)	0.88 (0.17)	0.87 (0.17)
Sulfonylureas	0.89 (0.16)	0.93 (0.12)	0.91 (0.14)	0.90 (0.17)	0.88 (0.17)	0.88 (0.17)
Metformin	0.88 (0.17)	0.87 (0.16)	0.89 (0.17)	0.89 (0.16)	0.88 (0.17)	0.85 (0.18)
Thiazolidinediones (TZD)	0.89 (0.17)	0.90 (0.15)	0.91 (0.15)	0.88 (0.18)	0.90 (0.16)	0.87 (0.17)
All others ¹	0.84 (0.21)	§	§	0.86 (0.21)	0.82 (0.23)	0.84 (0.18)
Any multiple class antidiabetic drug use	0.87 (0.15)	0.89 (0.15)	0.87 (0.16)	0.89 (0.15)	0.88 (0.15)	0.86 (0.15)
Sulfonylureas + Metformin	0.87 (0.15)	0.91 (0.10)	0.89 (0.14)	0.89 (0.14)	0.86 (0.16)	0.86 (0.15)
Sulfonylureas + Metformin + TZD	0.86 (0.14)	0.87 (0.16)	0.85 (0.16)	0.87 (0.14)	0.88 (0.13)	0.85 (0.15)
Sulfonylureas + TZD	0.87 (0.14)	0.84 (0.19)	0.89 (0.14)	0.89 (0.15)	0.87 (0.14)	0.86 (0.13)
Metformin + TZD	0.87 (0.16)	0.87 (0.13)	0.89 (0.16)	0.88 (0.16)	0.87 (0.15)	0.87 (0.17)
Insulin + any other antidiabetic drug(s)	0.88 (0.16)	0.90 (0.17)	0.88 (0.17)	0.90 (0.15)	0.88 (0.16)	0.87 (0.16)
All other combinations	0.86 (0.14)	0.86 (0.12)	0.82 (0.15)	0.85 (0.14)	0.89 (0.12)	0.86 (0.15)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.16)	0.91 (0.15)	0.91 (0.15)	0.90 (0.15)	0.90 (0.15)	0.88 (0.16)
ACE inhibitors only	0.90 (0.15)	0.91 (0.15)	0.92 (0.13)	0.90 (0.15)	0.90 (0.15)	0.88 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.88 (0.16)	0.89 (0.16)	0.89 (0.17)	0.90 (0.15)	0.89 (0.15)	0.86 (0.17)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.94 (0.08)	0.87 (0.15)	0.88 (0.17)	0.89 (0.15)	0.87 (0.15)
Antihyperlipidemics (AHL D)						
Any AHL D	0.87 (0.16)	0.89 (0.16)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.17)
Statins	0.87 (0.16)	0.89 (0.15)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Other lipid lowering drugs ²	0.86 (0.19)	0.88 (0.21)	0.88 (0.18)	0.86 (0.18)	0.86 (0.18)	0.86 (0.19)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10.

Table 5.1.3 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Sample with Major Depression and no COPD)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.16)	0.87 (0.16)	0.89 (0.16)	0.89 (0.15)	0.88 (0.16)	0.86 (0.16)
Any single class antidiabetic drug use	0.88 (0.17)	0.88 (0.16)	0.89 (0.17)	0.89 (0.16)	0.87 (0.17)	0.87 (0.17)
Sulfonylureas	0.90 (0.15)	0.91 (0.15)	0.92 (0.14)	0.92 (0.13)	0.89 (0.15)	0.86 (0.17)
Metformin	0.86 (0.18)	0.86 (0.18)	0.88 (0.18)	0.88 (0.18)	0.85 (0.18)	0.85 (0.18)
Thiazolidinediones (TZD)	0.90 (0.15)	0.92 (0.14)	0.90 (0.15)	0.90 (0.14)	0.89 (0.16)	0.89 (0.15)
All others ¹	0.84 (0.21)	0.92 (0.11)	0.76 (0.28)	0.83 (0.22)	0.84 (0.20)	0.86 (0.22)
Any multiple class antidiabetic drug use	0.87 (0.15)	0.87 (0.16)	0.88 (0.15)	0.88 (0.15)	0.88 (0.15)	0.86 (0.15)
Sulfonylureas + Metformin	0.87 (0.16)	0.86 (0.18)	0.89 (0.15)	0.88 (0.16)	0.87 (0.15)	0.84 (0.17)
Sulfonylureas + Metformin + TZD	0.85 (0.15)	0.85 (0.16)	0.85 (0.15)	0.86 (0.14)	0.85 (0.15)	0.84 (0.13)
Sulfonylureas + TZD	0.89 (0.13)	0.88 (0.11)	0.90 (0.14)	0.90 (0.13)	0.90 (0.13)	0.86 (0.14)
Metformin + TZD	0.87 (0.16)	0.85 (0.18)	0.89 (0.16)	0.88 (0.15)	0.87 (0.17)	0.86 (0.16)
Insulin + any other antidiabetic drug(s)	0.88 (0.15)	0.88 (0.16)	0.89 (0.16)	0.89 (0.15)	0.89 (0.15)	0.87 (0.16)
All other combinations	0.85 (0.15)	0.85 (0.15)	0.85 (0.17)	0.84 (0.16)	0.87 (0.13)	0.84 (0.15)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.15)	0.90 (0.15)	0.91 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.16)
ACE inhibitors only	0.90 (0.15)	0.91 (0.15)	0.91 (0.15)	0.91 (0.14)	0.90 (0.16)	0.87 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.89 (0.15)	0.89 (0.15)	0.87 (0.16)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.90 (0.12)	0.90 (0.14)	0.88 (0.15)	0.88 (0.16)	0.86 (0.15)
Antihyperlipidemics (AHL D)						
Any AHL D	0.88 (0.16)	0.88 (0.17)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Statins	0.88 (0.16)	0.88 (0.17)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.87 (0.16)
Other lipid lowering drugs ²	0.88 (0.18)	0.91 (0.13)	0.89 (0.16)	0.87 (0.18)	0.89 (0.17)	0.85 (0.20)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.1.4 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Sample with COPD and Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.87 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.17)	0.88 (0.15)	0.86 (0.17)
Any single class antidiabetic drug use	0.88 (0.17)	0.89 (0.15)	0.91 (0.14)	0.91 (0.15)	0.88 (0.16)	0.86 (0.18)
Sulfonylureas	0.88 (0.17)	0.85 (0.19)	0.91 (0.14)	0.93 (0.14)	0.89 (0.16)	0.86 (0.18)
Metformin	0.87 (0.17)	0.93 (0.08)	0.92 (0.11)	0.90 (0.16)	0.86 (0.18)	0.86 (0.18)
Thiazolidinediones (TZD)	0.89 (0.15)	§	0.92 (0.16)	0.90 (0.18)	0.91 (0.12)	0.88 (0.15)
All others ¹	0.83 (0.18)	§	§	§	§	0.82 (0.17)
Any multiple class antidiabetic drug use	0.87 (0.16)	0.91 (0.15)	0.88 (0.16)	0.88 (0.17)	0.88 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.86 (0.15)	§	0.84 (0.16)	0.86 (0.19)	0.88 (0.14)	0.84 (0.16)
Sulfonylureas + Metformin + TZD	0.86 (0.15)	§	§	0.91 (0.13)	0.88 (0.13)	0.84 (0.17)
Sulfonylureas + TZD	0.86 (0.16)	§	§	0.89 (0.17)	0.87 (0.16)	0.84 (0.15)
Metformin + TZD	0.86 (0.17)	§	§	0.88 (0.18)	0.87 (0.15)	0.83 (0.18)
Insulin + any other antidiabetic drug(s)	0.87 (0.16)	0.96 (0.09)	0.90 (0.16)	0.89 (0.18)	0.88 (0.16)	0.86 (0.16)
All other combinations	0.84 (0.15)	§	§	0.82 (0.16)	0.86 (0.13)	0.83 (0.16)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.88 (0.16)	0.92 (0.12)	0.92 (0.14)	0.90 (0.15)	0.89 (0.16)	0.87 (0.17)
ACE inhibitors only	0.88 (0.16)	0.94 (0.12)	0.91 (0.15)	0.90 (0.16)	0.89 (0.16)	0.87 (0.17)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.15)	0.87 (0.12)	0.93 (0.10)	0.91 (0.13)	0.89 (0.16)	0.88 (0.16)
Both ACE inhibitors + ARBs	0.85 (0.16)	§	0.92 (0.13)	0.87 (0.19)	0.86 (0.17)	0.84 (0.16)
Antihyperlipidemics (AHL D)						
Any AHL D	0.87 (0.17)	0.90 (0.15)	0.90 (0.15)	0.88 (0.16)	0.88 (0.16)	0.86 (0.17)
Statins	0.87 (0.17)	0.91 (0.15)	0.90 (0.15)	0.88 (0.16)	0.88 (0.17)	0.86 (0.17)
Other lipid lowering drugs ²	0.87 (0.18)	§	0.91 (0.12)	0.86 (0.17)	0.90 (0.14)	0.85 (0.20)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10

Table 5.2 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.89 (0.15)	0.90 (0.15)	0.90 (0.14)	0.89 (0.14)	0.89 (0.15)	0.87 (0.15)
Any single class antidiabetic drug use	0.90 (0.15)	0.91 (0.15)	0.90 (0.15)	0.90 (0.16)	0.89 (0.16)	0.88 (0.16)
Sulfonylureas	0.90 (0.15)	0.91 (0.15)	0.90 (0.15)	0.91 (0.15)	0.89 (0.16)	0.89 (0.15)
Metformin	0.90 (0.15)	0.91 (0.15)	0.90 (0.14)	0.90 (0.16)	0.90 (0.16)	0.87 (0.16)
Thiazolidinediones (TZD)	0.90 (0.15)	0.91 (0.14)	0.90 (0.15)	0.88 (0.16)	0.90 (0.15)	0.88 (0.15)
All others ¹	0.83 (0.20)	0.81 (0.20)	0.82 (0.21)	0.85 (0.19)	0.81 (0.22)	0.83 (0.21)
Any multiple class antidiabetic drug use	0.89 (0.14)	0.89 (0.14)	0.89 (0.13)	0.89 (0.13)	0.88 (0.14)	0.87 (0.14)
Sulfonylureas + Metformin	0.89 (0.14)	0.90 (0.14)	0.90 (0.13)	0.90 (0.13)	0.88 (0.14)	0.86 (0.15)
Sulfonylureas + Metformin + TZD	0.89 (0.12)	0.89 (0.12)	0.89 (0.12)	0.89 (0.12)	0.88 (0.12)	0.86 (0.12)
Sulfonylureas + TZD	0.89 (0.13)	0.90 (0.13)	0.89 (0.12)	0.89 (0.13)	0.89 (0.12)	0.87 (0.12)
Metformin + TZD	0.89 (0.14)	0.88 (0.15)	0.89 (0.14)	0.89 (0.13)	0.90 (0.12)	0.87 (0.15)
Insulin + any other antidiabetic drug(s)	0.88 (0.15)	0.89 (0.16)	0.89 (0.15)	0.88 (0.15)	0.88 (0.15)	0.88 (0.15)
All other combinations	0.87 (0.13)	0.86 (0.14)	0.88 (0.12)	0.87 (0.13)	0.85 (0.13)	0.87 (0.12)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.91 (0.14)	0.92 (0.14)	0.92 (0.14)	0.91 (0.14)	0.90 (0.15)	0.89 (0.15)
ACE inhibitors only	0.92 (0.14)	0.93 (0.13)	0.92 (0.13)	0.92 (0.14)	0.91 (0.14)	0.89 (0.15)
Angiotensin Receptor Blocker only (ARB)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.16)
Both ACE inhibitors + ARBs	0.90 (0.13)	0.90 (0.14)	0.90 (0.13)	0.91 (0.13)	0.89 (0.13)	0.88 (0.14)
Antihyperlipidemics (AHL)						
Any AHL	0.88 (0.16)	0.88 (0.16)	0.89 (0.16)	0.88 (0.16)	0.88 (0.17)	0.87 (0.16)
Statins	0.88 (0.16)	0.88 (0.16)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.87 (0.16)
Other lipid lowering drugs ²	0.88 (0.17)	0.89 (0.16)	0.89 (0.17)	0.88 (0.17)	0.87 (0.17)	0.86 (0.17)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.2.1 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Diabetes only)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.89 (0.14)	0.90 (0.15)	0.90 (0.14)	0.89 (0.14)	0.89 (0.15)	0.88 (0.14)
Any single class antidiabetic drug use	0.90 (0.15)	0.91 (0.15)	0.90 (0.15)	0.90 (0.16)	0.90 (0.16)	0.89 (0.15)
Sulfonylureas	0.91 (0.15)	0.91 (0.15)	0.91 (0.15)	0.91 (0.15)	0.89 (0.17)	0.90 (0.14)
Metformin	0.90 (0.15)	0.91 (0.15)	0.91 (0.14)	0.90 (0.16)	0.90 (0.15)	0.87 (0.16)
Thiazolidinediones (TZD)	0.90 (0.15)	0.91 (0.14)	0.90 (0.15)	0.88 (0.17)	0.91 (0.14)	0.89 (0.15)
All others ¹	0.82 (0.20)	0.80 (0.20)	0.83 (0.21)	0.84 (0.19)	0.82 (0.22)	0.83 (0.22)
Any multiple class antidiabetic drug use	0.89 (0.14)	0.89 (0.14)	0.89 (0.13)	0.89 (0.13)	0.88 (0.14)	0.87 (0.14)
Sulfonylureas + Metformin	0.89 (0.14)	0.90 (0.14)	0.90 (0.13)	0.90 (0.13)	0.88 (0.14)	0.87 (0.14)
Sulfonylureas + Metformin + TZD	0.89 (0.12)	0.89 (0.12)	0.90 (0.12)	0.89 (0.12)	0.88 (0.12)	0.86 (0.12)
Sulfonylureas + TZD	0.89 (0.12)	0.89 (0.13)	0.89 (0.12)	0.89 (0.13)	0.89 (0.12)	0.88 (0.12)
Metformin + TZD	0.89 (0.14)	0.88 (0.15)	0.89 (0.14)	0.89 (0.13)	0.90 (0.12)	0.88 (0.13)
Insulin + any other antidiabetic drug(s)	0.88 (0.15)	0.89 (0.16)	0.89 (0.15)	0.88 (0.15)	0.88 (0.15)	0.88 (0.15)
All other combinations	0.87 (0.13)	0.86 (0.14)	0.89 (0.11)	0.87 (0.12)	0.85 (0.13)	0.88 (0.11)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.91 (0.14)	0.92 (0.13)	0.92 (0.13)	0.91 (0.14)	0.90 (0.15)	0.89 (0.15)
ACE inhibitors only	0.92 (0.13)	0.93 (0.13)	0.92 (0.13)	0.92 (0.13)	0.91 (0.14)	0.90 (0.15)
Angiotensin Receptor Blocker only (ARB)	0.90 (0.15)	0.91 (0.14)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.88 (0.15)
Both ACE inhibitors + ARBs	0.90 (0.13)	0.89 (0.14)	0.90 (0.13)	0.91 (0.12)	0.90 (0.13)	0.88 (0.14)
Antihyperlipidemics (AHL D)						
Any AHL D	0.88 (0.16)	0.88 (0.16)	0.89 (0.16)	0.88 (0.16)	0.88 (0.17)	0.87 (0.16)
Statins	0.88 (0.16)	0.88 (0.17)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.87 (0.16)
Other lipid lowering drugs ²	0.88 (0.16)	0.89 (0.16)	0.89 (0.16)	0.88 (0.17)	0.88 (0.17)	0.86 (0.17)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.2.2 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and no Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.89 (0.15)	0.91 (0.14)	0.89 (0.14)	0.90 (0.14)	0.88 (0.16)	0.88 (0.15)
Any single class antidiabetic drug use	0.89 (0.16)	0.92 (0.13)	0.90 (0.15)	0.92 (0.15)	0.89 (0.17)	0.88 (0.16)
Sulfonylureas	0.90 (0.15)	0.93 (0.13)	0.89 (0.15)	0.93 (0.15)	0.89 (0.16)	0.89 (0.15)
Metformin	0.89 (0.16)	0.90 (0.14)	0.91 (0.14)	0.91 (0.14)	0.89 (0.17)	0.86 (0.18)
Thiazolidinediones (TZD)	0.89 (0.16)	§	0.90 (0.15)	0.90 (0.18)	0.88 (0.17)	0.88 (0.15)
All others ¹	0.85 (0.20)	§	§	§	0.83 (0.23)	0.82 (0.20)
Any multiple class antidiabetic drug use	0.88 (0.14)	0.90 (0.14)	0.88 (0.13)	0.89 (0.14)	0.88 (0.15)	0.88 (0.14)
Sulfonylureas + Metformin	0.89 (0.14)	0.92 (0.12)	0.91 (0.11)	0.91 (0.12)	0.88 (0.15)	0.85 (0.15)
Sulfonylureas + Metformin + TZD	0.88 (0.12)	§	0.89 (0.11)	0.87 (0.14)	0.87 (0.12)	0.88 (0.12)
Sulfonylureas + TZD	0.87 (0.13)	§	0.86 (0.12)	0.85 (0.17)	0.87 (0.12)	0.87 (0.12)
Metformin + TZD	0.88 (0.15)	0.86 (0.15)	§	0.89 (0.15)	0.86 (0.15)	0.85 (0.19)
Insulin + any other antidiabetic drug(s)	0.88 (0.15)	§	0.87 (0.16)	0.90 (0.14)	0.87 (0.17)	0.89 (0.14)
All other combinations	0.87 (0.14)	§	0.78 (0.14)	0.86 (0.15)	0.91 (0.11)	0.90 (0.11)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.90 (0.15)	0.91 (0.15)	0.91 (0.13)	0.91 (0.14)	0.89 (0.15)	0.88 (0.16)
ACE inhibitors only	0.90 (0.15)	0.91 (0.16)	0.93 (0.11)	0.91 (0.15)	0.90 (0.15)	0.89 (0.15)
Angiotensin Receptor Blocker only (ARB)	0.88 (0.16)	0.89 (0.15)	0.89 (0.16)	0.91 (0.13)	0.88 (0.16)	0.86 (0.18)
Both ACE inhibitors + ARBs	0.88 (0.14)	§	0.88 (0.15)	0.89 (0.17)	0.88 (0.14)	0.87 (0.13)
Antihyperlipidemics (AHL D)						
Any AHL D	0.87 (0.16)	0.87 (0.17)	0.88 (0.16)	0.87 (0.18)	0.87 (0.17)	0.87 (0.16)
Statins	0.87 (0.16)	0.88 (0.16)	0.88 (0.16)	0.88 (0.17)	0.87 (0.16)	0.87 (0.16)
Other lipid lowering drugs ²	0.87 (0.18)	0.80 (0.27)	0.87 (0.21)	0.86 (0.20)	0.86 (0.18)	0.89 (0.15)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10

Table 5.2.3 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with Major Depression and no COPD)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.15)	0.89 (0.16)	0.89 (0.14)	0.89 (0.14)	0.88 (0.15)	0.86 (0.16)
Any single class antidiabetic drug use	0.88 (0.16)	0.89 (0.16)	0.89 (0.15)	0.89 (0.16)	0.88 (0.17)	0.87 (0.16)
Sulfonylureas	0.89 (0.16)	0.90 (0.17)	0.90 (0.17)	0.93 (0.12)	0.89 (0.16)	0.86 (0.16)
Metformin	0.88 (0.16)	0.87 (0.16)	0.89 (0.14)	0.88 (0.17)	0.88 (0.17)	0.86 (0.16)
Thiazolidinediones (TZD)	0.89 (0.16)	0.92 (0.14)	0.90 (0.16)	0.87 (0.15)	0.89 (0.20)	0.88 (0.15)
All others ¹	0.81 (0.23)	§	§	§	§	§
Any multiple class antidiabetic drug use	0.88 (0.14)	0.89 (0.15)	0.89 (0.13)	0.88 (0.13)	0.87 (0.14)	0.85 (0.16)
Sulfonylureas + Metformin	0.88 (0.14)	0.90 (0.15)	0.91 (0.12)	0.90 (0.12)	0.88 (0.12)	0.82 (0.19)
Sulfonylureas + Metformin + TZD	0.87 (0.13)	0.86 (0.16)	0.88 (0.13)	0.88 (0.12)	0.86 (0.14)	0.84 (0.13)
Sulfonylureas + TZD	0.89 (0.13)	0.91 (0.08)	0.90 (0.13)	0.91 (0.12)	0.90 (0.14)	0.86 (0.14)
Metformin + TZD	0.91 (0.13)	0.90 (0.17)	0.90 (0.12)	0.91 (0.12)	0.94 (0.08)	0.88 (0.16)
Insulin + any other antidiabetic drug(s)	0.87 (0.15)	0.86 (0.16)	0.89 (0.14)	0.86 (0.15)	0.87 (0.16)	0.86 (0.15)
All other combinations	0.84 (0.14)	§	0.85 (0.17)	0.87 (0.13)	0.83 (0.13)	0.81 (0.16)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.15)	0.89 (0.15)	0.90 (0.15)	0.90 (0.15)	0.90 (0.15)	0.88 (0.15)
ACE inhibitors only	0.90 (0.15)	0.91 (0.14)	0.91 (0.15)	0.90 (0.15)	0.90 (0.15)	0.88 (0.15)
Angiotensin Receptor Blocker only (ARB)	0.88 (0.16)	0.85 (0.18)	0.90 (0.15)	0.89 (0.15)	0.89 (0.15)	0.86 (0.17)
Both ACE inhibitors + ARBs	0.88 (0.14)	0.90 (0.09)	0.89 (0.12)	0.89 (0.16)	0.89 (0.12)	0.87 (0.14)
Antihyperlipidemics (AHL D)						
Any AHL D	0.87 (0.16)	0.88 (0.16)	0.89 (0.15)	0.88 (0.17)	0.87 (0.16)	0.86 (0.16)
Statins	0.88 (0.16)	0.88 (0.16)	0.89 (0.15)	0.88 (0.17)	0.87 (0.16)	0.86 (0.15)
Other lipid lowering drugs ²	0.86 (0.19)	0.88 (0.18)	0.89 (0.19)	0.86 (0.18)	0.86 (0.19)	0.84 (0.19)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10

Table 5.2.4 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (Non-LIS Sample with COPD and Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.15)	§	0.90 (0.12)	0.90 (0.14)	0.90 (0.12)	0.86 (0.16)
Any single class antidiabetic drug use	0.89 (0.15)	§	§	0.90 (0.16)	0.93 (0.09)	0.87 (0.17)
Sulfonylureas	0.89 (0.16)	§	§	0.84 (0.21)	0.94 (0.09)	0.87 (0.18)
Metformin	0.90 (0.13)	§	§	§	0.92 (0.09)	0.88 (0.16)
Thiazolidinediones (TZD)	0.90 (0.13)	§	§	§	0.91 (0.07)	0.85 (0.18)
All others ¹	§	§	§	§	§	§
Any multiple class antidiabetic drug use	0.87 (0.14)	§	§	0.90 (0.13)	0.87 (0.14)	0.86 (0.15)
Sulfonylureas + Metformin	0.88 (0.13)	§	§	§	0.90 (0.11)	0.86 (0.14)
Sulfonylureas + Metformin + TZD	0.89 (0.12)	§	§	§	§	0.88 (0.12)
Sulfonylureas + TZD	0.86 (0.12)	§	§	§	§	§
Metformin + TZD	0.83 (0.15)	§	§	§	§	§
Insulin + any other antidiabetic drug(s)	0.87 (0.16)	§	§	0.93 (0.14)	0.86 (0.16)	0.87 (0.16)
All other combinations	0.85 (0.13)	§	§	§	§	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.88 (0.15)	§	0.89 (0.17)	0.88 (0.13)	0.89 (0.16)	0.88 (0.16)
ACE inhibitors only	0.88 (0.16)	§	0.84 (0.20)	0.87 (0.15)	0.90 (0.15)	0.88 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.88 (0.15)	§	§	0.89 (0.09)	0.87 (0.19)	0.88 (0.14)
Both ACE inhibitors + ARBs	0.87 (0.14)	§	§	§	§	0.85 (0.15)
Antihyperlipidemics (AHLI)						
Any AHLI	0.85 (0.18)	§	0.89 (0.17)	0.84 (0.17)	0.86 (0.17)	0.84 (0.18)
Statins	0.85 (0.17)	§	0.89 (0.17)	0.84 (0.17)	0.86 (0.18)	0.84 (0.17)
Other lipid lowering drugs ²	0.85 (0.19)	§	§	§	0.86 (0.15)	0.84 (0.22)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 5.3 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.87 (0.16)	0.87 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.17)
Any single class antidiabetic drug use	0.88 (0.17)	0.88 (0.17)	0.89 (0.16)	0.89 (0.17)	0.88 (0.17)	0.86 (0.18)
Sulfonylureas	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.86 (0.18)
Metformin	0.87 (0.18)	0.87 (0.18)	0.88 (0.17)	0.87 (0.18)	0.86 (0.18)	0.86 (0.18)
Thiazolidinediones (TZD)	0.89 (0.15)	0.90 (0.15)	0.89 (0.15)	0.90 (0.15)	0.89 (0.16)	0.88 (0.16)
All others ¹	0.84 (0.21)	0.83 (0.22)	0.87 (0.19)	0.84 (0.19)	0.82 (0.22)	0.83 (0.20)
Any multiple class antidiabetic drug use	0.87 (0.16)	0.86 (0.17)	0.87 (0.16)	0.87 (0.16)	0.87 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.87 (0.16)	0.86 (0.17)	0.87 (0.16)	0.87 (0.16)	0.87 (0.16)	0.85 (0.16)
Sulfonylureas + Metformin + TZD	0.85 (0.16)	0.85 (0.16)	0.86 (0.16)	0.86 (0.15)	0.86 (0.15)	0.83 (0.16)
Sulfonylureas + TZD	0.88 (0.15)	0.88 (0.15)	0.88 (0.15)	0.89 (0.14)	0.89 (0.14)	0.86 (0.15)
Metformin + TZD	0.86 (0.17)	0.84 (0.18)	0.86 (0.17)	0.87 (0.15)	0.86 (0.16)	0.85 (0.17)
Insulin + any other antidiabetic drug(s)	0.87 (0.16)	0.86 (0.18)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
All other combinations	0.85 (0.15)	0.84 (0.17)	0.85 (0.16)	0.85 (0.15)	0.87 (0.14)	0.84 (0.15)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.15)	0.87 (0.17)
ACE inhibitors only	0.89 (0.16)	0.89 (0.16)	0.91 (0.15)	0.91 (0.15)	0.89 (0.16)	0.87 (0.17)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.15)	0.87 (0.16)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.88 (0.14)	0.89 (0.15)	0.88 (0.15)	0.88 (0.15)	0.86 (0.15)
Antihyperlipidemics (AHLI)						
Any AHLI	0.87 (0.17)	0.87 (0.17)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.86 (0.17)
Statins	0.87 (0.17)	0.87 (0.17)	0.88 (0.17)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Other lipid lowering drugs ²	0.87 (0.18)	0.87 (0.18)	0.89 (0.16)	0.88 (0.17)	0.87 (0.18)	0.85 (0.20)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.3.1 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Diabetes only)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.87 (0.17)	0.87 (0.17)	0.88 (0.16)	0.88 (0.16)	0.87 (0.16)	0.85 (0.17)
Any single class antidiabetic drug use	0.88 (0.17)	0.88 (0.17)	0.89 (0.16)	0.89 (0.17)	0.88 (0.17)	0.86 (0.18)
Sulfonylureas	0.89 (0.17)	0.89 (0.17)	0.90 (0.16)	0.90 (0.16)	0.89 (0.16)	0.85 (0.19)
Metformin	0.87 (0.18)	0.87 (0.18)	0.88 (0.17)	0.87 (0.18)	0.87 (0.17)	0.86 (0.18)
Thiazolidinediones (TZD)	0.89 (0.16)	0.90 (0.15)	0.89 (0.15)	0.90 (0.15)	0.88 (0.16)	0.87 (0.16)
All others ¹	0.84 (0.21)	0.82 (0.22)	0.89 (0.16)	0.85 (0.19)	0.80 (0.23)	0.83 (0.21)
Any multiple class antidiabetic drug use	0.86 (0.16)	0.86 (0.17)	0.87 (0.16)	0.87 (0.16)	0.87 (0.16)	0.85 (0.16)
Sulfonylureas + Metformin	0.86 (0.16)	0.86 (0.17)	0.87 (0.16)	0.87 (0.16)	0.87 (0.15)	0.85 (0.16)
Sulfonylureas + Metformin + TZD	0.85 (0.16)	0.85 (0.16)	0.86 (0.15)	0.86 (0.15)	0.86 (0.15)	0.82 (0.16)
Sulfonylureas + TZD	0.88 (0.15)	0.89 (0.15)	0.88 (0.15)	0.89 (0.14)	0.89 (0.14)	0.87 (0.15)
Metformin + TZD	0.86 (0.17)	0.84 (0.18)	0.86 (0.17)	0.87 (0.15)	0.86 (0.16)	0.85 (0.17)
Insulin + any other antidiabetic drug(s)	0.87 (0.17)	0.86 (0.18)	0.87 (0.17)	0.88 (0.16)	0.87 (0.16)	0.86 (0.17)
All other combinations	0.85 (0.15)	0.84 (0.17)	0.85 (0.16)	0.86 (0.15)	0.86 (0.14)	0.83 (0.14)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.15)	0.87 (0.17)
ACE inhibitors only	0.89 (0.16)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.17)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.15)	0.89 (0.16)	0.90 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.16)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.87 (0.15)	0.89 (0.15)	0.89 (0.15)	0.89 (0.14)	0.87 (0.15)
Antihyperlipidemics (AHL D)						
Any AHL D	0.87 (0.17)	0.87 (0.17)	0.88 (0.17)	0.88 (0.16)	0.87 (0.17)	0.86 (0.17)
Statins	0.87 (0.17)	0.87 (0.17)	0.88 (0.17)	0.88 (0.16)	0.87 (0.17)	0.86 (0.17)
Other lipid lowering drugs ²	0.87 (0.18)	0.87 (0.18)	0.89 (0.17)	0.88 (0.17)	0.87 (0.19)	0.85 (0.20)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 5.3.2 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and no Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.87 (0.16)	0.89 (0.15)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Any single class antidiabetic drug use	0.88 (0.17)	0.89 (0.15)	0.91 (0.16)	0.88 (0.18)	0.88 (0.17)	0.86 (0.18)
Sulfonylureas	0.88 (0.17)	0.93 (0.12)	0.93 (0.13)	0.88 (0.18)	0.88 (0.17)	0.87 (0.17)
Metformin	0.87 (0.17)	0.87 (0.17)	0.88 (0.19)	0.88 (0.17)	0.88 (0.16)	0.85 (0.18)
Thiazolidinediones (TZD)	0.89 (0.17)	0.91 (0.15)	0.92 (0.14)	0.87 (0.17)	0.90 (0.16)	0.87 (0.18)
All others ¹	0.83 (0.21)	§	§	§	0.82 (0.23)	0.85 (0.18)
Any multiple class antidiabetic drug use	0.87 (0.16)	0.88 (0.15)	0.87 (0.16)	0.88 (0.15)	0.88 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.87 (0.15)	0.91 (0.10)	0.87 (0.16)	0.89 (0.15)	0.86 (0.17)	0.86 (0.15)
Sulfonylureas + Metformin + TZD	0.86 (0.15)	0.84 (0.18)	0.84 (0.17)	0.87 (0.15)	0.88 (0.14)	0.84 (0.16)
Sulfonylureas + TZD	0.87 (0.15)	0.81 (0.21)	0.90 (0.14)	0.90 (0.14)	0.88 (0.15)	0.86 (0.14)
Metformin + TZD	0.87 (0.16)	0.88 (0.13)	0.88 (0.17)	0.87 (0.16)	0.88 (0.15)	0.87 (0.16)
Insulin + any other antidiabetic drug(s)	0.88 (0.16)	0.91 (0.16)	0.88 (0.17)	0.89 (0.15)	0.88 (0.16)	0.87 (0.16)
All other combinations	0.86 (0.14)	§	0.84 (0.16)	0.85 (0.14)	0.89 (0.13)	0.84 (0.16)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.16)	0.90 (0.15)	0.91 (0.15)	0.89 (0.16)	0.90 (0.15)	0.87 (0.16)
ACE inhibitors only	0.89 (0.16)	0.91 (0.15)	0.92 (0.14)	0.90 (0.15)	0.90 (0.15)	0.88 (0.16)
Angiotensin Receptor Blocker only (ARB)	0.88 (0.16)	0.89 (0.16)	0.90 (0.18)	0.89 (0.16)	0.90 (0.15)	0.87 (0.17)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.93 (0.08)	0.87 (0.15)	0.87 (0.17)	0.89 (0.15)	0.87 (0.15)
Antihyperlipidemics (AHLI)						
Any AHLI	0.87 (0.16)	0.89 (0.15)	0.89 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.17)
Statins	0.88 (0.16)	0.89 (0.15)	0.89 (0.16)	0.88 (0.16)	0.88 (0.15)	0.86 (0.17)
Other lipid lowering drugs ²	0.86 (0.19)	0.94 (0.14)	0.89 (0.16)	0.86 (0.17)	0.85 (0.18)	0.84 (0.21)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 5.3.3 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with Major Depression and no COPD)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.88 (0.16)	0.87 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.16)	0.86 (0.16)
Any single class antidiabetic drug use	0.88 (0.17)	0.88 (0.17)	0.89 (0.17)	0.89 (0.16)	0.87 (0.17)	0.87 (0.17)
Sulfonylureas	0.90 (0.15)	0.91 (0.14)	0.92 (0.13)	0.92 (0.13)	0.89 (0.15)	0.87 (0.17)
Metformin	0.86 (0.18)	0.85 (0.18)	0.87 (0.19)	0.87 (0.18)	0.85 (0.19)	0.85 (0.18)
Thiazolidinediones (TZD)	0.90 (0.14)	0.92 (0.14)	0.90 (0.14)	0.91 (0.13)	0.89 (0.15)	0.90 (0.14)
All others ¹	0.85 (0.21)	0.91 (0.11)	§	0.85 (0.20)	0.86 (0.19)	0.86 (0.22)
Any multiple class antidiabetic drug use	0.87 (0.16)	0.86 (0.17)	0.88 (0.16)	0.88 (0.16)	0.88 (0.15)	0.86 (0.15)
Sulfonylureas + Metformin	0.87 (0.16)	0.85 (0.19)	0.88 (0.15)	0.87 (0.17)	0.87 (0.16)	0.85 (0.16)
Sulfonylureas + Metformin + TZD	0.85 (0.15)	0.85 (0.16)	0.85 (0.15)	0.86 (0.15)	0.85 (0.15)	0.84 (0.13)
Sulfonylureas + TZD	0.89 (0.13)	0.87 (0.11)	0.90 (0.14)	0.89 (0.14)	0.90 (0.12)	0.86 (0.15)
Metformin + TZD	0.86 (0.17)	0.84 (0.18)	0.88 (0.17)	0.87 (0.15)	0.86 (0.18)	0.85 (0.16)
Insulin + any other antidiabetic drug(s)	0.88 (0.16)	0.88 (0.16)	0.89 (0.16)	0.90 (0.15)	0.89 (0.15)	0.87 (0.16)
All other combinations	0.85 (0.15)	0.85 (0.16)	0.85 (0.17)	0.83 (0.17)	0.88 (0.13)	0.85 (0.14)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.89 (0.16)	0.91 (0.15)	0.91 (0.15)	0.90 (0.15)	0.89 (0.16)	0.87 (0.16)
ACE inhibitors only	0.89 (0.16)	0.91 (0.15)	0.91 (0.15)	0.91 (0.14)	0.90 (0.16)	0.87 (0.17)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.16)	0.91 (0.15)	0.90 (0.15)	0.89 (0.15)	0.89 (0.16)	0.88 (0.16)
Both ACE inhibitors + ARBs	0.88 (0.15)	0.90 (0.13)	0.90 (0.14)	0.88 (0.15)	0.88 (0.17)	0.86 (0.15)
Antihyperlipidemics (AHLI)						
Any AHLI	0.88 (0.16)	0.88 (0.17)	0.89 (0.16)	0.89 (0.16)	0.88 (0.16)	0.87 (0.16)
Statins	0.88 (0.16)	0.88 (0.17)	0.89 (0.16)	0.89 (0.16)	0.88 (0.16)	0.87 (0.16)
Other lipid lowering drugs ²	0.88 (0.18)	0.92 (0.11)	0.89 (0.15)	0.87 (0.18)	0.89 (0.16)	0.86 (0.21)

Source: CCW 5% file. 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 5.3.4 Annual MPR for Drugs by Quintile of Medicare Spending in 2006 (LIS Sample with COPD and Major Depression)

Drug Class	Annual Medication Possession Ratio (MPR, mean and SD)					
	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Antidiabetic drugs						
Any oral antidiabetic drug	0.87 (0.17)	0.89 (0.15)	0.90 (0.15)	0.89 (0.17)	0.88 (0.16)	0.86 (0.17)
Any single class antidiabetic drug use	0.87 (0.17)	0.89 (0.15)	0.91 (0.14)	0.91 (0.15)	0.87 (0.17)	0.86 (0.18)
Sulfonylureas	0.88 (0.17)	0.84 (0.19)	0.91 (0.15)	0.96 (0.10)	0.87 (0.17)	0.86 (0.18)
Metformin	0.87 (0.18)	0.93 (0.08)	0.92 (0.12)	0.89 (0.16)	0.85 (0.19)	0.85 (0.19)
Thiazolidinediones (TZD)	0.89 (0.15)	§	0.90 (0.17)	0.87 (0.22)	0.91 (0.13)	0.88 (0.15)
All others ¹	0.82 (0.19)	§	§	§	§	0.81 (0.19)
Any multiple class antidiabetic drug use	0.87 (0.16)	0.90 (0.16)	0.89 (0.16)	0.88 (0.18)	0.88 (0.15)	0.86 (0.16)
Sulfonylureas + Metformin	0.86 (0.16)	§	0.84 (0.16)	0.86 (0.19)	0.88 (0.14)	0.84 (0.16)
Sulfonylureas + Metformin + TZD	0.86 (0.15)	§	§	0.91 (0.12)	0.87 (0.13)	0.83 (0.17)
Sulfonylureas + TZD	0.86 (0.16)	§	§	0.87 (0.18)	0.88 (0.16)	0.85 (0.15)
Metformin + TZD	0.86 (0.17)	§	§	0.88 (0.19)	0.88 (0.15)	0.83 (0.17)
Insulin + any other antidiabetic drug(s)	0.87 (0.16)	0.96 (0.10)	0.90 (0.17)	0.89 (0.18)	0.89 (0.16)	0.86 (0.16)
All other combinations	0.84 (0.15)	§	§	0.83 (0.16)	0.86 (0.13)	0.82 (0.17)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	0.88 (0.16)	0.91 (0.13)	0.92 (0.13)	0.91 (0.16)	0.89 (0.16)	0.87 (0.17)
ACE inhibitors only	0.88 (0.16)	0.93 (0.13)	0.92 (0.14)	0.91 (0.16)	0.89 (0.16)	0.87 (0.17)
Angiotensin Receptor Blocker only (ARB)	0.89 (0.15)	0.86 (0.13)	0.92 (0.10)	0.92 (0.14)	0.89 (0.15)	0.88 (0.16)
Both ACE inhibitors + ARBs	0.85 (0.17)	§	0.92 (0.14)	0.86 (0.22)	0.85 (0.17)	0.84 (0.16)
Antihyperlipidemics (AHLI)						
Any AHLI	0.87 (0.16)	0.89 (0.16)	0.91 (0.15)	0.89 (0.16)	0.88 (0.16)	0.86 (0.17)
Statins	0.87 (0.16)	0.89 (0.16)	0.91 (0.15)	0.89 (0.16)	0.88 (0.16)	0.86 (0.17)
Other lipid lowering drugs ²	0.87 (0.17)	§	0.91 (0.12)	0.86 (0.17)	0.91 (0.13)	0.86 (0.19)

Source: CCW 5% file, 2006

¹ Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

² Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10 .

Table 6. Regression Results Predicting Any Use of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006

	Any Use of Drug Class					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	151,460		151,460		151,460	
Variables	Odds Ratio	SE	Odds Ratio	SE	Odds Ratio	SE
LIS enrollee	0.8298***	0.011	0.7608***	0.0106	0.6942***	0.0098
Type II Diabetes	reference		reference		reference	
Type I Diabetes	0.2369***	0.0047	0.8678***	0.0177	0.8212***	0.0168
Both type I and II diabetes	0.2085***	0.0045	0.9831	0.0223	0.9231***	0.0207
Diabetes type undetermined	0.5582***	0.0078	0.8206***	0.0122	0.8689***	0.013
Diabetes complications	1.2674***	0.0158	1.1791***	0.0154	1.0498***	0.0138
Chronic kidney disease	0.6167***	0.0114	1.1214***	0.0216	1.1689***	0.0226
COPD	0.8529***	0.0142	0.7030***	0.0121	0.6669***	0.0117
Major depression	0.8064***	0.0126	0.6445***	0.0103	0.6245***	0.0102
RxHCC ¹	0.9180***	0.0025	0.9284***	0.0026	0.9850***	0.0028
Total maintenance drug count	1.0690***	0.0016	1.2302***	0.0022	1.2526***	0.0023
Age 67-69 years	reference		reference		reference	
<67 years	0.8343***	0.0169	0.6616***	0.0142	0.7857***	0.0171
70 - 74 years	0.9947	0.0208	0.9942	0.0224	0.9802	0.0223
75 - 79 years	0.9525*	0.0203	0.9679	0.0221	0.8820***	0.0203
80+ years	0.7905***	0.0159	0.8050***	0.0171	0.5162***	0.0111
Male	1.0106	0.0123	1.0073	0.0127	1.1166***	0.0144
White	reference		reference		reference	
Black	0.8572***	0.0136	1.3514***	0.0226	0.7456***	0.0123
Asian	1.2622***	0.0422	1.1484***	0.0407	1.2845***	0.047
Hispanic	1.1459***	0.0306	1.2118***	0.0341	0.9915	0.028
Other race	1.0025	0.0365	1.1876***	0.0455	1.0351	0.0401

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

Table 6. Regression Results Predicting Any Use of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006 (continued)

	Any Use of Drug Class					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	151,460		151,460		151,460	
Variables	Odds Ratio	SE	Odds Ratio	SE	Odds Ratio	SE
South	reference		reference		reference	
Midwest	0.9999	0.0145	0.9963	0.0151	1.1647***	0.0179
Northeast	0.97	0.0152	0.9729	0.0158	1.2835***	0.0214
West	0.9629*	0.0165	1.0657***	0.0192	1.1168***	0.0203
Region unknown	0.8397*	0.0598	0.9506	0.0702	0.7774***	0.0584
< 5 physician visits	reference		reference		reference	
5 - 9 physician visits	0.9454**	0.0185	0.9981	0.0203	1.0083	0.0208
10 - 14 physician visits	0.8669***	0.0188	0.9290**	0.021	0.8639***	0.0198
15+ physician visits	0.7887***	0.0171	0.8012***	0.0182	0.6978***	0.0161
Eye exam ¹	1.0636***	0.0123	1.0509***	0.0127	1.1155***	0.0136
HbA1C	1.8156***	0.0261	1.0892***	0.016	0.7136***	0.0107
LDL test	0.8316***	0.0119	1.1802***	0.0174	2.8016***	0.0423
Hospital days	0.9984**	0.0005	0.9982***	0.0005	0.9914***	0.0006
Quintile 1	reference		reference		reference	
Quintile 2	0.9210***	0.0168	0.986	0.0189	0.9692	0.0188
Quintile 3	0.8913***	0.0176	0.9402**	0.0194	0.9041***	0.019
Quintile 4	0.8383***	0.0182	0.9237***	0.021	0.7913***	0.0182
Quintile 5	0.6314***	0.0164	0.8633***	0.0231	0.6831***	0.0186

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

Table 7. Regression Results Predicting Duration of Therapy among Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006

	Duration of Therapy					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	91,593		98,064		91,372	
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	287.2927***	1.59	279.6022***	1.679	244.0545***	1.8493
LIS enrollee	4.8105***	0.7055	5.1637***	0.7209	12.3005***	0.7877
Type II Diabetes	Reference		Reference		Reference	
Type I Diabetes	-2.3257*	0.9885	4.5008***	1.0089	3.4494**	1.1159
Both type I and II diabetes	-10.2257***	1.0137	-0.6826	1.0525	-0.4527	1.161
Diabetes type undetermined	-0.9853	0.7022	2.7636***	0.7516	4.5967***	0.8203
Diabetes complications	7.6142***	0.6358	1.2966*	0.6594	0.4513	0.7266
Chronic kidney disease	-6.9701***	0.9798	-5.8200***	0.9149	6.6151***	1.0182
COPD	-7.8927***	0.9026	-4.4502***	0.8945	-5.9279***	0.9785
Major depression	-5.0293***	0.8328	-2.9530***	0.8492	-4.4841***	0.9257
RxHCC ¹	-2.6667***	0.1512	-2.0037***	0.1499	-1.8961***	0.1646
Total maintenance drug count	3.0986***	0.0835	2.6709***	0.0845	3.9605***	0.0931
Age 67-69 years	Reference		Reference		Reference	
<67 years	-8.6960***	1.0345	-6.8104***	1.0775	-5.8638***	1.1541
70 - 74 years	2.3596*	1.0668	2.0813	1.0979	3.3711**	1.175
75 - 79 years	3.3629**	1.0978	3.7794***	1.1214	4.9802***	1.2056
80+ years	3.8612***	1.0496	4.7219***	1.0703	7.8743***	1.1764
Male	-0.0179	0.638	-1.9044**	0.6588	3.8313***	0.7105
White	Reference		Reference		Reference	
Black	-10.9499***	0.8367	-3.4139***	0.833	-17.0971***	0.9701
Asian	-8.5997***	1.7285	-9.6120***	1.7938	-8.1747***	1.9018
Hispanic	-12.2850***	1.3747	-13.7039***	1.4255	-22.6485***	1.5752
Other race	-13.3754***	1.9214	-11.6419***	1.9677	-15.0973***	2.1625

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

Table 7. Regression Results Predicting Duration of Therapy among Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006 (continued)

	Duration of Therapy					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	91,593		98,064		91,372	
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
South	Reference		Reference		Reference	
Midwest	4.0769***	0.7627	6.4382***	0.781	11.7255***	0.8574
Northeast	0.6693	0.8455	-0.9503	0.8542	7.5777***	0.9219
West	-6.4979***	0.9019	-5.7383***	0.9255	-1.6471	1.0132
Region unknown	-8.7700*	3.928	-10.0776*	3.9581	-12.2920**	4.4245
< 5 physician visits	Reference		Reference		Reference	
5 - 9 physician visits	2.1607*	1.0187	0.9325	1.0917	0.9454	1.1963
10 - 14 physician visits	0.2972	1.1385	-1.1117	1.2057	-1.1391	1.3263
15+ physician visits	-4.0545***	1.153	-6.0535***	1.2212	-5.6955***	1.3523
Eye exam ¹	6.3383***	0.6075	5.2702***	0.6199	6.1768***	0.6784
HbA1C	5.5332***	0.8227	1.7338*	0.7885	1.128	0.8981
LDL test	-1.2017	0.8069	0.5196	0.7819	1.1972	0.8953
Hospital days	-0.6025***	0.029	-0.7149***	0.0288	-0.7172***	0.0322
Quintile 1	Reference		Reference		Reference	
Quintile 2	0.9821	0.9565	-0.0986	1.0152	-0.8927	1.1039
Quintile 3	-1.6411	1.0414	-2.4614*	1.0978	-3.7527**	1.1993
Quintile 4	-4.3508***	1.159	-6.8327***	1.2038	-7.6155***	1.3316
Quintile 5	-16.5562***	1.4052	-19.8659***	1.4157	-15.9372***	1.5742

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

Table 8. Regression Results Predicting Medications Possession Ratio for Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006

	Medication Possession Ratio (MPR)					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	91,593		98,064		91,372	
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	0.8533***	0.0028	0.8872***	0.0027	0.8500***	0.0031
LIS enrollee	-0.0001	0.0012	0.0011	0.0012	0.0096***	0.0013
Type II Diabetes	Reference		Reference		Reference	
Type I Diabetes	0.0138***	0.0017	0.0086***	0.0016	0.0101***	0.0019
Both type I and II diabetes	0.0022	0.0018	-0.0006	0.0017	0.0006	0.0019
Diabetes type undetermined	0.0129***	0.0012	0.0074***	0.0012	0.0057***	0.0014
Diabetes complications	-0.0032**	0.0011	-0.0012	0.0011	0.001	0.0012
Chronic kidney disease	0.0051**	0.0017	-0.0001	0.0015	0.0028	0.0017
COPD	-0.0017	0.0016	-0.0041**	0.0014	-0.0014	0.0016
Major depression	0.0005	0.0015	-0.0028*	0.0014	0.0026	0.0015
RxHCC ¹	0	0.0003	-0.0007**	0.0002	-0.0005	0.0003
Total maintenance drug count	0.0015***	0.0001	0.0015***	0.0001	0.0011***	0.0002
Age 67-69 years	Reference		Reference		Reference	
<67 years	-0.0112***	0.0018	-0.0131***	0.0017	-0.0009	0.0019
70 - 74 years	0.0069***	0.0019	0.0040*	0.0018	0.0043*	0.002
75 - 79 years	0.0142***	0.0019	0.0096***	0.0018	0.0114***	0.002
80+ years	0.0213***	0.0019	0.0157***	0.0017	0.0189***	0.002
Male	0.0086***	0.0011	0.0025*	0.0011	0.0114***	0.0012
White	Reference		Reference		Reference	
Black	-0.0392***	0.0015	-0.0365***	0.0013	-0.0376***	0.0016
Asian	-0.0037	0.0031	-0.0085**	0.0029	-0.0097**	0.0032
Hispanic	-0.0438***	0.0024	-0.0322***	0.0023	-0.0432***	0.0026
Other race	-0.0182***	0.0034	-0.0173***	0.0032	-0.0162***	0.0036

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ RxHCC = A count of medication-sensitive conditions based on Prescription Drug Hierarchical Coexisting Conditions.

Table 8. Regression Results Predicting Medications Possession Ratio for Users of Oral Antidiabetic Drugs, ACE Inhibitors/ARBs, and Antihyperlipidemics among Medicare Beneficiaries in 2006 (continued)

	Medication Possession Ratio (MPR)					
	Oral Antidiabetic Drugs		ACE Inhibitor/ARBs (RAASI)		Antihyperlipidemics (AHLI)	
Sample Size	91,593		98,064		91,372	
Variables	Coefficient	SE	Coefficient	SE	Coefficient	SE
South	Reference		Reference		Reference	
Midwest	0.0143***	0.0013	0.0111***	0.0013	0.0148***	0.0014
Northeast	0.0106***	0.0015	0.0100***	0.0014	0.0129***	0.0015
West	-0.0111***	0.0016	-0.0049***	0.0015	0.0042*	0.0017
Region unknown	-0.0215**	0.0069	-0.0255***	0.0064	-0.0079	0.0074
< 5 physician visits	Reference		Reference		Reference	
5 - 9 physician visits	0.0050**	0.0018	0.0033	0.0018	0.0003	0.002
10 - 14 physician visits	0.0064**	0.002	0.0061**	0.0019	0.0019	0.0022
15+ physician visits	0.0044*	0.002	0.0033	0.002	-0.0006	0.0023
Eye exam ¹	0.0086***	0.0011	0.0065***	0.001	0.0061***	0.0011
HbA1C	0.0019	0.0015	0.0007	0.0013	0.0007	0.0015
LDL test	-0.0035*	0.0014	-0.0016	0.0013	-0.0017	0.0015
Hospital days	-0.0004***	0.0001	-0.0004***	0	-0.0004***	0.0001
Quintile 1	Reference		Reference		Reference	
Quintile 2	0.0001	0.0017	0.001	0.0016	0.0019	0.0018
Quintile 3	-0.0026	0.0018	-0.0025	0.0018	-0.0027	0.002
Quintile 4	-0.0076***	0.002	-0.0103***	0.0019	-0.0048*	0.0022
Quintile 5	-0.0201***	0.0025	-0.0228***	0.0023	-0.0135***	0.0026

* p<0.05, ** p<0.01, *** p<0.001

Source: CCW 5% file, 2006

¹ Codes identify eye exams and are a proxy for dilated eye examinations.

Table 9. Drug Coverage Status of Medicare Beneficiaries with Diabetes in 2006¹

Drug Coverage Type	N (column %) with Any Evidence of Coverage (nonexclusive categories)	N (row %) with Full Year Coverage	N (row %) with Partial Year Coverage
Prescription drug plan (PDP)	235,078 (51.8%)	151,460 (64.4%)	83,618 (35.6%)
Medicare Advantage prescription drug plan (MA-PD)	21,223 (4.7%)	12,498 (58.9%)	8,725 (41.1%)
Retire drug subsidy (RDS)	88,985 (19.6%)	88,612 (99.6%)	373 (0.4%)
Other creditable drug coverage ²	88,658 (19.6%)	NA	NA
No creditable drug coverage	59,441 (13.1%)	NA	NA
Total	453,584	NA	NA

¹Includes all beneficiaries in the original sample (N=510,697) who were survivors, covered for Part A and B throughout 2006, had no duplicate ID, nor missing days supply on PDEs for drugs of interest (N=453,584)

²Includes persons with 1 or more of 5 creditable coverage types (Federal employees health benefits [FEHB], Tricare, Veterans Administration [VA], state pharmaceutical assistance plan [SPAP] or working aged) for at least one month in the year.

Table 10.1 Prevalence of Use of Antidiabetic Medications by Beneficiaries with Diabetes, (Full Sample)

Drug Class	Number and Percent with any Drug Use					
	Study Sample			PDP	MA-PD	
	Full Year Enrollees	First Quarter Enrollees	Fourth Quarter Enrollees	Post January Enrollees	Full Year Enrollees	Post January Enrollees
Total sample size	151,460 (100.0%)	151,460 (100.0%)	151,460 (100.0%)	83,618 (100.0%)	12,498 (100.0%)	8,725 (100.0%)
Antidiabetic drugs						
Any antidiabetic drug	107,121 (70.7%)	90,225 (59.6%)	97,405 (64.3%)	52,432 (62.7%)	9,800 (78.4%)	5,766 (66.1%)
Any oral antidiabetic drug	70,507 (46.6%)	63,269 (41.8%)	67,136 (44.3%)	38,500 (46.0%)	6,542 (52.3%)	4,142 (47.5%)
Any single class antidiabetic drug use	50,400 (33.3%)	49,528 (32.7%)	53,162 (35.1%)	27,933 (33.4%)	4,378 (35.0%)	2,750 (31.5%)
Sulfonylureas	14,270 (9.4%)	15,037 (9.9%)	15,349 (10.1%)	9,287 (11.1%)	1,442 (11.5%)	970 (11.1%)
Metformin	13,700 (9.0%)	12,891 (8.5%)	14,063 (9.3%)	8,187 (9.8%)	1,207 (9.7%)	792 (9.1%)
Thiazolidinediones (TZD)	5,994 (4.0%)	6,490 (4.3%)	6,722 (4.4%)	2,975 (3.6%)	344 (2.8%)	243 (2.8%)
Insulin	15,528 (10.3%)	14,140 (9.3%)	15,940 (10.5%)	6,958 (8.3%)	1,333 (10.7%)	709 (8.1%)
All others ¹	908 (0.6%)	970 (0.6%)	1,088 (0.7%)	526 (0.6%)	52 (0.4%)	36 (0.4%)
Any multiple class antidiabetic drug use	56,721 (37.4%)	40,697 (26.9%)	44,243 (29.2%)	24,499 (29.3%)	5,422 (43.4%)	3,016 (34.6%)
Sulfonylureas + Metformin	13,453 (8.9%)	11,769 (7.8%)	12,269 (8.1%)	8,002 (9.6%)	1,630 (13.0%)	1,112 (12.7%)
Sulfonylureas + Metformin + TZD	8,137 (5.4%)	5,214 (3.4%)	5,551 (3.7%)	3,353 (4.0%)	796 (6.4%)	415 (4.8%)
Sulfonylureas + TZD	5,112 (3.4%)	4,389 (2.9%)	4,739 (3.1%)	2,456 (2.9%)	409 (3.3%)	224 (2.6%)
Metformin + TZD	5,441 (3.6%)	4,420 (2.9%)	4,816 (3.2%)	2,317 (2.8%)	415 (3.3%)	241 (2.8%)
Insulin + any other antidiabetic drug(s)	21,086 (13.9%)	12,816 (8.5%)	14,329 (9.5%)	6,974 (8.3%)	1,925 (15.4%)	915 (10.5%)
All other combinations	3,492 (2.3%)	2,089 (1.4%)	2,539 (1.7%)	1,397 (1.7%)	247 (2.0%)	109 (1.2%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	98,064 (64.7%)	79,451 (52.5%)	84,306 (55.7%)	47,530 (56.8%)	8,585 (68.7%)	5,085 (58.3%)
ACE inhibitors only	61,370 (40.5%)	51,564 (34.0%)	54,636 (36.1%)	30,608 (36.6%)	5,761 (46.1%)	3,372 (38.6%)
Angiotensin Receptor Blocker only (ARB)	27,557 (18.2%)	24,228 (16.0%)	25,736 (17.0%)	13,719 (16.4%)	2,003 (16.0%)	1,261 (14.5%)
Both ACE inhibitors + ARBs	9,137 (6.0%)	3,659 (2.4%)	3,934 (2.6%)	3,203 (3.8%)	821 (6.6%)	452 (5.2%)
Antihyperlipidemics (AHL)						
Any AHL	91,372 (60.3%)	70,322 (46.4%)	77,287 (51.0%)	42,210 (50.5%)	7,583 (60.7%)	4,356 (49.9%)
Statins	83,975 (55.4%)	63,659 (42.0%)	70,231 (46.4%)	38,178 (45.7%)	6,966 (55.7%)	3,996 (45.8%)
Other lipid lowering drugs ²	7,397 (4.9%)	6,663 (4.4%)	7,056 (4.7%)	4,032 (4.8%)	617 (4.9%)	360 (4.1%)

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 10.1.1 Prevalence of Use of Antidiabetic Medications by Beneficiaries with Diabetes, (Diabetes Only)

Drug Class	Number and Percent with any Drug Use					
	Study Sample			PDP	MA-PD	
	Full Year Enrollees	First Quarter Enrollees	Fourth Quarter Enrollees	Post January Enrollees	Full Year Enrollees	Post January Enrollees
Total sample size	105,028 (100.0%)	105,028 (100.0%)	105,028 (100.0%)	64,363 (100.0%)	11,921 (100.0%)	7,808 (100.0%)
Antidiabetic drugs						
Any antidiabetic drug	75,718 (72.1%)	64,262 (61.2%)	69,284 (66.0%)	41,010 (63.7%)	9,380 (78.7%)	5,229 (67.0%)
Any oral antidiabetic drug	52,791 (50.3%)	47,006 (44.8%)	50,118 (47.7%)	31,083 (48.3%)	6,292 (52.8%)	3,804 (48.7%)
Any single class antidiabetic drug use	35,491 (33.8%)	34,941 (33.3%)	37,348 (35.6%)	21,585 (33.5%)	4,183 (35.1%)	2,486 (31.8%)
Sulfonylureas	10,437 (9.9%)	10,952 (10.4%)	11,170 (10.6%)	7,237 (11.2%)	1,382 (11.6%)	875 (11.2%)
Metformin	10,112 (9.6%)	9,504 (9.0%)	10,405 (9.9%)	6,581 (10.2%)	1,152 (9.7%)	730 (9.3%)
Thiazolidinediones (TZD)	4,390 (4.2%)	4,705 (4.5%)	4,939 (4.7%)	2,380 (3.7%)	329 (2.8%)	219 (2.8%)
Insulin	9,913 (9.4%)	9,097 (8.7%)	10,085 (9.6%)	4,995 (7.8%)	1,269 (10.6%)	628 (8.0%)
All others ¹	639 (0.6%)	683 (0.7%)	749 (0.7%)	392 (0.6%)	51 (0.4%)	34 (0.4%)
Any multiple class antidiabetic drug use	40,227 (38.3%)	29,321 (27.9%)	31,936 (30.4%)	19,425 (30.2%)	5,197 (43.6%)	2,743 (35.1%)
Sulfonylureas + Metformin	10,409 (9.9%)	9,073 (8.6%)	9,508 (9.1%)	6,668 (10.4%)	1,581 (13.3%)	1,026 (13.1%)
Sulfonylureas + Metformin + TZD	6,281 (6.0%)	4,001 (3.8%)	4,315 (4.1%)	2,813 (4.4%)	768 (6.4%)	389 (5.0%)
Sulfonylureas + TZD	3,885 (3.7%)	3,274 (3.1%)	3,598 (3.4%)	2,012 (3.1%)	395 (3.3%)	206 (2.6%)
Metformin + TZD	4,085 (3.9%)	3,290 (3.1%)	3,562 (3.4%)	1,867 (2.9%)	399 (3.3%)	224 (2.9%)
Insulin + any other antidiabetic drug(s)	13,014 (12.4%)	8,159 (7.8%)	9,081 (8.6%)	4,932 (7.7%)	1,819 (15.3%)	797 (10.2%)
All other combinations	2,553 (2.4%)	1,524 (1.5%)	1,872 (1.8%)	1,133 (1.8%)	235 (2.0%)	101 (1.3%)
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	69,546 (66.2%)	56,784 (54.1%)	60,631 (57.7%)	37,167 (57.7%)	8,214 (68.9%)	4,602 (58.9%)
ACE inhibitors only	43,124 (41.1%)	36,550 (34.8%)	38,931 (37.1%)	23,896 (37.1%)	5,494 (46.1%)	3,069 (39.3%)
Angiotensin Receptor Blocker only (ARB)	20,114 (19.2%)	17,630 (16.8%)	18,865 (18.0%)	10,835 (16.8%)	1,937 (16.2%)	1,123 (14.4%)
Both ACE inhibitors + ARBs	6,308 (6.0%)	2,604 (2.5%)	2,835 (2.7%)	2,436 (3.8%)	783 (6.6%)	410 (5.3%)
Antihyperlipidemics (AHL D)						
Any AHL D	64,523 (61.4%)	49,770 (47.4%)	54,855 (52.2%)	32,950 (51.2%)	7,239 (60.7%)	3,912 (50.1%)
Statins	59,406 (56.6%)	45,108 (42.9%)	49,941 (47.6%)	29,826 (46.3%)	6,651 (55.8%)	3,588 (46.0%)
Other lipid lowering drugs ²	5,117 (4.9%)	4,662 (4.4%)	4,914 (4.7%)	3,124 (4.9%)	588 (4.9%)	324 (4.1%)

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin.

Table 10.1.2 Prevalence of Use of Antidiabetic Medications by Beneficiaries with Diabetes, (Diabetes + COPD)

Drug Class	Number and Percent with any Drug Use					
	Study Sample			PDP	MA-PD	
	Full Year Enrollees	First Quarter Enrollees	Fourth Quarter Enrollees	Post January Enrollees	Full Year Enrollees	Post January Enrollees
Total sample size	17,019 (100.0%)	17,019 (100.0%)	17,019 (100.0%)	8,222 (100.0%)	205 (100.0%)	380 (100.0%)
Antidiabetic drugs						
Any antidiabetic drug	11,346 (66.7%)	9,353 (55.0%)	10,185 (59.8%)	4,830 (58.7%)	153 (74.6%)	211 (55.5%)
Any oral antidiabetic drug	6,730 (39.5%)	6,065 (35.6%)	6,465 (38.0%)	3,264 (39.7%)	84 (41.0%)	138 (36.3%)
Any single class antidiabetic drug use	5,589 (32.8%)	5,439 (32.0%)	5,988 (35.2%)	2,816 (34.2%)	76 (37.1%)	112 (29.5%)
Sulfonylureas	1,696 (10.0%)	1,733 (10.2%)	1,864 (11.0%)	1,040 (12.6%)	22 (10.7%)	48 (12.6%)
Metformin	1,171 (6.9%)	1,120 (6.6%)	1,215 (7.1%)	636 (7.7%)	13 (6.3%)	21 (5.5%)
Thiazolidinediones (TZD)	610 (3.6%)	683 (4.0%)	668 (3.9%)	257 (3.1%)	§	12 (3.2%)
Insulin	1,998 (11.7%)	1,787 (10.5%)	2,088 (12.3%)	809 (9.8%)	33 (16.1%)	30 (7.9%)
All others ¹	114 (0.7%)	116 (0.7%)	153 (0.9%)	74 (0.9%)	§	§
Any multiple class antidiabetic drug use	5,757 (33.8%)	3,914 (23.0%)	4,197 (24.7%)	2,014 (24.5%)	13 (6.3%)	16 (4.2%)
Sulfonylureas + Metformin	1,165 (6.8%)	1,008 (5.9%)	1,045 (6.1%)	590 (7.2%)	18 (8.8%)	38 (10.0%)
Sulfonylureas + Metformin + TZD	679 (4.0%)	407 (2.4%)	437 (2.6%)	212 (2.6%)	§	§
Sulfonylureas + TZD	503 (3.0%)	430 (2.5%)	448 (2.6%)	185 (2.3%)	§	§
Metformin + TZD	437 (2.6%)	362 (2.1%)	405 (2.4%)	149 (1.8%)	§	§
Insulin + any other antidiabetic drug(s)	2,618 (15.4%)	1,501 (8.8%)	1,632 (9.6%)	757 (9.2%)	36 (17.6%)	43 (11.3%)
All other combinations	355 (2.1%)	206 (1.2%)	230 (1.4%)	121 (1.5%)	§	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	10,812 (63.5%)	8,562 (50.3%)	8,907 (52.3%)	4,435 (53.9%)	§	§
ACE inhibitors only	6,568 (38.6%)	5,414 (31.8%)	5,644 (33.2%)	2,878 (35.0%)	136 (66.3%)	193 (50.8%)
Angiotensin Receptor Blocker only (ARB)	3,074 (18.1%)	2,726 (16.0%)	2,815 (16.5%)	1,252 (15.2%)	§	§
Both ACE inhibitors + ARBs	1,170 (6.9%)	422 (2.5%)	448 (2.6%)	305 (3.7%)	98 (47.8%)	125 (32.9%)
Antihyperlipidemics (AHL D)						
Any AHL D	10,150 (59.6%)	7,761 (45.6%)	8,474 (49.8%)	3,955 (48.1%)	§	§
Statins	9,351 (54.9%)	7,028 (41.3%)	7,692 (45.2%)	3,586 (43.6%)	25 (12.2%)	52 (13.7%)
Other lipid lowering drugs ²	799 (4.7%)	733 (4.3%)	782 (4.6%)	369 (4.5%)	§	§

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10.

Table 10.1.3 Prevalence of Use of Antidiabetic Medications by Beneficiaries with Diabetes, (Diabetes + Major Depression)

Drug Class	Number and Percent with any Drug Use					
	Study Sample			PDP	MA-PD	
	Full Year Enrollees	First Quarter Enrollees	Fourth Quarter Enrollees	Post January Enrollees	Full Year Enrollees	Post January Enrollees
Total sample size	21,985 (100.0%)	21,985 (100.0%)	21,985 (100.0%)	8,671 (100.0%)	345 (100.0%)	478 (100.0%)
Antidiabetic drugs						
Any antidiabetic drug	15,144 (68.9%)	12,648 (57.5%)	13,679 (62.2%)	5,282 (60.9%)	246 (71.3%)	295 (61.7%)
Any oral antidiabetic drug	8,673 (39.4%)	7,973 (36.3%)	8,331 (37.9%)	3,437 (39.6%)	157 (45.5%)	185 (38.7%)
Any single class antidiabetic drug use	6,972 (31.7%)	6,868 (31.2%)	7,371 (33.5%)	2,795 (32.2%)	113 (32.8%)	137 (28.7%)
Sulfonylureas	1,601 (7.3%)	1,762 (8.0%)	1,732 (7.9%)	789 (9.1%)	37 (10.7%)	44 (9.2%)
Metformin	1,902 (8.7%)	1,774 (8.1%)	1,934 (8.8%)	824 (9.5%)	40 (11.6%)	37 (7.7%)
Thiazolidinediones (TZD)	769 (3.5%)	835 (3.8%)	863 (3.9%)	269 (3.1%)	§	12 (2.5%)
Insulin	2,585 (11.8%)	2,369 (10.8%)	2,707 (12.3%)	869 (10.0%)	28 (8.1%)	43 (9.0%)
All others ¹	115 (0.5%)	128 (0.6%)	135 (0.6%)	44 (0.5%)	29 (8.4%)	§
Any multiple class antidiabetic drug use	8,172 (37.2%)	5,780 (26.3%)	6,308 (28.7%)	2,487 (28.7%)	§	24 (5.0%)
Sulfonylureas + Metformin	1,522 (6.9%)	1,385 (6.3%)	1,400 (6.4%)	639 (7.4%)	18 (5.2%)	43 (9.0%)
Sulfonylureas + Metformin + TZD	974 (4.4%)	647 (2.9%)	658 (3.0%)	276 (3.2%)	§	21 (4.4%)
Sulfonylureas + TZD	584 (2.7%)	549 (2.5%)	561 (2.6%)	211 (2.4%)	§	12 (2.5%)
Metformin + TZD	747 (3.4%)	611 (2.8%)	695 (3.2%)	264 (3.0%)	61 (17.7%)	§
Insulin + any other antidiabetic drug(s)	3,886 (17.7%)	2,306 (10.5%)	2,641 (12.0%)	976 (11.3%)	§	67 (14.0%)
All other combinations	459 (2.1%)	282 (1.3%)	353 (1.6%)	121 (1.4%)	§	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	13,103 (59.6%)	10,523 (47.9%)	11,069 (50.3%)	4,733 (54.6%)	219 (63.5%)	§
ACE inhibitors only	8,630 (39.3%)	7,146 (32.5%)	7,508 (34.2%)	3,046 (35.1%)	§	258 (54.0%)
Angiotensin Receptor Blocker only (ARB)	3,312 (15.1%)	2,909 (13.2%)	3,080 (14.0%)	1,337 (15.4%)	158 (45.8%)	§
Both ACE inhibitors + ARBs	1,161 (5.3%)	468 (2.1%)	481 (2.2%)	350 (4.0%)	§	158 (33.1%)
Antihyperlipidemics (AHL)						
Any AHL	12,561 (57.1%)	9,690 (44.1%)	10,568 (48.1%)	4,260 (49.1%)	37 (10.7%)	§
Statins	11,427 (52.0%)	8,710 (39.6%)	9,540 (43.4%)	3,823 (44.1%)	§	76 (15.9%)
Other lipid lowering drugs ²	1,134 (5.2%)	980 (4.5%)	1,028 (4.7%)	437 (5.0%)	24 (7.0%)	§

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin.

§ Contents suppressed due to cell size ≤ 10.

Table 10.1.4 Prevalence of Use of Antidiabetic Medications by Beneficiaries with Diabetes, (Diabetes + COPD + Major Depression)

Drug Class	Number and Percent with any Drug Use					
	Study Sample			PDP	MA-PD	
	Full Year Enrollees	First Quarter Enrollees	Fourth Quarter Enrollees	Post January Enrollees	Full Year Enrollees	Post January Enrollees
Total sample size	7,428 (100.0%)	7,428 (100.0%)	7,428 (100.0%)	2,362 (100.0%)	27 (100.0%)	59 (100.0%)
Antidiabetic drugs						
Any antidiabetic drug	4,913 (66.1%)	3,962 (53.3%)	4,257 (57.3%)	1,310 (55.5%)	21 (77.8%)	31 (52.5%)
Any oral antidiabetic drug	2,313 (31.1%)	2,225 (30.0%)	2,222 (29.9%)	716 (30.3%)	§	15 (25.4%)
Any single class antidiabetic drug use	2,348 (31.6%)	2,280 (30.7%)	2,455 (33.1%)	737 (31.2%)	§	15 (25.4%)
Sulfonylureas	536 (7.2%)	590 (7.9%)	583 (7.8%)	221 (9.4%)	§	§
Metformin	515 (6.9%)	493 (6.6%)	509 (6.9%)	146 (6.2%)	§	§
Thiazolidinediones (TZD)	225 (3.0%)	267 (3.6%)	252 (3.4%)	69 (2.9%)	§	§
Insulin	1,032 (13.9%)	887 (11.9%)	1,060 (14.3%)	285 (12.1%)	§	§
All others ¹	40 (0.5%)	43 (0.6%)	51 (0.7%)	16 (0.7%)	§	§
Any multiple class antidiabetic drug use	2,565 (34.5%)	1,682 (22.6%)	1,802 (24.3%)	573 (24.3%)	17 (63.0%)	16 (27.1%)
Sulfonylureas + Metformin	357 (4.8%)	303 (4.1%)	316 (4.3%)	105 (4.4%)	§	§
Sulfonylureas + Metformin + TZD	203 (2.7%)	159 (2.1%)	141 (1.9%)	52 (2.2%)	§	§
Sulfonylureas + TZD	140 (1.9%)	136 (1.8%)	132 (1.8%)	48 (2.0%)	§	§
Metformin + TZD	172 (2.3%)	157 (2.1%)	154 (2.1%)	37 (1.6%)	16 (59.3%)	§
Insulin + any other antidiabetic drug(s)	1,568 (21.1%)	850 (11.4%)	975 (13.1%)	309 (13.1%)	§	32 (54.2%)
All other combinations	125 (1.7%)	77 (1.0%)	84 (1.1%)	22 (0.9%)	11 (40.7%)	§
Renin-angiotensin-aldosterone system inhibitors (RAASI)						
Any RAASI	4,603 (62.0%)	3,582 (48.2%)	3,699 (49.8%)	1,195 (50.6%)	§	20 (33.9%)
ACE inhibitors only	3,048 (41.0%)	2,454 (33.0%)	2,553 (34.4%)	788 (33.4%)	§	§
Angiotensin Receptor Blocker only (ARB)	1,057 (14.2%)	963 (13.0%)	976 (13.1%)	295 (12.5%)	§	§
Both ACE inhibitors + ARBs	498 (6.7%)	165 (2.2%)	170 (2.3%)	112 (4.7%)	§	§
Antihyperlipidemics (AHLI)						
Any AHLI	4,138 (55.7%)	3,101 (41.7%)	3,390 (45.6%)	1,045 (44.2%)	§	34 (57.6%)
Statins	3,791 (51.0%)	2,813 (37.9%)	3,058 (41.2%)	943 (39.9%)	17 (63.0%)	31 (52.5%)
Other lipid lowering drugs ²	347 (4.7%)	288 (3.9%)	332 (4.5%)	102 (4.3%)	§	§

Source: CCW 5% file, 2006

¹Alpha-glucosidase inhibitors, exenatide, amylin analog, sitagliptan, and meglitinides.

²Bile acid sequestrants, fibrates, ezetimibe, and niacin

§ Contents suppressed due to cell size ≤ 10

Figure 1 Distribution of Medications Possession Ratio for All Users of Oral Antidiabetic Drugs in 2006.

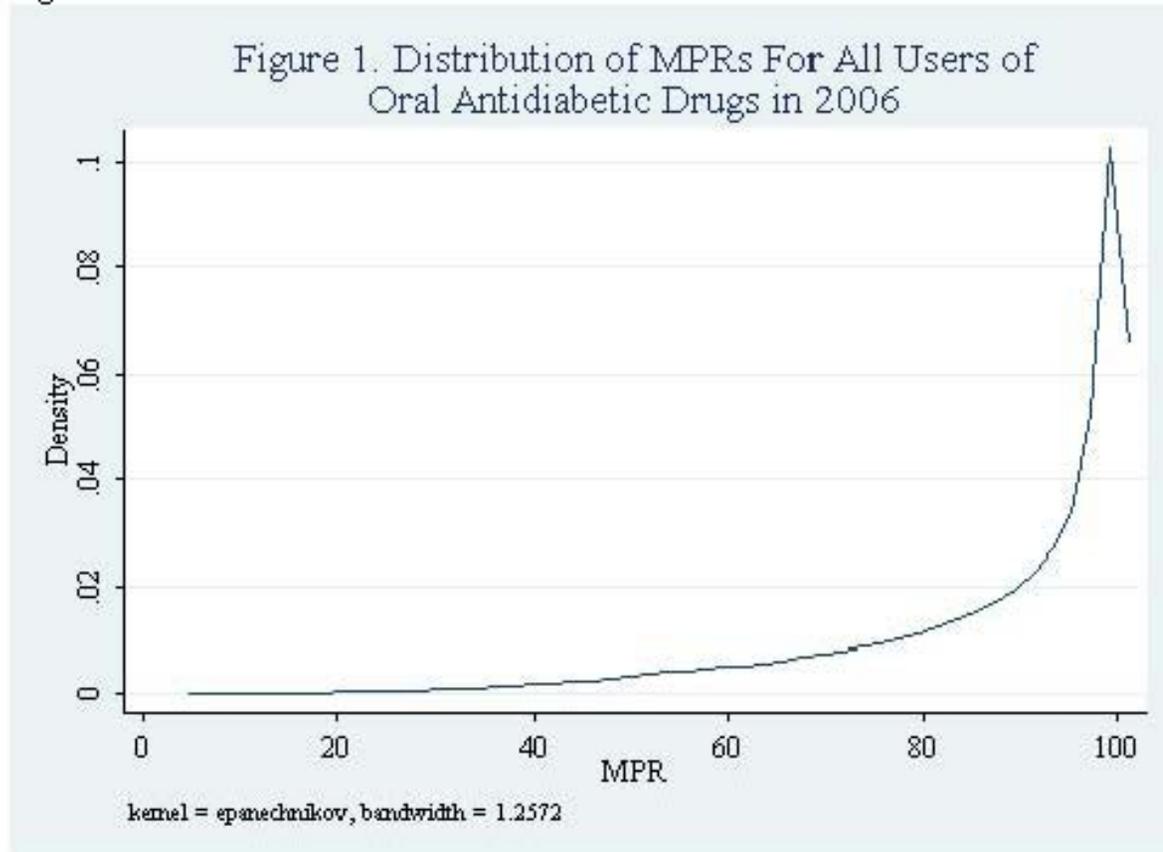


Figure 2 Distribution of Medications Possession Ratio for All Users of Renin-Angiotensin-Aldosterone System Inhibitors in 2006.

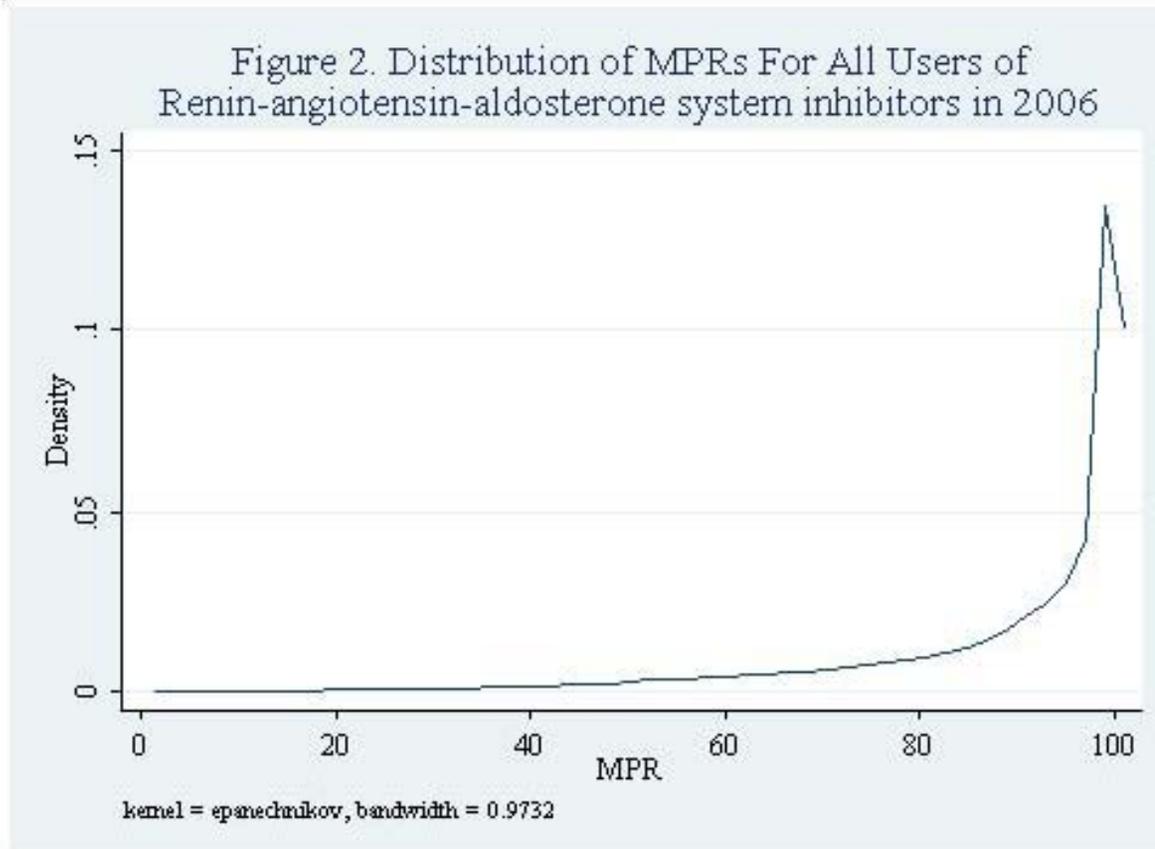


Figure 3 Distribution of Medications Possession Ratio for All Users of Antihyperlipidemics in 2006.

