
2017 USRDS Annual Data Report: Executive Summary

Kidney Disease – a Major Public Health Problem: End-Stage Renal Disease Treated by Dialysis or Transplantation is the Tip of the Iceberg!

This year marks the 28th publication of the Annual Data Report (ADR), a central and ever-evolving component of the United States Renal Data System (USRDS). The USRDS has developed into an internationally utilized resource—a world-class, comprehensive data system that supports high quality surveillance of kidney disease through a patient care, policy, and public health centered mission.

Why should we care about the trends and current state of kidney disease in the US? Research has established these as a disease continuum that holds great cost to both the individual and society. The key to success lies undoubtedly in the realm of prevention and optimal management of CKD in order to slow progression, with the goal of completely avoiding development of ESRD. This, for the most part, is an unmet challenge of the community focused on management of advanced kidney disease or ESRD.

A nexus clearly exists between kidney disease and common non-communicable diseases (NCDs), such as diabetes mellitus, hypertension, and obesity. It is therefore imperative that CKD (including ESRD) continues to be recognized as a major NCD, together with the obesity-metabolic syndrome-diabetes complex, hypertension and cardiovascular diseases, mental health disorders, cancer, and pulmonary diseases.

The onset of end-stage renal disease (ESRD) is easily identified when defined by the use of renal replacement therapies. In contrast, CKD is often silent or under-recognized and awareness in the general population is very low, even though it is readily identifiable through simple testing of blood and urine. Increasing awareness to promote timely recognition

and treatment has the potential to delay progression of the disease and reduce its complications.

Federal agencies have done much to raise awareness of kidney disease as a significant public health problem. Only few decades ago kidney failure was a fatal disease. When dialysis was developed and made available as a chronic therapy, lack of insurance coverage represented a barrier to treatment. This resulted in the passage of the landmark Medicare ESRD program in 1972 to fund ESRD care for all Americans.

In 1988, the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) established The United States Renal Data System (USRDS), the largest and most comprehensive national, ESRD and CKD surveillance system. The initial USRDS Annual Data Reports (ADR) offered a detailed descriptive epidemiology of ESRD. A chapter addressing CKD was introduced in 2003, and was subsequently expanded into a multi-chapter CKD volume from 2008 onward.

Since 2000, CKD has received increasing attention. The consensus definition and staging classification of CKD / KDOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification were first published in 2002. That year also marked the launch of NIDDK's National Kidney Disease Education Program (NKDEP). NKDEP provides information for patients and providers regarding the detection of CKD and care of people with the disease. In 2006, the Centers for Disease Control and Prevention launched a broad CKD initiative, with the CDC CKD Surveillance System as its major component. This project prioritizes the earlier stages of CKD as opposed to ESRD or the late

transitions of care from advanced stages of CKD to ESRD.

In this 2017 ADR, we seek to characterize the spectrum of CKD and ESRD patient populations, and describe the distributions of patients by attributes such as age, sex, race, and comorbid conditions. The topic of Acute Kidney Injury (AKI) continues to receive attention, by virtue of both its bidirectional relationship with CKD and recent policy changes that now provide reimbursement for AKI patients who are dialysis dependent to outpatient dialysis units.

The two current USRDS special studies investigate the transition of care from CKD to ESRD and palliative care for those with advanced kidney disease. These

studies continue to contribute valuable findings to guide practice and policy in the renal community.

Our primary audiences are the healthcare providers involved in care of patients with kidney disease – nephrologists, transplantation specialists, and general physicians. This report is also of value for health care facilities and organizations that provide comprehensive kidney care and renal replacement therapies, and to researchers, policy makers, and service or charitable organizations. We dedicate this work to the individual patients and their families and caregivers whose daily lives are affected by kidney disease.

Newer Considerations for the 2017 USRDS Annual Data Report

Beginning on October 1, 2015, the newly revised International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) coding system was implemented. Many of our data sources utilize these diagnosis codes to identify specific stages of kidney disease and common comorbid conditions. In the 2017 ADR, we addressed the challenge of converting our data and analyses from ICD-9-CM diagnosis and procedure codes to the newly introduced ICD-10-CM. This will allow us to provide continuity with the data trends and analyses presented in previous ADRs. Our CKD and ESRD Analytical Methods chapters include a detailed comparison of the ICD-9-CM and ICD-10-CM diagnosis codes used to define medical conditions in the health insurance claim data files throughout the ADR.

No individual data source exists that captures the disease experience of all Americans who live with kidney disease. A large proportion of our information represents Medicare beneficiaries, who are not a nationally representative group. Thus, each year we strive to find ways to provide a more wholly inclusive report.

This year we include two new data sources that expand our basis of comparison.

- We more broadly examine data purchased from the Optum Clinformatics™ Data Mart Database (OptumInsight, Eden Prairie, MN). The Optum Clinformatics™ Data Mart provides paid medical and prescription claims and enrollment information for participants in commercial insurance plans (e.g. HMOs), and the Medicare Advantage plans of a large U.S. managed care health insurance company. Included are plan members who were enrolled in both a medical and a prescription plan. These data allow us to examine the experience of younger, employed individuals, and all areas of the country are represented in the samples. The Optum Clinformatics™ cohorts include information on about nine million lives per year.
- We also expanded our analyses of Veterans Health Administration Data (VHA). This national health system-derived data represents more than six million veterans.

In 2017, we further characterized the ESRD population by race *and* ethnicity categories as opposed to race *or* ethnicity. In previous ADRs, we considered ethnicity separately from race, based on whether a person was Hispanic, or not. As the Hispanic population in America grows, it becomes more meaningful and accurate to examine separate cohorts

of non-Hispanic White, non-Hispanic Black, and Hispanic patients, the majority of whom identify themselves as White. Wherever possible our race categories match those of the U.S. census. Census definitions change periodically, most recently in 2000. We report data prior to 2000, but in the 2017 ADR employ the most recent census categories wherever possible. However, race and ethnicity categorizations are limited by the categorizations available in the source datasets. We were unable to replicate the current census race and ethnicity characterization in the CKD volume for this reason.

In the interest of examining regional differences, and to provide information salient to our audiences in different areas of the country, this year we have increased the number of geospatial analyses and national maps.

DATA SOURCES AND ANALYTICAL METHODS

Originally, the ADR was the product of a stand-alone database on the diagnoses and demographic characteristics of ESRD patients, along with biochemical data, dialysis claims, and information on treatment and payer histories, hospitalization events, deaths, physician/supplier services, and providers. The findings presented in the current ADR are now drawn from numerous data types and sources. Details of these are described in the Data Sources sections of the *CKD Analytical Methods* and *ESRD Analytical Methods* chapters. We also describe data preparation and management, variable definition, and the analytic methods used to generate the study cohorts, and produce the statistics, figures, and tables presented in the ADR.

Downloadable Microsoft Excel and PowerPoint files containing the data and graphics for the figures and tables are available on the [USRDS website](#).

SUMMARY OF DATA SOURCES

The USRDS uses numerous data sources to describe kidney disease in the U.S. These data are collected in various methods by different sources, each with its own strengths and limitations. Comparisons between chapters and volumes of the ADR should be made in this context.

Data on CKD in the non-institutionalized, general population come from the National Health and Nutrition Examination Survey (NHANES) and the Behavioral Risk Factor Surveillance System (BRFSS), both conducted by the Centers for Disease Control and Prevention.

The majority of USRDS analyses employ claims-based and enrollment data obtained from the Centers for Medicare and Medicaid services (CMS). Files for Medicare Parts A and B contain billing data from final action claims submitted for Medicare beneficiaries in which all adjustments have been resolved. The Medicare Prescription Drug Event File includes data submitted by health plans whenever a Medicare beneficiary fills a prescription; Part D coverage data has been available since its introduction in 2006.

For patients with CKD, acute kidney injury and related comorbidities, analyses are performed on the Medicare 5% sample. These Standard Analytical Files are a random sample of 5% of the entire Medicare population. Medicare ESRD Claims Standard Analysis Files (SAFs) contain data from claims for medical services provided to Medicare beneficiaries with ESRD. Institutional claims include those for inpatient, outpatient, skilled nursing facility, home health agency, and hospice services. Non-institutional claims include those for physicians and suppliers, and for durable medical equipment.

The Medicare Enrollment Database (EDB) is the designated repository of all Medicare beneficiary enrollment and entitlement data, including current and historical information on beneficiary residence, Medicare as secondary payer and employer group health plan status, and Health Insurance Claim/Beneficiary Identification Code cross-referencing.

Others CMS data files consist of information submitted through ESRD specific forms completed by

providers or facilities. These include the Medical Evidence form (CMS 2728), used to register patients at the onset of ESRD, the Death Notification form (CMS 2746), and the Facility Survey form (CMS 2744). This reports the counts of patients being treated at the end of the year, new ESRD patients starting treatment during the year, and patients who died during the year. Both Medicare and non-Medicare end-of-year patients are counted. CMS Dialysis Facility Compare data define corporation name and ownership type for each renal facility.

CROWNWeb is a web-based data collection system begun in 2012. It captures clinical and administrative data from Medicare-certified dialysis facilities for all ESRD patients. This system was implemented nationally in May 2012. Clinical measures are also

available in the VHA data and to a lesser degree in NHANES.

CDC National Surveillance Data was collected during 1993-1997 and 1999-2002. It was a non-patient specific survey of dialysis facilities on patient and staff counts, membrane types, reuse practices, water treatment methods, therapy types, vascular access use, antibiotic use, hepatitis vaccination and conversion rates (for both staff and patients), as well as the incidence of HIV, AIDS, and tuberculosis.

Population data are from the 2000 and 2010 United States Census, and incorporate CDC postcensal and intercensal population estimates. USRDS summarizes the data with different race and ethnicity categories at state and national levels.

Summary/Key Findings

Readers are also referred to the USRDS Infographic at USRDS.org for an overview of key highlights. The following paragraphs represent only an outline of some of the salient findings reported in the 2017 ADR. More detailed commentary and the USRDS Special Studies reports are presented within the individual chapters of the ADR.

CKD

Volume 1 of the 2017 USRDS ADR provides an analysis of CKD in the United States. It includes the following chapters as a road map to the early stages of kidney disease: *CKD in the General Population* (Chapter 1); *Identification and Care of Patients With CKD* (Chapter 2); *Morbidity and Mortality in Patients with CKD* (Chapter 3); *Cardiovascular Disease in Patients with CKD* (Chapter 4); *Acute Kidney Injury* (Chapter 5); *Healthcare Expenditures for Persons with CKD* (Chapter 6); *Prescription Drug Coverage in Patients with CKD* (Chapter 7); and the USRDS Special Study Center reports on *Transition of Care in Chronic Kidney Disease* (Chapters 8 & 9).

Through these topics we tell the story of CKD—one that is important not only to the domestic and international renal communities, but for the general population as well. It is important for everyone to understand and care about the growing implications

of kidney disease. These chapters synthesize a wealth of data to define and understand how this often-silent condition can be recognized. Throughout these chapters, we present status and trends. We discuss risk prediction and prevention, disease management, and opportunities to slow disease progression. We discuss the interactions with common comorbid conditions and the need for interventions before reaching the often-irreversible need for renal replacement therapy.

CHAPTER 1: CKD IN THE GENERAL POPULATION

We continue to provide estimates of CKD prevalence in the general population of the United States based on NHANES data, and using the KDIGO definition of CKD based on single point estimate of eGFR or albuminuria. The prevalence of Stages 1-4 CKD, while relatively stable at 14.8%, implies that an estimated 30 million American adults have CKD. The prevalence of self-reported CKD is very low in the U.S. general population, as indicated in a large representative telephone-based survey (BRFSS). Reports ranged from 1.8% in Virginia to 4.0% in Arizona. Given the overall prevalence of CKD in the U.S. population of about 14%, these numbers are consistent with limited awareness of CKD among those who have the condition (Figure 1.14).

Based on trends observed in the NHANES cohorts, little improvement has been seen in the percentage of individuals with CKD who are aware of their disease, especially among those in Stages 1 to 3. A small increase in disease awareness is now being observed seen in individuals with Stage 4 CKD (Figure 1.13).

CHAPTER 2: IDENTIFICATION AND CARE OF PATIENTS WITH CKD

Over half of patients in the Medicare 5% sample (aged 65 and older) had at least one of three diagnosed chronic conditions – CKD, cardiovascular disease (CVD), or diabetes mellitus (DM), while 18.5% had two or more of these conditions. Within a younger population derived from the Optum Clinformatics™ Data Mart (ages 22-64 years), 9.9% had at least one of the three conditions, and 1.3% had two or more of these conditions. As indicated by diagnosis claims from the VHA, 15.4% of patients had at least one of the three conditions, while 2.7% had at least two. (Table 2.2.b). In the Medicare 5% sample and VHA data, 11.7% and 9.7% of patients had a diagnosis of CKD in 2015, as opposed to only 1.1% of patients in the Optum Clinformatics™ population (Table 2.4). Of those in the 2010 Medicare 5% sample who had a diagnosis of CKD Stage 3, by 2015, 3.5% had progressed to ESRD and 40.3% had died. For these Medicare patients without identified CKD, progressions to ESRD and death by 2015 were 0.2% and 21.3% (Table 2.5).

CHAPTER 3: MORBIDITY AND MORTALITY IN PATIENTS WITH CKD

In 2015, Medicare patients with CKD experienced a mortality rate of 109.7 per 1,000 patient-years. When adjusted for sex, age, and race, the rate remained more than double the 45.6 per 1,000 patient-years of those without CKD. Mortality rates increased with CKD severity, but the gap has narrowed between CKD and non-CKD patients from 2003-2015. Among patients with CKD, a decrease in hospitalization rates occurred from 2014 to 2015; even after adjustment the Medicare CKD group decreased by 2.1%, from 595 to 583 per 1,000 patient-years at risk, and by 1.7%, from 237 to 233 per 1,000 for the no-CKD group. In contrast, during the same period an increase in hospitalization rates occurred for Optum Clinformatics™ beneficiaries;

even after adjustment the CKD group increased by 3.9%, from 174 to 181 per 1,000 patient-years at risk. At 21.5%, rates of rehospitalization for CKD patients were higher than the 15.5% for those without CKD.

CHAPTER 4: CARDIOVASCULAR DISEASE IN PATIENTS WITH CKD

CKD patients are more than twice as likely to have CVD compared to non-CKD Medicare patients (CVD prevalence 66% versus 32%, respectively). Heart failure (HF) prevalence increases dramatically with CKD severity; nearly 40% of patients with Stages 4-5 CKD carried a diagnosis of HF in 2015. Atrial fibrillation (AF) is common among Medicare patients with CKD, affecting about 25% of this population. The prevalence of AF is higher among males, older persons, and patients with hypertension (HTN), advanced stages of CKD, and HF.

CHAPTER 5: ACUTE KIDNEY INJURY

In 2015, the percent of Medicare fee-for-service beneficiaries experiencing a hospitalization complicated by Acute Kidney Injury (AKI) was 4.0%; this appears to have plateaued since 2011. A similar trend was observed in the Clinformatics™ population, among whom 0.3% had an AKI hospitalization in 2015. In 2013, Medicare patients aged 66 years and older who were hospitalized for AKI had a 35% cumulative probability of a recurrent AKI hospitalization within one year. For Clinformatics™ patients aged 22 years and older, the probability of recurrent AKI hospitalization was 23%. Among the older Medicare patients, 28% were given an initial diagnosis of CKD in the year following an AKI hospitalization. In the Clinformatics™ population, 19% of patients with an AKI hospitalization were newly classified as having CKD in the subsequent year.

CHAPTER 6: HEALTHCARE EXPENDITURES FOR PERSONS WITH CKD

Medicare spending for all beneficiaries who have CKD (10% of total) exceeded \$64 billion in 2015 (20% of spending; Tables 6.1 and 6.3). When adding the \$34 billion of spending for beneficiaries with ESRD (volume, 2 Figure 9.2), total Medicare spending for beneficiaries with kidney disease was nearly \$100 billion. 60% of Medicare beneficiaries aged 65 and older with CKD also had DM, HF or both, and accounted for over 70% of total Medicare spending for beneficiaries with CKD (Table 6.1). Growth in total CKD spending has primarily been driven by growth in the number of identified cases, particularly in the earlier stages (CKD 1-3).

CHAPTER 7: MEDICARE PART D PRESCRIPTION DRUG COVERAGE IN PATIENTS WITH CKD

In 2015, per patient per year (PPPY) spending on prescriptions for CKD patients was 1.5 times higher than general beneficiaries in those patients with stand-alone Part D plans (\$4,547 vs. \$2,971), 1.7 times higher in those with Medicare Advantage plans (2,914, vs. 1,760) and 4.5 times higher in those with commercial coverage (\$4,398 vs. \$971; Figure 7.5.a). By drug class, the greatest medication expenditures by Medicare Part D were for antidiabetic agents (\$1,685.4 millions), followed by antineoplastic agents (\$994.6 millions), antivirals (\$643.5 millions), and lipid-lowering agents (\$437.5 million, Tables 7.7.a). Importantly, nearly 44.5% of Medicare CKD patients had at least one filled prescription for opioid agonists, ranging from 57.0% in Mississippi to 22.6% in Hawaii.

ESRD

Volume 2 of the ADR provides key statistics on ESRD in the United States and includes the following chapters: Incidence, Prevalence, Patient Characteristics, and Treatment Modalities (Chapter 1); Clinical Indicators and Preventive Care (Chapter 2); Vascular Access (Chapter 3); Hospitalization (Chapter 4); Mortality (Chapter 5); Transplantation (Chapter 6); ESRD among Children, Adolescents, and Young Adults (Chapter 7); Cardiovascular Disease in Patients With ESRD (Chapter 8); Healthcare Expenditures for Persons With ESRD (Chapter 9); Prescription Drug Coverage in Patients With ESRD (Chapter 10);

International Comparisons (Chapter 11); and the USRDS Special Study Center report on End-of-life Care for Patients With ESRD (Chapter 12). In addition we also present current progress on the kidney disease objectives outlined in the Healthy People 2020 program.

CHAPTER 1: INCIDENCE, PREVALENCE, PATIENT CHARACTERISTICS, AND TREATMENT MODALITIES

In 2015, 124,111 new cases of end stage renal disease (ESRD) were reported with a total of nearly 500,000 patients receiving dialysis treatment and well over 200,000 living with a kidney transplant. Despite the 6.1% decline in the age-sex-race-adjusted incidence rate of ESRD between 2009 and 2015, the annual number of incident cases has increased by 7.5% during the same period, due to the aging and growing size of the U.S. population. Native Hawaiians and Pacific Islanders have a very high incidence rate. Although the age-sex-adjusted ESRD incidence rate in this patient population declined by 17% from 2000 to 2015, in 2015 it was nearly three times greater than for African Americans and more than six times greater than for whites. In contrast to adjusted incidence-rate trends between 2000 and 2015, the adjusted prevalence of ESRD increased in every racial group, except Native Americans, due primarily to declining mortality rates among ESRD patients.

CHAPTER 2: CLINICAL INDICATORS AND PREVENTIVE CARE:

In 2016, 97% of patients undergoing HD and 89% of patients undergoing peritoneal dialysis (PD) achieved targets for HD adequacy. Since 2011, the percentages of HD and PD patients having hemoglobin levels within a target range of 10-12 g/dL have improved with more judicious use of erythropoietin. Since implementation of the CMS ESRD Quality Incentive Program, the percentage of ESRD patients with hypercalcemia (calcium >10.2 mg/dL) has declined.

CHAPTER 3: VASCULAR ACCESS:

Arteriovenous fistula (AV) use at HD initiation rose from 12% to 17% over the period 2005-2015 (Figure 3.1). The percentage of patients using an AV fistula or with a maturing AV fistula at HD initiation increased from 28.9% to 33.4% over the same period (Figure 3.1). Seventeen percent of patients used an AV fistula exclusively at dialysis initiation. This increased to 65% by the end of one year on HD, and to 72% at the end of two years (Figure 3.7.a).

CHAPTER 4: HOSPITALIZATION:

Over the past decade, the frequency of hospital admissions and resulting number of hospital days for ESRD patients have declined gradually and consistently. In 2015, the adjusted rates of admission for HD patients and for PD patients decreased to 1.7 per patient year (PPY) as compared to 2.1 in 2006, a reduction of 19.0%. During that same period, admission rates for transplant patients reduced by 20.0%, to 0.8 days in 2015 from 1.0 in 2006. During this same decade, HD patient hospitalizations due to cardiovascular events and for vascular access infections fell by 23.3% and 8.3%. Patients with CKD and ESRD experienced rehospitalization rates of 21.4% and 35.2%, as compared to only 15.4% for older Medicare beneficiaries without a diagnosis of kidney disease.

CHAPTER 5: MORTALITY:

Between 2001 and 2015, adjusted mortality rates decreased by 28% for dialysis patients. The net reductions in mortality from 2001 to 2015 were 27% for HD patients and 41% for PD patients (Figure 5.1). Patterns of mortality during the first year of dialysis differ substantially by modality. For HD patients, reported mortality is highest in month 2, but declines thereafter; this effect is more pronounced for patients aged 65 and over. In contrast, mortality for PD patients is relatively low initially but rises slightly over the course of the year (Figure 5.3). Dialysis patients continue to have substantially higher mortality compared to the general population and Medicare populations with cancer, diabetes, or cardiovascular disease. However, the relative and absolute decline in mortality for dialysis patients in the past 15 years has

been greater than for Medicare patients in these other diagnostic categories (Tables 5.5).

CHAPTER 6: TRANSPLANTATION:

On December 31, 2015, the kidney transplant waiting list had 83,978 candidates on dialysis, 52,703 (62.8%) of whom were active. Eighty-four percent of all candidates were awaiting their first transplant (Figure 6.1). Among 2010 candidates newly wait-listed for either a first time or repeat kidney-alone transplant (living or deceased donor), the median waiting time to transplant was 3.9 years (Figure 6.4). This waiting time varied greatly by region of the country, from a low of 1.2 years in Utah to a high of 5.2 years in Georgia (Reference Table E.2.2). For the first time, a decrease in kidney transplant waiting list by 2.3 percent is observed. This is likely a result of recent changes in kidney allocation system. Since 1998, the probabilities of graft survival and patient survival have steadily improved among recipients of both living and deceased donor kidney transplants (Tables 6.4 and 6.5). In 2014, the probabilities of one-year graft survival were 93% and 97% for deceased and living donor kidney transplant recipients, respectively (Tables 6.4 and 6.5).

CHAPTER 7: ESRD AMONG CHILDREN, ADOLESCENTS, AND YOUNG ADULTS:

The one-year ESRD patient mortality among the 0-4 year age group has declined approximately 41.6% over the past decade. As of December 31, 2015, the point prevalence of children and adolescents, 0 to 21 years of age, with ESRD was 9,672, or 99.5 per million population. There are an additional, 10,251 adult survivors of childhood onset ESRD contributing to the 2015 point prevalence of ESRD in adults. The number of children and adolescents beginning ESRD care is steadily decreasing from a high of 17.5 per million in 2004 to 13.7 per million population in 2015, representing a decrease of 21.7%.

CHAPTER 8: CARDIOVASCULAR DISEASE (CVD) IN PATIENTS WITH ESRD:

CVD is prevalent in a majority of dialysis patients (70% of HD patients and 57% of PD patients), with HF, CAD, and PAD being the three most common

cardiovascular diagnoses in the dialysis population. All CVD diagnoses are associated with decreased survival in ESRD, with acute myocardial infarction (AMI) and sudden cardiac arrest/ventricular arrhythmia being most closely associated with 2-year mortality. Given the many challenges of pharmacotherapy in advanced kidney disease, potentially beneficial cardiovascular drugs are often not prescribed to ESRD patients. In 2015, only about two-thirds of dialysis or transplant patients with AMI received beta-blockers. Among ESRD patients with HF, fewer than half received angiotensin converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs). Only about one-third of dialysis patients with AF were treated with warfarin for stroke prevention.

CHAPTER 9: HEALTHCARE EXPENDITURES FOR PERSONS WITH ESRD:

Between 2014 and 2015 Medicare fee-for-service spending for beneficiaries with ESRD rose by 2.4%, from \$33.1 billion to \$33.9 billion, accounting for 7.1% of the overall Medicare paid claims costs, a figure that has remained stable since 2004 (Figure 9.2). This marks the fourth year of modest growth relative to historical trends. In 2015, ESRD spending per patient per year (PPPY) increased by 1.1% (Figure 9.4). Given that ESRD PPPY spending either decreased or increased only slightly from 2009 to 2015, the rise in Medicare expenditures for beneficiaries with ESRD during these years is almost entirely attributable to growth in the number of covered lives. For HD care, both total and PPPY spending were nearly flat between 2014 (\$26.2 billion and \$88,750; Figures 9.7 and 9.8) and 2015 (\$26.7 billion and \$88,195). During this period, total PD spending grew by 4.7%, as the share of patients receiving PD continued to rise. PD PPPY spending rose 1.6% from 2014 to 2015, however, and PD remained less costly on a per patient basis than HD.

CHAPTER 10: PRESCRIPTION DRUG COVERAGE IN PATIENTS WITH ESRD:

By modality, dialysis patients had a higher PPPY spending on prescriptions than transplant patients in patients enrolled in stand-alone Part D plans (HD\$12,589; PD: \$11,828; Transplant: \$8,038), while dialysis patients had a lower PPPY spending on

prescription than transplant patients in those with Medicare Advantage plans (\$5,596 vs. \$9,181) and those with commercial coverage (\$7,794 vs. \$10,199; Figure 10.5a-c). Ion-removing agents (mostly Kayexalate), cinacalcet, antidiabetic agents, antivirals, and immunosuppressive agents were the most costly prescriptions for ESRD patients (Tables 10.7). Importantly, approximately 50.3% of Medicare ESRD patients used opioid agonists, ranging from 38.1% in New York to 59.2% in Alabama (Figure 10.7).

CHAPTER 11: INTERNATIONAL COMPARISONS:

The number of countries and regions represented in this year's International Comparisons Chapter increased to 73, with the addition of Albania, Brunei (Darussalam), Bulgaria, Egypt, Kazakhstan, Latvia, Lithuania, the Republic of Macedonia, and Peru. In 2015, nearly 2.5 million patients were treated for ESRD across all reporting countries. Treated ESRD prevalence, per million population (PMP), varied nearly 30-fold across represented countries, with the three highest rates of 3,317 PMP (Taiwan), 2,529 PMP (Japan), and 2,138 PMP (United States); the lowest reported rates were 119 – 211 PMP in Bangladesh, Ukraine, South Africa, Indonesia, and Kazakhstan. (Figure 11.9). In-center HD is the most commonly utilized therapeutic approach for treatment of ESRD in the majority of countries. However, transplantation was the primary renal replacement therapy – used for 51–72% of ESRD patients – in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) and in Estonia, Latvia, the Netherlands, Switzerland, the U.K. (including Scotland), Spain, Austria, and Qatar. (Figure 11.12)

HEALTHY PEOPLE 2020:

Within every age group, the death rate of dialysis patients was 17% - 55% lower in 2015 than in 2006. (CKD-14.1). Within every age group of adult HD patients, fistula use is 1-3 percentage points higher in 2015 than in 2012. (CKD-11.1). Within every age group except 0-4 year-olds (20% growth) and 25-44 year-olds (1% growth), the rate of new cases of ESRD per million population is 1-21% lower than in 2006. (CKD-9.1).