

Chapter 8:

Prescription Drug Coverage in Patients with CKD

- In this 2018 Annual Data Report (ADR), we introduce new chapter features:
 - Because of the continuing prescription opioid epidemic, this year we retain the section of analgesic use and update the map with non-steroidal anti-inflammatory agents (NSAIDs) and opioid use in the United States using 2016 data.
 - Because of increasing use of high-cost antivirals nationally, this year we specifically investigate the spending and utilization rates of antivirals, including prescription antiretrovirals, nucleosides and nucleotides, and protease inhibitors.
- Approximately 73.7% of chronic kidney disease (CKD) patients enrolled in Medicare Part D in 2016, including both the fee-for-service stand-alone and Medicare Advantage plans. The Part D enrollment rate for the CKD group was slightly higher than in the general Medicare population (69.5%; Figure 8.1).
- The percentage of Medicare beneficiaries who received the Low-income Subsidy (LIS) was higher for CKD patients across all age and race categories than in the general Medicare population (Figures 8.2 and 8.3).
- As compared to White beneficiaries (29.3%), much higher proportions of Asian (73.8%) and Black/ African American (62.8%) CKD Part D beneficiaries qualified for the LIS (Figure 8.3).
- Among patients with stand-alone Part D plans, per person per year (PPPY) insurance spending on prescriptions was 1.6 times higher for Medicare patients with CKD than for general beneficiaries (\$4,941 vs. \$3,027) in 2016. Spending for CKD patients with Medicare Advantage plans was 1.6 times higher (\$2,926, vs. \$1,834), and 4.1 times higher for those with managed care coverage (\$4,164 vs. \$1,013; Figure 8.5.a).
- Total spending for Part D-covered medications in 2016 was more than twice as high for patients with the LIS than for those without, regardless of the presence of CKD. Patient out-of-pocket costs for LIS patients represented only a 1.2-1.3% share of these total expenditures, as compared to 25.3-27.0% in each of the non-LIS populations (Figure 8.5.b).
- Prescriptions for lipid-lowering agents, antibacterials, renin-angiotensin-aldosterone system inhibitors, and β -adrenergic blocking agents (beta blockers) were each filled by more than 50% of Medicare CKD patients during 2016 (Table 8.6). CKD patients with Medicare Advantage and managed care coverage showed similar patterns of use for these drug classes.
- By drug class, the highest medication expenditures for patients with CKD were for antidiabetic agents, followed by antineoplastic agents, antivirals, and lipid-lowering agents (Table 8.7).
- In the United States (U.S.), the overall proportion of CKD patients using prescription NSAIDs and opioids were 16.4% and 43.8%, respectively (Figure 8.6-8.7).
- In 2016, approximately 5.0% of Medicare CKD patients had at least one filled prescription antiviral, and PPPY Medicare Part D spending among these users is \$5,421 (Figure 8.9-8.10).

Introduction

Pharmaceutical therapy serves as a critical part of CKD treatment to control and reduce complications and delay disease progression. This chapter assesses prescription drug coverage, prescription drug-related costs, and patterns of prescription drug use for CKD patients in three health systems. The Medicare 5% sample is used to describe Part D enrollment patterns in Medicare beneficiaries and Medicare Part D spending under stand-alone prescription drug plans (PDPs). Beginning from the 2017 ADR (USRDS, 2017) we have added information on prescription drug use and associated costs from the Optum Clinformatics™ DataMart (obtained from OptumInsight) for persons with Medicare Advantage and managed care coverage.

In 2016, 45% of general Medicare beneficiaries enrolled in a stand-alone PDP, while 25% received coverage through a Medicare Advantage plan (Kaiser, 2018); adding information for Medicare Advantage beneficiaries thus makes our assessment of prescription drug use in CKD more complete. Additionally, Optum Clinformatics™ data for beneficiaries with managed care complements our report by providing insight into a younger and employed population.

Starting in 2017, we annually select a different drug class for a more detailed investigation of medication use patterns. In the 2017 ADR, we reported analgesics used by CKD patients. Because of the continuing opioid epidemic, we continue that analysis this year, but we have also added a section on prescription antivirals, a category with high and growing costs.

A parallel examination of prescription drug use and associated costs in patients with end-stage (ESRD) can be found in Volume 2, Chapter 10: [Prescription Drug Coverage in Patients with ESRD](#).

Methods

In this chapter, we examine the Medicare 5% sample data to describe Part D enrollment and prescription utilization for Medicare beneficiaries. Enrollment data are available for both traditional Medicare (fee-for-service) enrollees and Medicare Advantage enrollees; however, actual claim data and

spending data are only available for beneficiaries with traditional Medicare. Thus, our past estimations for Part D enrollment applied to all Medicare beneficiaries, but the reporting of prescription utilization and associated costs applied only to the sub-group of Medicare fee-for-services Part D enrollees. We have now introduced Optum Clinformatics™ data to augment our assessment of prescription utilization and associated costs for both the Medicare Advantage population and a commercially insured, managed care population.

Details of these data are described in the [Data Sources](#) section of the [CKD Analytical Methods](#) chapter. See the section on [Chapter 8](#) in the [CKD Analytical Methods](#) chapter for an explanation of the analytical methods used to generate the study cohorts, figures, and tables in this chapter. Downloadable Microsoft Excel and PowerPoint files containing the data and graphics for these figures and tables are available on the [USRDS website](#).

To be included in analyses specific to the Medicare 5% population, eligible beneficiaries must have been enrolled in traditional Medicare for all of the one-year entry period (year one, the calendar year before the year reported in the figures and tables), and be alive, without ESRD, and enrolled in Medicare on January 1 of the reported year (year two). These criteria were necessary to enable CKD identification, as diagnosis codes were not available for patients before they became eligible for fee-for-service Medicare. CKD patients were identified by having a minimum of one inpatient and/or two outpatient CKD diagnoses claims in year one. We assessed Part D enrollment and prescription utilization for year two. The Medicare Part D drug event file provided data to evaluate prescription utilization; it contains records of all prescriptions filled by the beneficiaries under Medicare Part D.

For beneficiaries selected from the Optum Clinformatics™ data, to create comparable results we applied the same eligibility algorithm as for the Medicare population. Beneficiaries were required to be in the Optum Clinformatics™ dataset throughout year one, be alive, without ESRD, and covered by either a Medicare Advantage plan or a managed care plan on January 1 of year two. Those with Medicare

Advantage at the beginning of year two were classified as the Medicare Advantage population; otherwise, they were classified as the managed care population. All beneficiaries in the Optum Clinformatics™ dataset had prescription drug coverage.

In this chapter, we define spending as insurance plan payments. For example, Medicare Part D spending is the sum of Medicare net payment and the Low-income Supplement (LIS) amount. Patients' obligations (out-of-pocket costs) are the sum of the deductible and copayment.

Medicare Part D Coverage Plans

The optional Medicare Part D prescription drug benefit has been available to all beneficiaries since 2006. Part D benefits can be managed through a stand-alone PDP or through a Medicare Advantage plan. Most Medicare Advantage plans offer prescription drug coverage (Medicare Advantage prescription drug plan, MA-PD). CKD patients have the option to enroll in a Medicare Advantage plan; end-stage renal disease (ESRD) patients, in contrast, are precluded from entering a Medicare Advantage plan if they are not already enrolled in one when they reach ESRD.

Before 2006, Medicare beneficiaries obtained drug coverage through various avenues—insurance plans, state Medicaid programs, pharmaceutical assistance programs, or samples received from physicians. Those with none of these options paid for their medications out-of-pocket. Beneficiaries with low income who were dually enrolled in Medicare and Medicaid

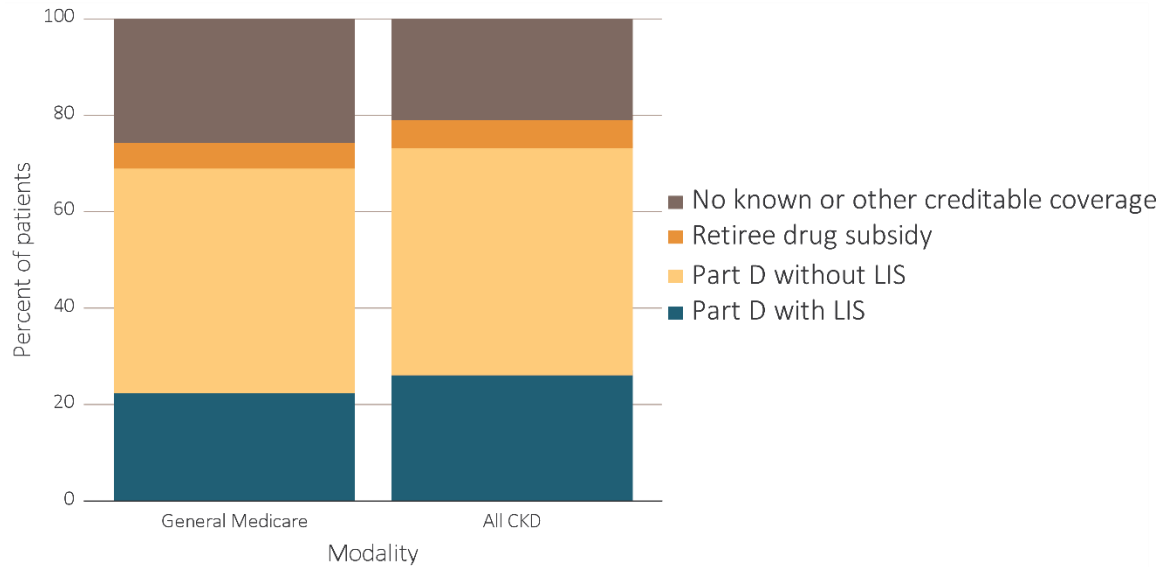
received prescription benefits under state Medicaid programs.

After 2006, the majority of Medicare enrollees obtained Part D coverage. The Part D program offers a substantial Low-income Subsidy (LIS) benefit to enrollees with limited assets and income, including those dually enrolled. The LIS provides full or partial waivers for many out-of-pocket cost-sharing requirements, including premiums, deductibles, and copayments, and provides full or partial coverage during the Part D coverage gap (commonly referred to as the “donut hole”).

Besides Medicare Part D plans (PDP and MA-PD), Medicare beneficiaries can choose instead to obtain outpatient medication benefits through retiree drug subsidy plans or other creditable coverage such as employer group health plans, other private coverage, or Veterans Health Administration (VHA) benefits. Some enrollees remain uninsured and pay out-of-pocket for their outpatient prescription medications. The premiums for Part D coverage are partially subsidized. Beneficiaries who delay voluntary enrollment, yet lack other creditable coverage at least equivalent to Part D, pay higher premiums once they do enroll.

In 2016, approximately 73.7% of CKD patients enrolled in Medicare Part D (including both stand-alone and Medicare Advantage plans). This rate was slightly higher than Part D enrollment by those in the general Medicare population (69.5%, Figure 8.1). Compared to Part D enrollees in the general population, a higher percentage of CKD patients qualified for the LIS (26.6% vs. 22.8%).

vol 1 Figure 8.1 Sources of prescription drug coverage in Medicare enrollees, by population, 2016



Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1, 2016. Abbreviations: CKD, chronic kidney disease; LIS, Medicare Low-income Subsidy; Part D, Medicare prescription drug coverage benefit.

The proportion of beneficiaries that enrolled in Medicare Part D rose between 2011 and 2016, among both general Medicare beneficiaries and patients with

CKD (Table 8.1). In each year, enrollment was slightly higher for those with CKD than in the general Medicare population.

vol 1 Table 8.1 General Medicare and CKD patients enrolled in Part D

	General Medicare (%)	All CKD (%)
2011	55.7	59.3
2012	57.6	60.5
2013	65.7	69.3
2014	66.3	71.1
2015	67.1	71.9
2016	69.5	73.7

Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

The Centers for Medicare & Medicaid Services (CMS) provides prescription drug plans (PDPs) with guidance on structuring a “standard” Part D PDP. The upper portion of Table 8.2 shows the standard benefit design for PDPs in 2011 and 2016. In 2016, for example, beneficiaries shared costs with the PDP as co-insurance or copayments, until the combined total during the initial coverage period reached \$3,310. After reaching this level, beneficiaries entered the coverage gap (“donut hole”) where they paid 100% of prescription costs. Under the original Affordable Care Act, the coverage gap in the Part D benefit will be phased out by 2020.

As part of the phase-out, the government began providing non-LIS recipients reaching the coverage gap with increasing assistance each year. In 2016, beneficiaries received a 50% discount on brand name drugs from manufacturers plus 5% coverage from their Part D plans; plans also paid 42% of generic drug costs in the gap. Beneficiaries who had paid yearly out-of-pocket drug costs of \$4,850 reached the catastrophic coverage phase, in which they then had only a small copayment for their drugs until the end of the year.

PDPs have the latitude to structure their plans differently than the model presented here; companies offering non-standard plans must show that their coverage is at least actuarially equivalent to the standard plan. Many have developed plans with no deductibles or with drug copayments instead of the 25% co-insurance, and some plans provide generic and/or brand name drug coverage during the coverage gap.

Part D does not cover all medications prescribed for Medicare enrollees. Several drug categories—such as over-the-counter medications, anorexia and weight loss or gain medications, prescription vitamins (except for prenatal vitamins), and cough and cold medications are excluded from the Part D program formulary. This creates a lack of support for some drugs commonly prescribed to treat CKD, including oral iron, ergocalciferol, and cholecalciferol. In January 2013, Medicare expanded Part D coverage to include benzodiazepines without restriction, and barbiturates when prescribed for specific indications.

vol 1 Table 8.2 Medicare Part D parameters for defined standard benefit, 2011 & 2016

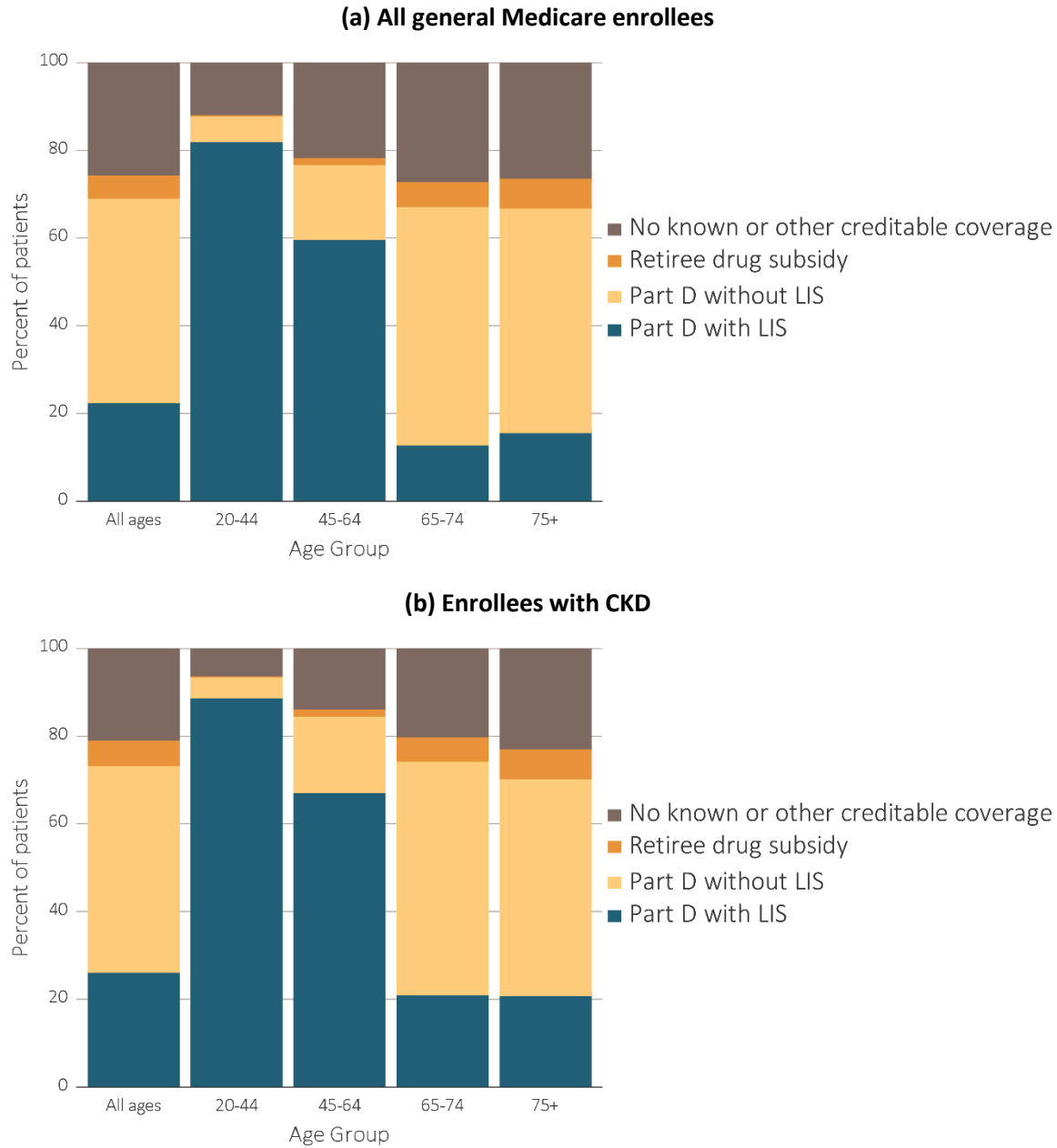
	2011	2016
Deductible	\$310	\$360
After the deductible is met, the beneficiary pays 25% of total prescription costs up to the initial coverage limit.		
Initial coverage limit	\$2,840	\$3,310
The coverage gap (“donut hole”) begins at this point. The beneficiary pays 100% of their prescription costs up to the out-of-pocket threshold		
Out-of-pocket threshold	\$4,550	\$4,850
The total out-of-pocket costs including the “donut hole”		
Total covered Part D prescription out-of-pocket spending	\$6,448	\$7,063
Catastrophic coverage begins after this point (including the coverage gap) ^a		
Catastrophic coverage benefit	\$2.50	\$2.95
Generic/preferred multi-source drug	\$6.30	\$7.40
2016 Example:		
\$360 (deductible)	\$310	\$360
+(((\$3,310-\$360)*25%)(initial coverage)	\$633	\$738
+(((\$7,063-\$3,310)*100%)(coverage gap)	\$3,608	\$3,753
Total	\$4,550	\$4,850
(maximum out-of-pocket costs prior to catastrophic coverage, excluding plan premium)		

Data source: Table adapted from <http://www.q1medicare.com/PartD-The-2016-Medicare-Part-D-Outlook.php>. Medicare Part D Enrollment Patterns. ^aThe catastrophic coverage amount is the greater of 5% of medication cost or the values shown in the chart above. In 2016, beneficiaries were charged \$2.95 for those generic or preferred multisource drugs with a retail price less than \$59 and 5% for those with a retail price over \$59. For brand name drugs, beneficiaries paid \$7.4 for those drugs with a retail price less than \$148 and 5% for those with a retail price over \$148. In 2016, beneficiaries received a 50% discount on brand name drugs from manufacturers plus 5% coverage from their Part D plans; plans also paid 42% of generic drug costs in the gap. Abbreviation: Part D, Medicare prescription drug coverage benefit.

Among both general Medicare beneficiaries and those with CKD, the percentage of beneficiaries enrolled in Part D generally declined with age (Figure 8.2). The proportion of beneficiaries with LIS declined

with age in both populations, with the exception of general Medicare population aged 75 and older. CKD patients in all age categories were more likely to receive this subsidy.

vol 1 Figure 8.2 Sources of prescription drug coverage in Medicare enrollees, by age, 2016

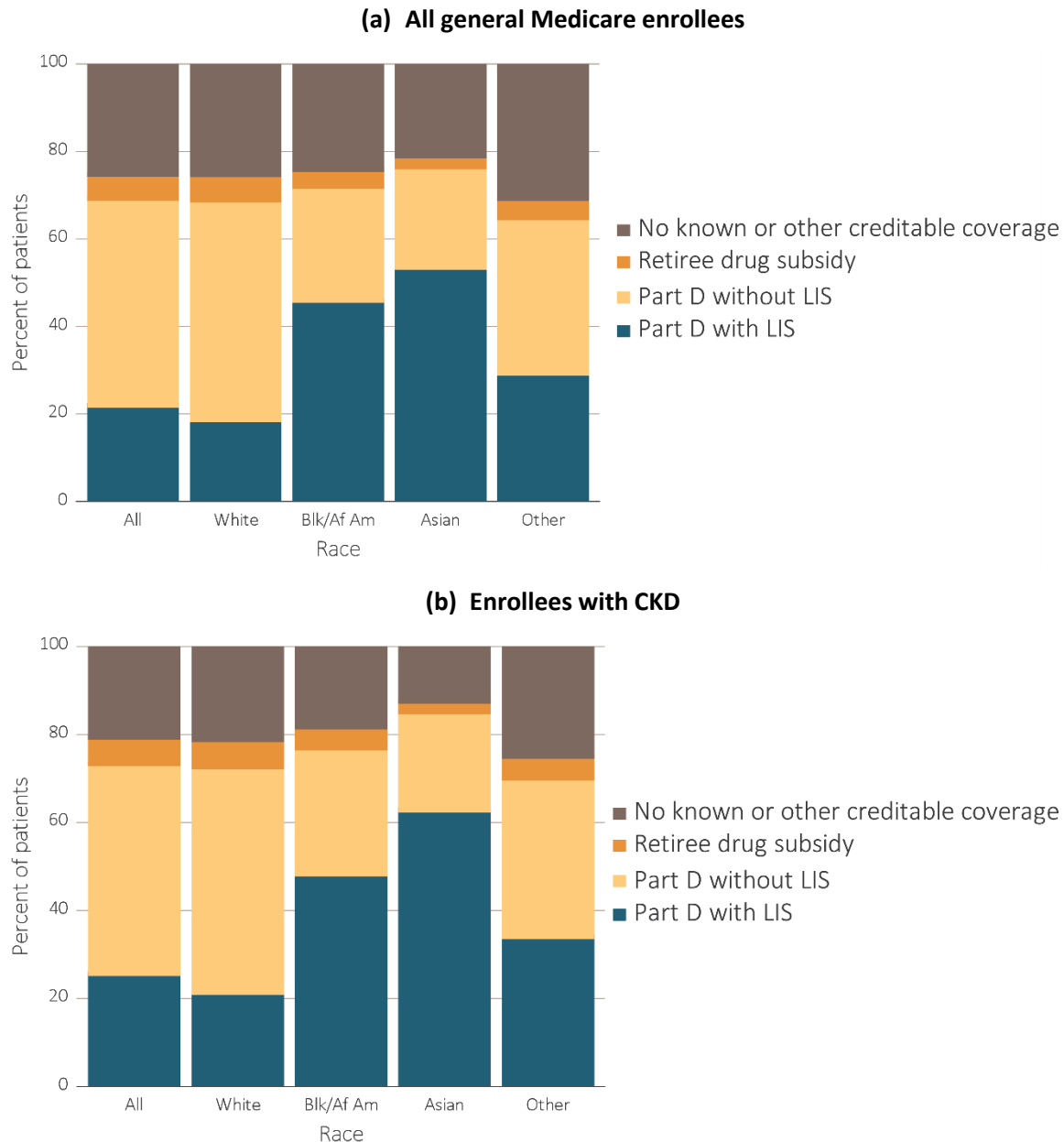


Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1, 2016. Abbreviations: CKD, chronic kidney disease; LIS, Medicare Low-income Subsidy; Part D, Medicare prescription drug coverage benefit.

Patterns of coverage by race were similar for both general Medicare beneficiaries and for those with CKD (Figure 8.3). The percentage of beneficiaries with the LIS was higher for CKD patients than their general Medicare counterparts. Table 8.3 reports the percentage of general Medicare and CKD enrollees who were eligible for the LIS, stratified by both age and race. Among Medicare Part D enrollees with CKD, 73.8% of Asian beneficiaries received the LIS,

compared to 62.8% of Blacks, and 29.3% of Whites. Although Asian Americans of all ages overall have higher incomes and lower poverty rates, the Administration for Community Living (ACL) and Administration on Aging (AoA) reports in 2015 that the poverty rate of Asians over 65 in the United States is higher than among all older adults, and a higher percent of elderly Asians were covered by both Medicare and Medicaid (ACL, 2015).

vol 1 Figure 8.3 Sources of prescription drug coverage in Medicare enrollees, by race, 2016



Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1, 2016. Abbreviations: Blk/Af Am, Black/African American; CKD, chronic kidney disease; LIS, Medicare Low-income Subsidy; Part D, Medicare prescription drug coverage benefit.

vol 1 Table 8.3 Medicare Part D enrollees with the Low-income Subsidy, by age & race, 2016

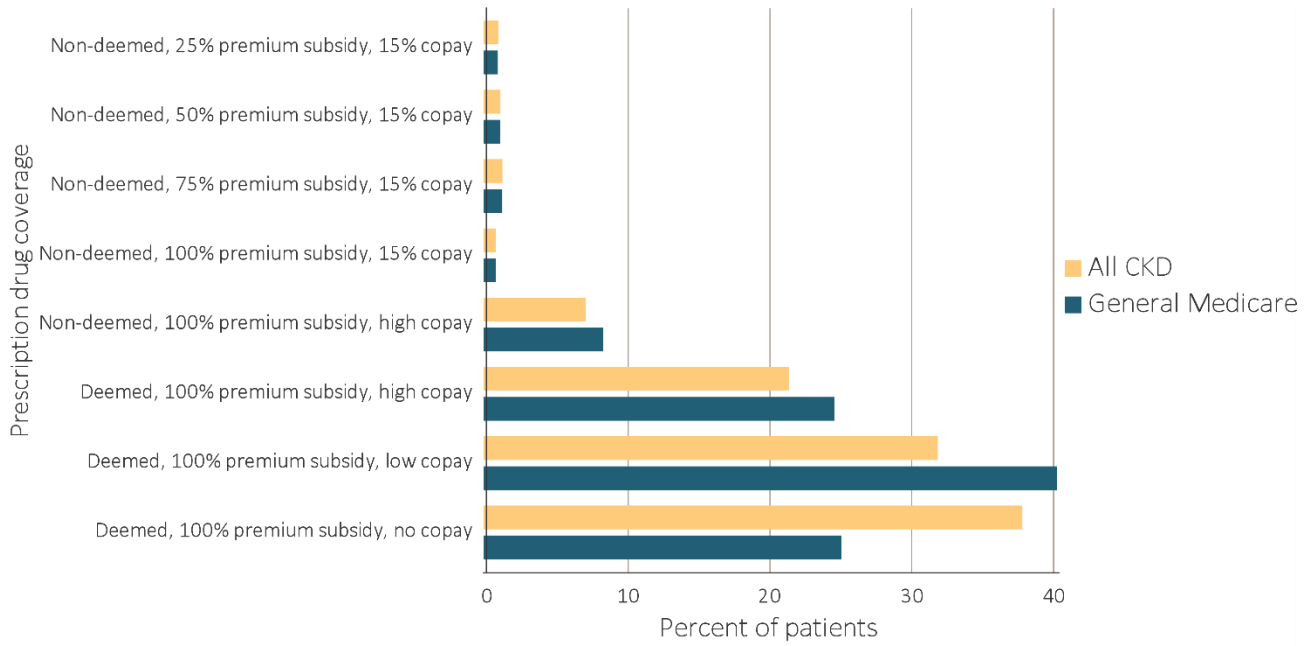
	General Medicare (%)	All CKD (%)
	Part D with Low-income Subsidy	Part D with Low-income Subsidy
All	32.9	36.1
White		
All ages	27.0	29.3
20-44	92.4	94.2
45-64	75.4	76.8
65-74	15.1	23.2
75+	18.8	23.7
Black/African American		
All ages	63.8	62.8
20-44	95.2	96.6
45-64	85.4	85.5
65-74	44.8	50.5
75+	52.7	58.2
Asian		
All ages	70.0	73.8
20-44	93.1	93.1
45-64	85.3	84.1
65-74	60.0	63.8
75+	73.9	77.2
Other races		
All ages	45.2	48.5
20-44	94.9	96.5
45-64	80.6	81.9
65-74	30.4	35.3
75+	39.8	47.7

Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1, 2016. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

Several categories of Medicare beneficiaries automatically qualify for LIS and Part D benefits, and are considered to be ‘deemed’. These individuals include full-benefit Medicare/Medicaid dual eligible individuals, partial dual eligible individuals, Qualified Medicare Beneficiaries (QMB-only), Specified Low-income Medicare Beneficiaries (SLMB-only), Qualifying Individuals (QI), and people who receive Supplemental Security Income (SSI) benefits but not Medicaid. Other Medicare beneficiaries with limited incomes and resources who do not automatically qualify for LIS (non-deemed) can apply for LIS and have their eligibility determined by their State Medicaid agency or the Social Security Administration.

Figure 8.4 illustrates the distribution of Part D enrollees receiving the LIS across the benefit categories of premium subsidy and copayment. The largest group of LIS recipients who had CKD was eligible for a full premium subsidy—21.1% had a high copay, 31.6% had a low copay, and 37.6% had no copay.

vol 1 Figure 8.4 Distribution of Low-income Subsidy categories in Part D general Medicare and CKD patients, 2016



Data source: Medicare 5% sample. Point prevalent Medicare enrollees alive on January 1, 2016. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

Spending for Prescriptions

In 2016, Medicare Part D spending for fee-for-service beneficiaries reached \$56.9 billion. Table 8.4 represents the sum of the Medicare covered amount and the LIS amount. Medicare Part D spending for beneficiaries with CKD was \$11.8 billion—about 20.8% of overall Medicare Part D spending. Data over a six-year period shows a consistent trend of increasing costs; between 2011 and 2016 spending rose by 42.0% for general Medicare patients (\$16.8 billion) and

129.6% for Medicare CKD patients (\$6.7 billion). This increase mirrors the increase of CKD ascertainment and the increase in Medicare part D spending per capita in the same period. Per capita spending for general Medicare increased by 12.6% during this five year interval compared to a 24.2% increase among CKD patients. ESRD patients also had higher than average increases during these years (see Volume 2, Chapter 10: [Prescription Drug Coverage in Patients with ESRD](#)).

vol 1 Table 8.4 Total estimated Medicare Part D spending for fee-for-service beneficiaries, 2011-2016

Year	General Medicare		All CKD	
	Medicare spending (in billions)	Medicare spending / PPPY	Medicare spending (in billions)	Medicare spending / PPPY
2011	\$40.1	\$2,689	\$5.2	\$3,978
2012	\$35.7	\$2,610	\$4.8	\$3,918
2013	\$45.7	\$2,584	\$6.8	\$3,947
2014	\$50.5	\$2,806	\$7.7	\$4,229
2015	\$54.2	\$2,970	\$8.7	\$4,545
2016	\$56.9	\$3,027	\$11.8	\$4,941

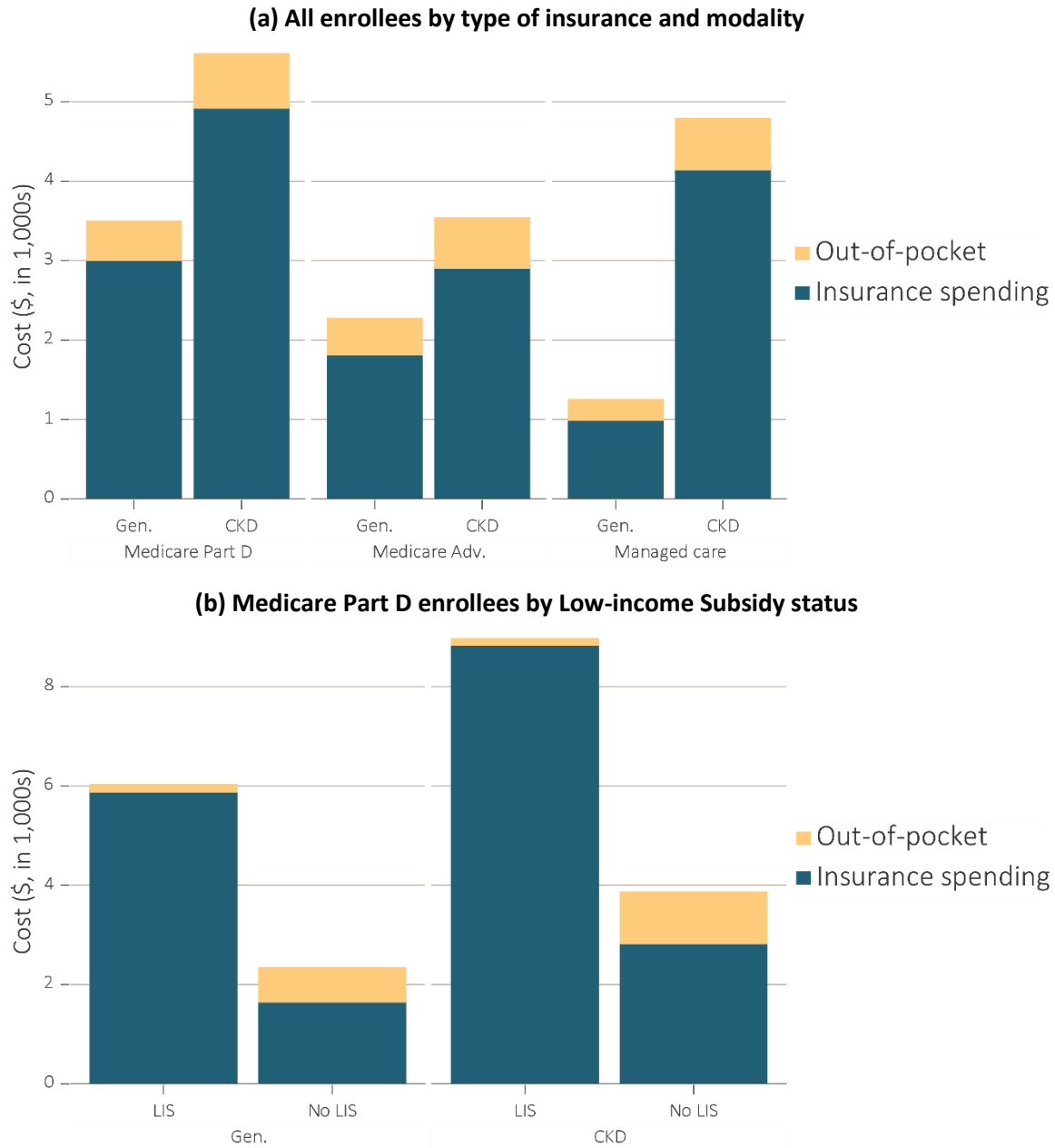
Data source: Medicare Part D claims. Medicare totals include Part D claims for Part D enrollees with traditional Medicare (Parts A & B). CKD totals include Medicare CKD patients, as determined from claims. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit; PPPY, per person per year.

Figure 8.5.a illustrates PPPY spending and patient out-of-pocket costs by type of coverage. In 2016, PPPY insurance spending for CKD beneficiaries was 1.6, 1.6, and 4.1 times higher than for general beneficiaries of the Medicare Part D, Medicare Advantage, and managed care cohorts. Similar to patterns of spending, out-of-pocket costs for CKD patients were 1.5, 1.4, and 2.8 times higher than for general populations with Medicare Part D, Medicare Advantage, and managed care coverage. Out-of-pocket costs represented a larger share of total prescription spending in the general Medicare Advantage cohort (18.6%), the general managed care cohort (17.8%) and the CKD Medicare Advantage cohort (16.8%) than in the

general Medicare Part D cohort (13.0%), the CKD managed care cohort (12.7%) and the CKD Medicare Part D cohort (11.9%).

Per person per year spending for general and CKD Medicare Part D enrollees was further stratified by their LIS status (Figure 8.5.b). Total 2016 spending for Part D-covered medications was more than twice as high for beneficiaries with the LIS than for those without, regardless of the presence of CKD. In the LIS populations, however, out-of-pocket costs represented only 1.2-1.3% of these total expenditures, compared to 25.3-27.0% in each of the non-LIS populations.

vol 1 Figure 8.5 Per person per year insurance & out-of-pocket costs (in \$1,000s) for enrollees, 2016



Data source: Medicare Part D claims and Optum Clinformatics™ claims. Medicare totals include Part D claims for Part D enrollees with traditional Medicare (Parts A & B). CKD totals include Medicare CKD patients as determined from claims. Costs are per person per year for calendar year 2016. Medicare total is the sum of Medicare net payment plus Low-income Supplement amount. Abbreviations: Gen., general enrollees; CKD, chronic kidney disease; LIS, Medicare Low-income Subsidy; Medicare adv., Medicare Advantage plans; Part D, Medicare prescription drug coverage benefit.

PPPY Medicare Part D spending for prescriptions (excluding patient obligations) varied widely by coverage (Table 8.5). Overall, expenditures for beneficiaries with CKD were higher than in the general populations. PPPY insurance spending for prescriptions was highest in Medicare Part D beneficiaries with LIS for both the general and CKD populations (\$5,916 and \$8,870). For the general population cohorts, spending was lowest in managed care (\$1,013), and for the CKD cohorts was lowest in

Medicare Part D without LIS (\$2,861). For both general Medicare, and CKD Medicare, LIS per capita spending was over 3 times as great as for non-LIS patients. Reasons for this difference have yet to be determined.

As there are differences between the Medicare and Optum Clinformatics™ beneficiary populations and in their methods of reporting costs, these results may not be directly comparable and should be interpreted with caution and with understanding of those differences.

vol 1 Table 8.5 Per person per year insurance spending (\$) for enrollees, 2016

	(a) Medicare Part D			
	Medicare Part D with LIS, General	Medicare Part D with LIS, CKD	Medicare Part D without LIS, General	Medicare Part D without LIS, CKD
Age				
All	\$5,916	\$8,870	\$1,684	\$2,861
20-44	\$5,757	\$12,015	\$3,000	\$2,921
45-64	\$7,883	\$12,742	\$3,806	\$5,828
65-74	\$5,171	\$9,010	\$1,614	\$3,374
75+	\$4,317	\$6,254	\$1,550	\$2,356
Sex				
Male	\$5,900	\$9,407	\$1,830	\$3,087
Female	\$5,926	\$8,536	\$1,576	\$2,633
Race				
White	\$6,119	\$9,063	\$1,670	\$2,827
Black/African American	\$5,779	\$8,579	\$1,968	\$2,952
Asian	\$4,973	\$7,541	\$1,346	\$2,716
Other race	\$5,016	\$7,931	\$1,768	\$3,611
	(b) Medicare Advantage and Managed Care			
	Medicare Advantage, General	Medicare Advantage, CKD	Managed Care, General	Managed Care, CKD
Age				
All	\$1,834	\$2,926	\$1,013	\$4,164
20-44	\$5,149	\$9,767	\$579	\$2,566
45-64	\$5,045	\$7,862	\$1,323	\$4,480
65-74	\$1,610	\$3,401	\$2,087	\$5,134
75+	\$1,438	\$2,211	\$2,623	\$3,772
Sex				
Male	\$1,812	\$2,892	\$986	\$4,401
Female	\$1,850	\$2,954	\$1,040	\$3,850
Race				
White	\$1,851	\$2,880	\$1,045	\$4,260
Black/African American	\$2,761	\$4,159	\$982	\$3,993
Asian	\$1,765	\$3,213	\$597	\$3,234
Other race	NA	NA	NA	NA

Data source: Medicare Part D claims and Optum Clinformatics™ claims. CKD determined from claims. Costs are per person per year for calendar year 2016. Medicare PPPY is the sum of Medicare net payment and the Low-income Supplement amount. LIS status is determined from the Part D enrollment. A person is classified as LIS if they are eligible for the LIS for at least one month during 2016. Abbreviations: CKD, chronic kidney disease; LIS, Medicare Low-income Subsidy; NA, not applicable; Part D, Medicare prescription drug coverage benefit.

Prescription Drug Classes

Ranking of the top 15 prescription drug classes used by CKD patients is based on the percentage of beneficiaries with at least one claim for a medication in that class during 2016. The proportion of patients using each drug class was somewhat lower for Medicare Advantage and managed care enrollees in the Optum Clinformatics™ database than for those having Medicare Part D. These differences could arise

from plan effects such as coverage or care management activities, or from patient selection in the younger and healthier Optum Clinformatics™ cohort. The most commonly used drug classes were similar between the different cohorts. The list was led by lipid-lowering agents, antibacterials, renin-angiotensin-aldosterone system inhibitors, β -adrenergic blocking agents (Beta Blockers), and analgesics and antipyretics (Table 8.6).

vol 1 Table 8.6 Top 15 drug classes received by CKD cohorts in different health plans, by percent of patients, 2016

(a) Medicare Part D		
Rank	Drug class	Percent of patients
1	Lipid-lowering agents	65.2%
2	Antibacterials	60.2%
3	Renin-angiotensin-aldosterone system Inhibitors	59.2%
4	β -adrenergic blocking agents	54.6%
5	Analgesics and antipyretics	49.5%
6	Diuretics	46.0%
7	Antiulcer agents and acid suppressants	42.3%
8	Antidiabetic agents	42.1%
9	Calcium-channel blocking agents	38.0%
10	Psychotherapeutic agents	37.6%
11	Antithrombotic agents	31.1%
12	Anticonvulsants	27.7%
13	Thyroid and antithyroid agents	25.5%
14	Anxiolytics, sedatives, and hypnotics	23.3%
15	Adrenals	22.1%

(b) Medicare Advantage		
Rank	Drug class	Percent of patients
1	Lipid-lowering agents	53.0%
2	Renin-angiotensin-aldosterone system	50.4%
3	Antibacterials	44.3%
4	β -adrenergic blocking agents	40.6%
5	Analgesics and antipyretics	36.7%
6	Diuretics	33.4%
7	Calcium-channel blocking agents	31.2%
8	Antiulcer agents and acid suppressants	30.3%
9	Antidiabetic agents	29.8%
10	Psychotherapeutic agents	26.3%
11	Antithrombotic agents	21.1%
12	Vaccines	20.4%
13	Diabetic consumables	19.5%
14	Thyroid and antithyroid agents	18.8%
15	Anticonvulsants	18.3%

Table 8.6 continued on next page.

vol 1 Table 8.6 Top 15 drug classes received by CKD cohorts in different health plans, by percent of patients, 2016 (continued)

(c) Managed Care

Rank	Drug class	Percent of patients
1	Antibacterials	48.5%
2	Renin-angiotensin-aldosterone system	48.2%
3	Lipid-lowering agents	45.0%
4	Analgesics and antipyretics	41.8%
5	β-adrenergic blocking agents	31.2%
6	Antidiabetic agents	30.6%
7	Calcium-channel blocking agents	24.6%
8	Diuretics	23.8%
9	Psychotherapeutic agents	23.7%
10	Antiulcer agents and acid suppressants	20.6%
11	Adrenals	18.9%
12	Anxiolytics, sedatives, and hypnotics	18.7%
13	Diabetic consumables	18.0%
14	Anticonvulsants	15.4%
15	Thyroid and antithyroid agents	14.2%

Data source: Medicare Part D claims and Optum Clinformatics™ claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample. Diabetic Consumables refers to blood glucose test strips, blood glucose meters/sensors, lancets, needles, pen needles etc. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

For the CKD Medicare Part D cohort, antidiabetic agents required the greatest spending, at 23.5% of the total for this group. For the Medicare Advantage and managed care cohorts, antidiabetic agents accounted for 18.9% and 23.2% of total spending. Other costly medications include antineoplastic agents, antivirals, and lipid-lowering agents (Table 8.7).

For an examination of the prevalence of cardiovascular agent use among Medicare beneficiaries, see Volume 1, Chapter 4: [Cardiovascular Disease in Patients with CKD](#). This chapter includes comparisons by cardiovascular comorbidities, procedures, and CKD status.

vol 1 Table 8.7 Top 15 drug classes received by different CKD cohorts (Medicare Part D/Medicare Advantage programs/Managed Care health plans), by insurance spending, 2016

(a) Medicare Part D			
Rank	Drug class	Spending (\$ in millions)	Percent of total spending
1	Antidiabetic agents	2787	23.5%
2	Antineoplastic agents	1367	11.5%
3	Antivirals	664	5.6%
4	Lipid-lowering agents	541	4.6%
5	Antithrombotic agents	462	3.9%
6	Psychotherapeutic agents	447	3.8%
7	Anticonvulsants	343	2.9%
8	Anti-inflammatory agents	338	2.9%
9	Analgesics and antipyretics	319	2.7%
10	Antiulcer agents and acid	274	2.3%
11	Disease-modifying antirheumatic agents	256	2.2%
12	Anticholinergic agents	219	1.9%
13	Vasodilating agents (respiratory tract)	202	1.7%
14	Central nervous system agents, miscellaneous	185	1.6%
15	Antibacterials	182	1.5%

(b) Medicare Advantage			
Rank	Drug class	Spending (\$ in millions)	Percent of total spending
1	Antidiabetic agents	210	18.9%
2	Antineoplastic agents	126	11.3%
3	Lipid-lowering agents	71	6.4%
4	Antivirals	49	4.5%
5	Antithrombotic agents	49	4.4%
6	Diabetes consumables	48	4.3%
7	Anti-inflammatory agents	36	3.3%
8	Psychotherapeutic agents	34	3.0%
9	Analgesics and antipyretics	29	2.7%
10	Anticonvulsants	28	2.6%
11	Renin-angiotensin-aldosterone system inhibitors	24	2.2%
12	Anticholinergic agents	24	2.1%
13	Disease-modifying antirheumatic agents	22	2.0%
14	Antiulcer agents and acid	21	1.9%
15	Vasodilating agents	19	1.7%

Table 8.7 continued on next page.

vol 1 Table 8.7 Top 15 drug classes received by different CKD cohorts (Medicare Part D/Medicare Advantage programs/Managed Care health plans), by insurance spending, 2016 (continued)

(c) Managed Care

Rank	Drug class	Spending (\$ in millions)	Percent of total spending
1	Antidiabetic agents	72	23.2%
2	Antineoplastic agents	43	14.0%
3	Antivirals	23	7.3%
4	Disease-modifying antirheumatic agents	16	5.1%
5	Lipid-lowering agents	15	5.0%
6	Antithrombotic agents	11	3.4%
7	Analgesics and antipyretics	9	2.7%
8	Psychotherapeutic agents	8	2.4%
9	Diabetic consumables	7	2.3%
10	Anticonvulsants	6	1.8%
11	Anti-inflammatory agents	6	1.8%
12	Immunomodulatory agents	5	1.7%
13	Renin-angiotensin-aldosterone system inhibitors	5	1.6%
14	Antibacterials	5	1.5%
15	Skin and mucous membrane agents, miscellaneous	4	1.4%

Data source: Medicare Part D claims and Optum Clinformatics™ claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample. Medicare Part D spending represents the sum of the Medicare covered amount and the Low-income Subsidy amount. Diabetic Consumables refers to blood glucose test strips, blood glucose meters/sensors, lancets, needles, pen needles etc. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

Medications for Pain Management

CKD patients often experience pain, yet the various medications for pain have different drawbacks. Non-steroidal anti-inflammatory drugs (NSAIDs) may induce renal function abnormalities and opioid abuse has been a growing national problem.

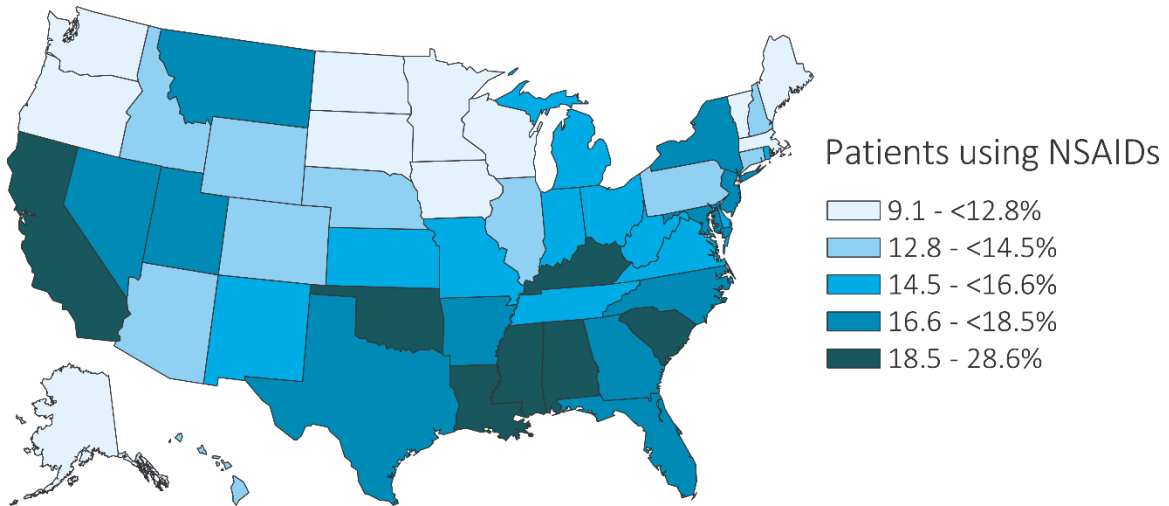
NSAIDs and opioid analgesics are two of the primary drug classes used for pain management. Figures 8.6 and 8.7 display the state-specific proportion of CKD Medicare Part D beneficiaries who were prescribed NSAIDs or opioid analgesics in 2016.

Nationally, 16.4% of these patients used prescription NSAIDs at some time during the year. The Southern region of the United States

demonstrated the highest proportion of use, including Oklahoma, Alabama, Mississippi, and Louisiana. As NSAIDs are widely available over-the-counter, however, these findings likely underestimate the proportions of actual NSAID use.

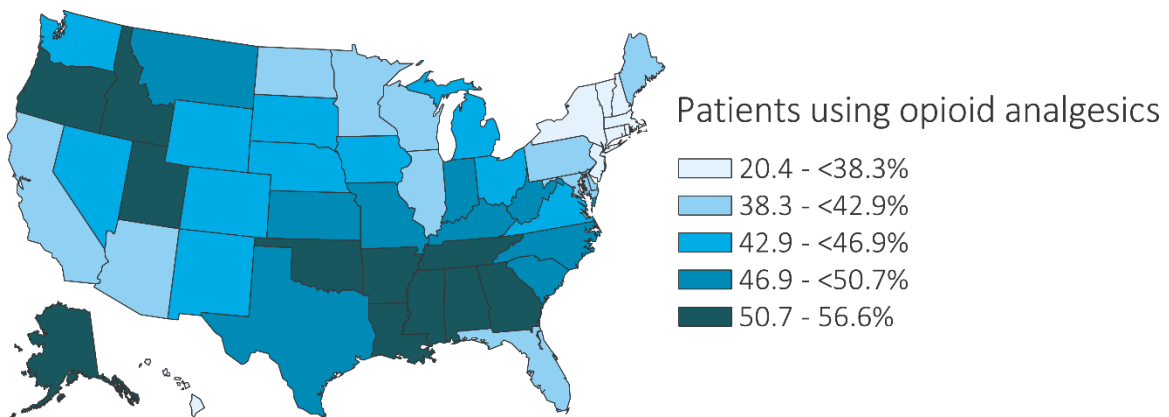
The national proportion of patients using opioid analgesics was higher, at 43.8%. Greatest by-state use occurred in the South Central region (Mississippi, Alabama, Arkansas, Oklahoma, Louisiana and Tennessee,) and the Mountain region (Idaho and Utah). More than half of patients with CKD in these states had received opioid analgesics at some point in 2016. Medication use varies by CKD stage, so results may reflect differences in pain management strategies by state.

vol 1 Figure 8.6 Estimated utilization rate of prescription NSAIDs, by state, Medicare CKD Patients, 2016



Data source: Medicare Part D claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample.
 Abbreviations: CKD, chronic kidney disease; NSAIDs, nonsteroidal anti-inflammatory agents; Part D, Medicare prescription drug coverage benefit.
 NSAIDs filled under Medicare Part D represent a fraction of actual NSAID use.

vol 1 Figure 8.7 Estimated utilization rate of opioid analgesics, by state, Medicare CKD Patients, 2016



Data source: Medicare Part D claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample.
 Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

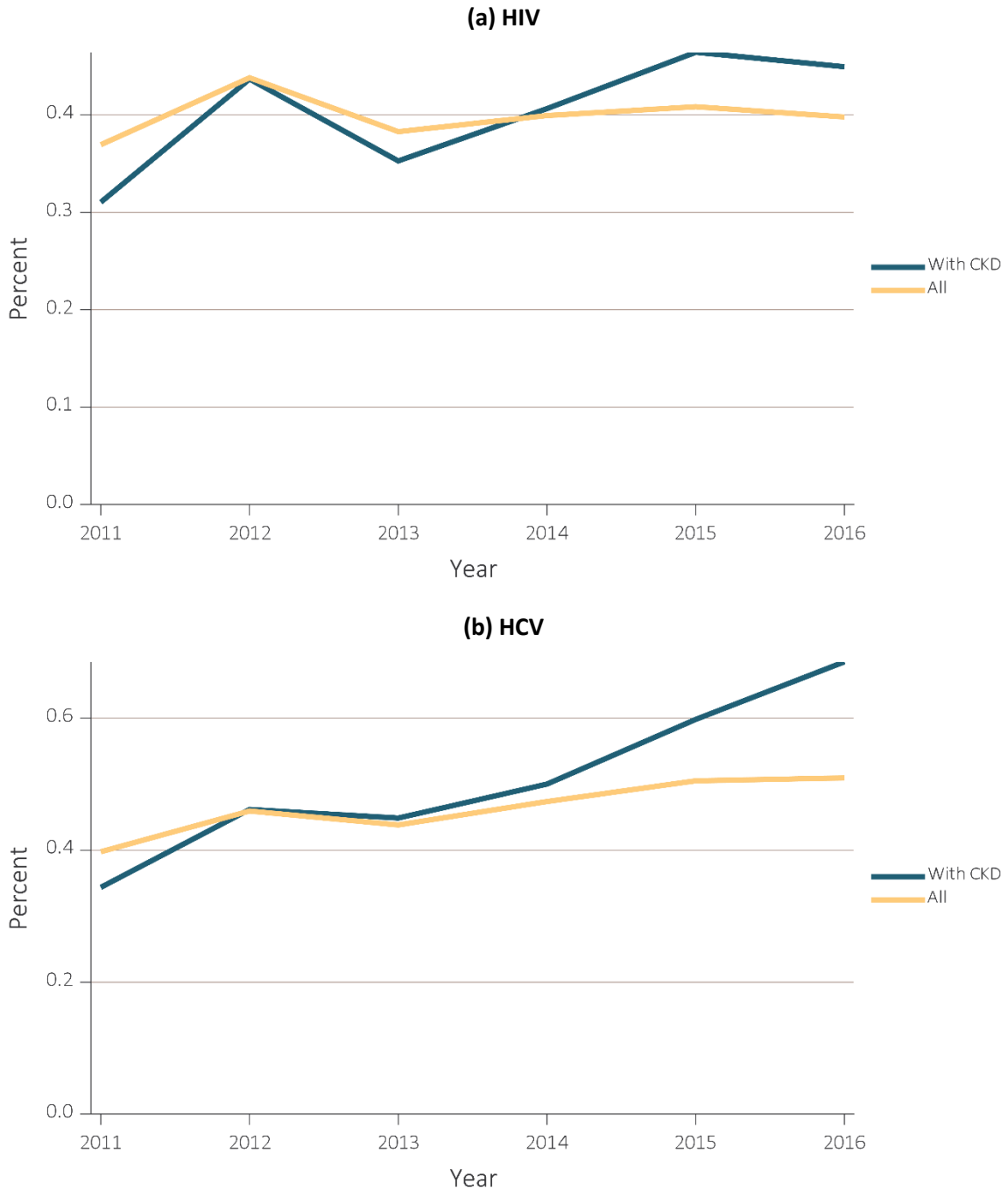
Antiviral Medications

In this section, we examine use of prescribed antiviral medications in Medicare Part D enrollees and particularly assess three main drug classes used for antiviral management—prescription antiretrovirals, nucleosides and nucleotides, and protease inhibitors. These classes of agents are prescribed solely or in combination with others to treat human immunodeficiency virus (HIV), herpes virus infections, hepatitis C (HCV), and hepatitis B. The prevalence of HIV fluctuated in both CKD patients and general Medicare beneficiaries from 2011 to 2016, and the prevalence is slightly higher in CKD than in the general population after 2014 (Figure 8.8.a). The prevalence of HCV stands at 0.4%-0.5% in the general population, while it has gone up from 0.3% in 2011 to 0.7% in 2016 among CKD patients (Figure 8.8.b).

Figure 8.9 displays the proportions of Medicare Part D enrollees prescribed antivirals in 2011-2016. There is a notable increase in use of prescription antivirals among aged CKD patients in the past six years, from 4.2% in 2011 to a peak of 6.5% in 2015, with a decline to 5.0% in 2016. Antiviral use was slightly higher among CKD patients than general Medicare beneficiaries.

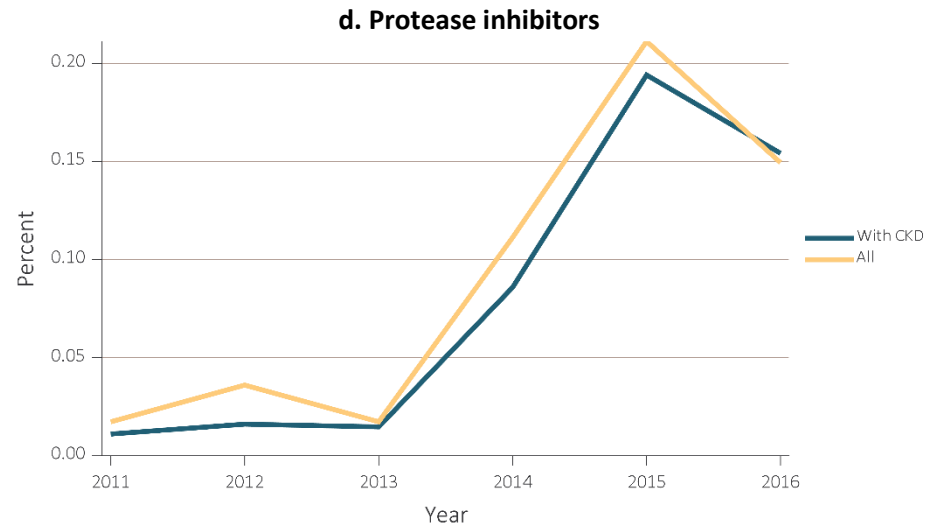
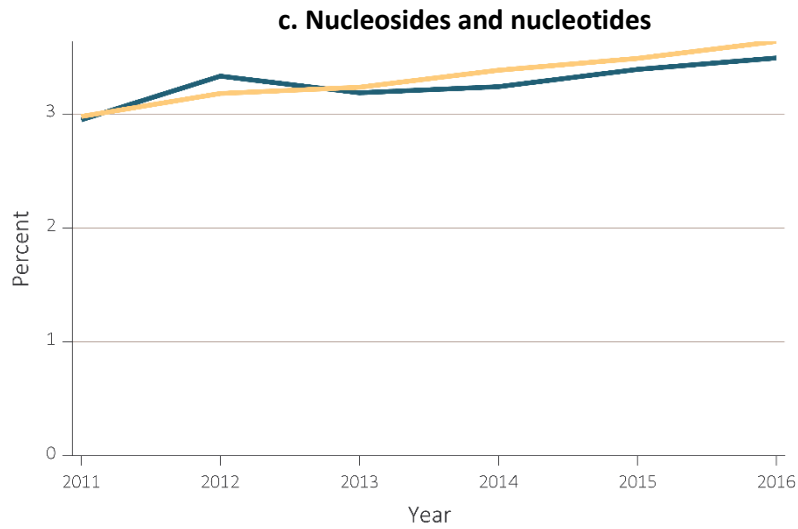
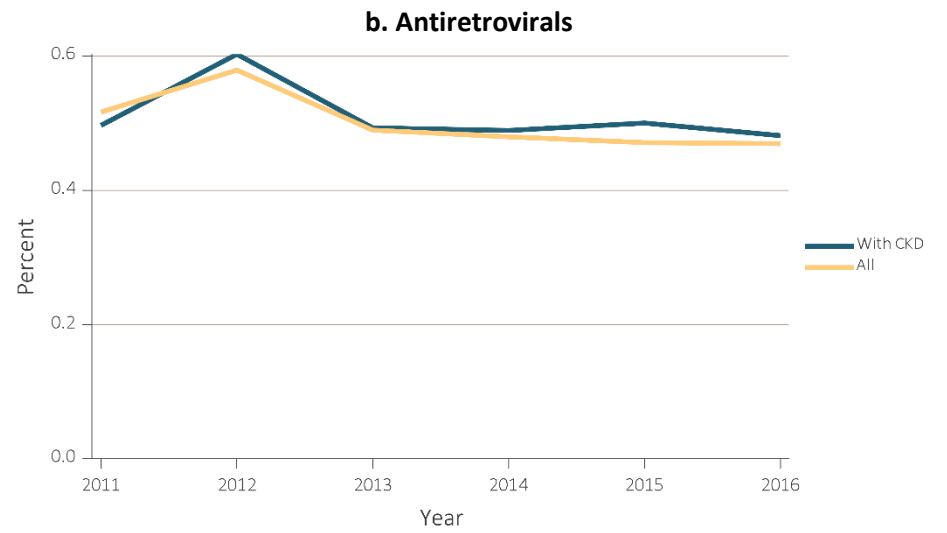
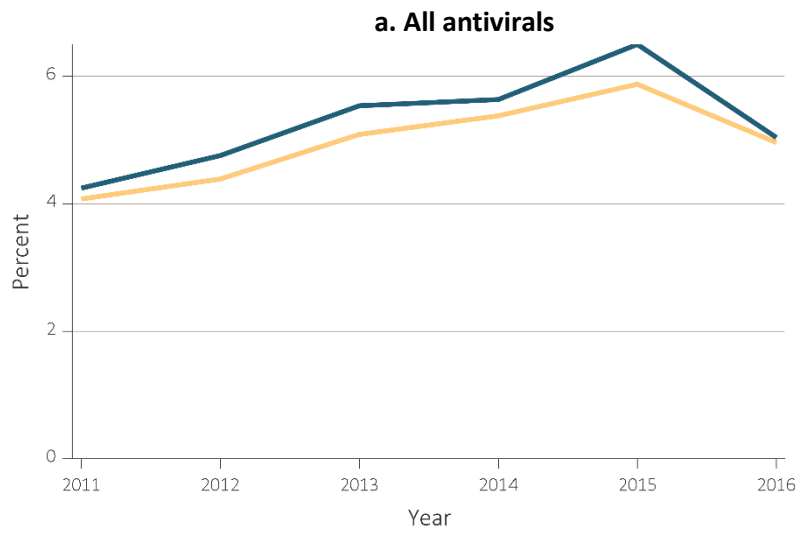
Figure 8.10 displays the PPPY Medicare Part D spending on antivirals by CKD from 2011 to 2016. PPPY Medicare Part D spending was \$2,936 in 2011, peaking at \$5,628 in 2014, before gradually declining to \$5,421 in 2016. PPPY Medicare Part D spending on antivirals was higher among general Medicare beneficiaries than among CKD patients over this period, except during 2016.

vol 1 Figure 8.8 Estimated prevalence of HIV and HCV in Medicare Part D enrollees, 2011-2016



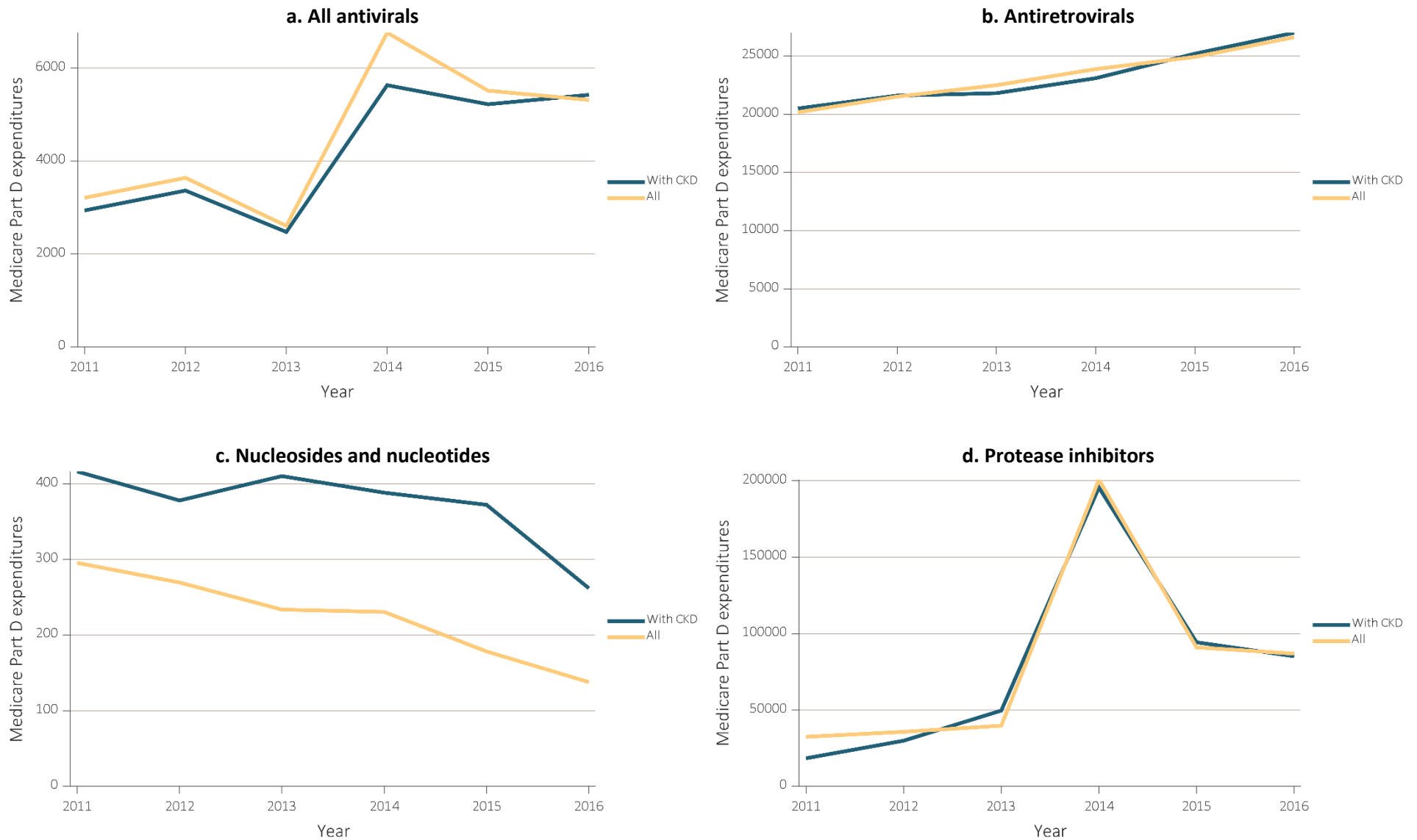
Data source: Medicare Part D claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample. Abbreviations: CKD, chronic kidney disease; HCV, hepatitis C; HIV, human immunodeficiency virus; Part D, Medicare prescription drug coverage benefit.

vol 1 Figure 8.9 Estimated utilization rate of prescription antivirals in Medicare Part D enrollees, 2011-2016



Data source: Medicare Part D claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit.

vol 1 Figure 8.10 Estimated PPPY Medicare Part D spending on antivirals in Medicare Part D enrollees, 2011-2016



Data source: Medicare Part D claims. CKD patients with Medicare Part D stand-alone prescription drug plans in the Medicare 5% sample. Abbreviations: CKD, chronic kidney disease; Part D, Medicare prescription drug coverage benefit; PPPY, per person per year.

References

- Administration on Aging (AoA) and Administration for Community Living (ACL). A Statistical Profile of Older Asian Americans. <https://www.acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/Statistical-Profile-Older-Asian-Americans.pdf>. September 2015. Accessed September 26, 2018.
- Henry J. Kaiser Family Foundation (Kaiser). Medicare indicators: Prescription drug plans: enrollment. <http://kff.org/state-category/medicare/prescription-drug-plans/enrollment-prescription-drug-plans-medicare/>. Accessed May 21, 2018.
- Q1 Medicare. The 2016 Medicare Part D Prescription Drug Program. <https://q1medicare.com/PartD-The-2016-Medicare-Part-D-Outlook.php> Accessed May 11, 2018.
- United States Renal Data System. 2016 USRDS annual data report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2016.

Notes