

# Chapter 8: Dialysis Providers

## Introduction

The 2013 ADR chapter on ESRD providers focused on potential associations between the bundled Prospective Payment System (PPS) and provider practices specifically related to anemia management, including decreased erythropoiesis stimulating agent (ESA) use, a fall in hemoglobin levels, and a slight increase in blood transfusion rates. Because more recent Medicare Part D data were not available in time to reassess ESA use for this year's ADR, we have chosen to highlight three other important areas of practice related to provision of care to patients on dialysis. These include (i) choice of dialysis modality by provider (2010–2012), (ii) patterns of vascular access type by provider for both incident and prevalent dialysis patients (2012), and (iii) the proportion of patients younger than age 70 who are wait-listed for kidney transplantation (2010–2012).

Overall, we note an increase in the utilization of peritoneal dialysis (PD). More than three-quarters of all new patients are beginning hemodialysis (HD) using an indwelling catheter as their vascular access, suggesting suboptimal preparation for ESRD, although not necessarily under the direct influence of dialysis providers. Over the period 2010–2012 and across providers, there was no observable change in the proportion of patients wait-listed for kidney transplantation, with only approximately one-quarter of those under the age of 70 years being wait-listed.

We conclude the chapter with an analysis of standardized mortality and hospitalization ratios by provider type, namely, large dialysis organizations (LDOs), small dialysis organizations (SDOs), and independent and hospital-based providers. Standardized mortality ratios (SMRs) and standardized hospitalization ratios (SHRs) in 2012 were similar between large and small dialysis

organizations and, for the most part, declined slightly from 2010 to 2012. Somewhat surprisingly, at hospital-based units the SMR was 11.4 percent lower than the national average, while the SHR was higher than the national average.

## Analytical Methods

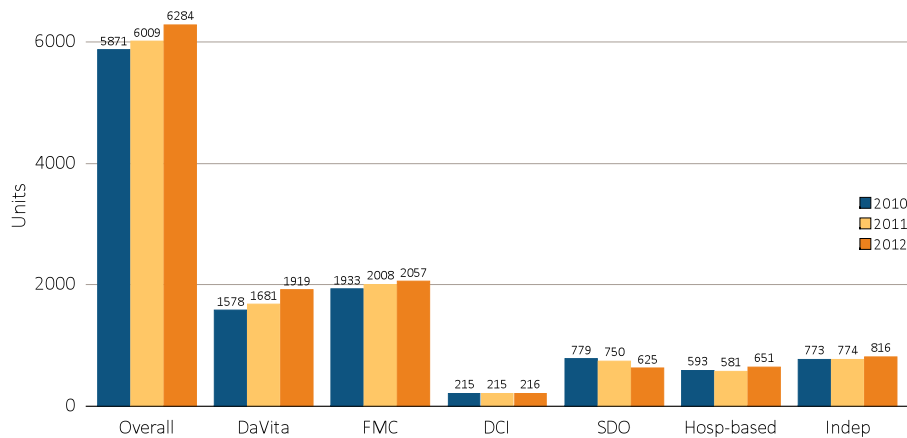
See the ESRD Analytical Methods chapter for an explanation of methods used to generate the figures and tables in this chapter.

## Provider Growth

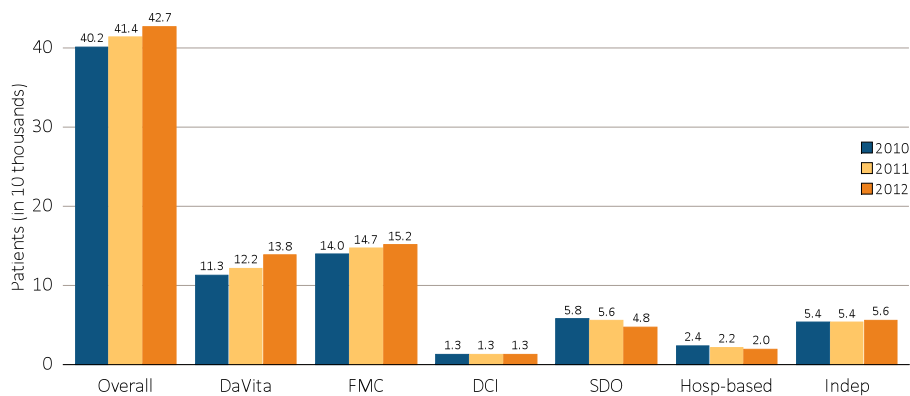
At the end of 2012, there were 6,284 dialysis units in the United States (Figure 8.1). Together, the three LDOs (DaVita, Fresenius [FMC], and Dialysis Clinic, Inc. [DCI]) treated 303,529 patients (71 percent) in 4,192 dialysis units (68 percent). SDOs treated 47,653 patients (10 percent) in 625 units (10 percent), whereas independent and hospital-based providers treated 56,319 (13 percent) and 19,959 (5 percent) patients, respectively, in 816 (13 percent) and 651 (10 percent) units. Nationwide, 413 dialysis units were added during the three-year period from 2010 to 2012, with most belonging to the LDOs. In the SDOs, the numbers of patients and units continued to decline over the same period.

vol 2 Figure 8.1 Dialysis units & patient counts, by unit affiliation, 2010–2012.

(a) Dialysis units



(b) Patient counts

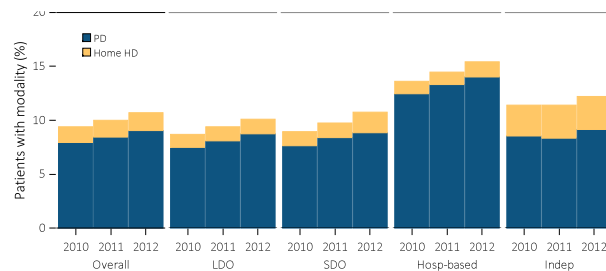


Data source: Special analyses, USRDS ESRD Database. Abbreviations: DCI, Dialysis Clinic, Inc.; FMC, Fresenius; Hosp-based, hospital-based dialysis centers; Indep, independent dialysis providers; SDO, small dialysis organizations.

## Key Practices: Dialysis Modality Choice, Vascular Access and Wait-listing for Kidney Transplantation

In 2012, nearly 90 percent of all dialysis patients received hemodialysis (Figure 8.2). This proportion was relatively consistent across provider types, with hospital-based providers having the lowest proportion of patients on HD at 84.6 percent, and the highest proportion of PD patients at 14 percent. Across all provider types, the modality type was relatively constant from 2010–2012. However, the nationwide prevalence of PD increased slightly, from 7.9 percent in 2010 to 9.0 percent in 2012. This indicates an encouraging, recent trend reversal (see Vol. 2, Chapter 1, *Incidence, Prevalence, Patient Characteristics, and Modalities*).

vol 2 Figure 8.2 Prevalence of home dialysis modality, by unit affiliation, 2010–2012



Data source: Special analyses, USRDS ESRD Database. Abbreviations: HD, hemodialysis; Hosp-based, hospital-based dialysis centers; Indep, independent dialysis providers; LDO, large dialysis organizations; PD, peritoneal dialysis; SDO, small dialysis organizations.

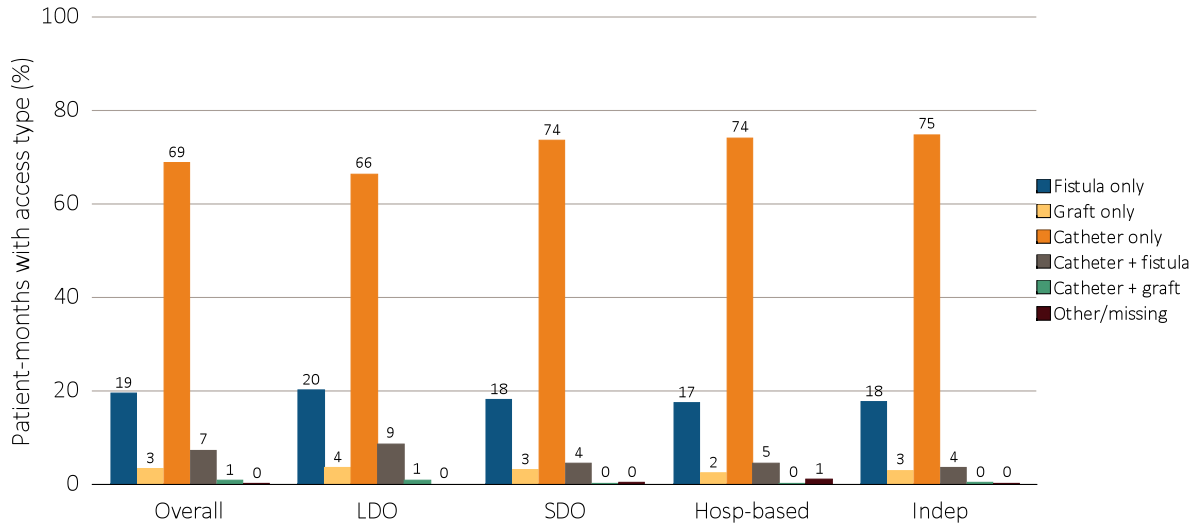
Nationally in 2012, 62 percent of HD patients received their treatment via an arteriovenous fistula and 19 percent via an indwelling catheter (Figure 8.3). Fistula use was highest among LDOs and independent providers at 62 percent; catheter use was highest at 28 percent in hospital-based providers. Among dialysis patients in their first 30 days of ESRD, most (77 percent) received dialysis via a catheter; LDOs had

the highest rate of fistula placement at 29 percent, compared with 27 percent overall nationally.

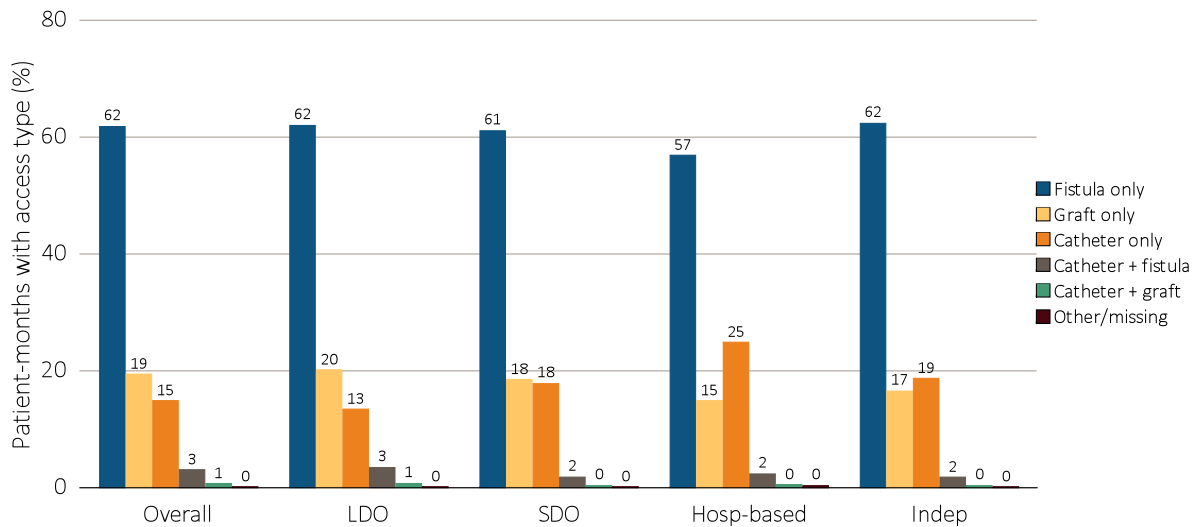
Kidney transplantation is the modality of choice for most individuals with ESRD and is associated with the highest quality of life and survival for this patient population. Nationally, the percentage of patients on a kidney transplant waiting list was fairly consistent

vol 2 Figure 8.3 Prevalence of vascular access type, by unit affiliation, 2012

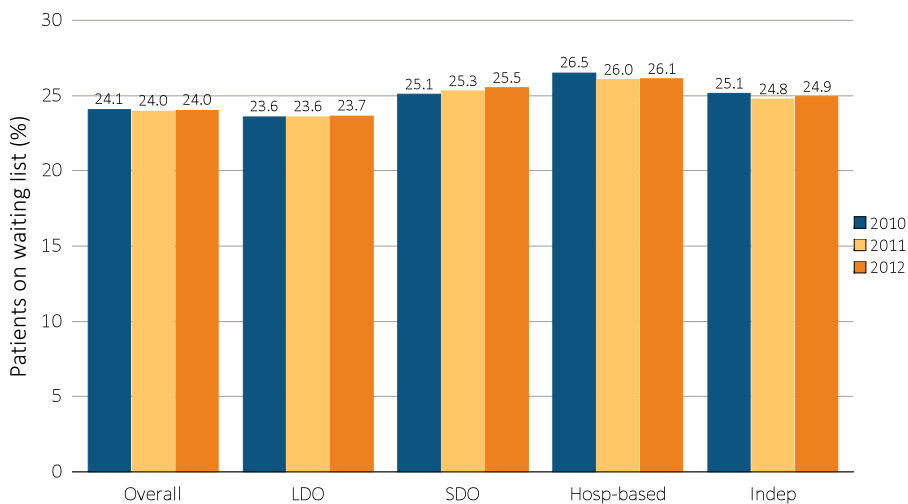
(a) Among incident dialysis patients



(b) Among prevalent dialysis patients



Data source: Special analyses, USRDS ESRD Database. Period prevalent hemodialysis patients. Abbreviations: Hosp-based, hospital-based dialysis centers; Indep, independent dialysis providers; LDO, large dialysis organizations; SDO, small dialysis organizations.

**vol 2 Figure 8.4 Percentage of patients younger than 70 on a kidney transplant waiting list, by unit affiliation, 2010–2012**

Data source: Special analyses, USRDS ESRD Database. Dialysis patients younger than 70 on December 31. Abbreviations: Hosp-based, hospital-based dialysis centers; Indep, independent dialysis providers; LDO, large dialysis organizations; SDO, small dialysis organizations.

between 2010 and 2012, with fewer than 25 percent of patients younger than 70 on a waiting list (Figure 8.4). This measure is limited to patients younger than 70 to be consistent with Vol. 2, Chapter 2, *Healthy People 2020* goals. SDOs and hospital-based providers had the highest rates of wait-listed patients in 2012, at 25.7 percent and 26.0 percent, respectively.

## Standardized Mortality & Hospitalization Ratios

All provider types experienced significant declines in SMRs (Table 8.1) between 2010 and 2012. Among the LDOs, DCI experienced a nonsignificant increase in SMR, from 0.94 in 2010 to 0.95 in 2012. In 2012, independent providers had the highest SMRs at 1.01.

Among the LDOs in 2012, DCI had the lowest SMR at 0.95, compared with 0.97 and 0.98, respectively, for DaVita and Fresenius (Table 8.1). Between 2010 and 2012, DaVita and Fresenius experienced significant declines in SMRs.

Between 2010 and 2012, White patients experienced decreases in SMR of similar magnitude as those in the overall population (Table 8.1). For these patients, SMR increased only among DCI facilities (nonsignificantly), by 1.6 percent, having fallen 3.9 percent overall.

Compared with the overall dialysis population, the decrease in SMR between 2010 and 2012 was of greater magnitude in the Black/African American population (Table 8.1). Among Black/African American patients, overall SMR decreased significantly by 7.6 percent, compared with a 5.0 percent overall decrease during the same time period. SMRs for Black/African American patients decreased among all provider types, significantly in DaVita, Fresenius, hospital-based and independent providers.

Compared with the overall dialysis population, the decrease in SMR between 2010 and 2012 was of greater magnitude in the Hispanic population (Table 8.1). Among Hispanic patients, overall SMR decreased significantly by 6.0 percent, compared with a 5.0 percent overall decrease during the same time period. SMR for Hispanic patients increased by 5.8 percent in units owned by DCI, but this change was not significant. Patients treated by all other provider types experienced decreases in SMR.

All types of providers experienced significant declines in SHRs (Table 8.2) between 2010 and 2012, with the exception of hospital-based providers, for which SHR increased significantly, by 1.7 percent. In 2012, hospital-based providers had the highest SHRs at 1.09.

Among the LDOs in 2012, DCI had the lowest SHR, at 0.91, compared with 1.02 and 1.01, respectively, for DaVita and Fresenius (Table 8.2). Between 2010 and 2012, all three LDOs experienced significant declines in SHRs.

Between 2010 and 2012, White patients experienced decreases in SHR of similar magnitude as those in the overall population (Table 8.2). For these patients, SHR increased only among hospital-based providers, from 1.04 to 1.06, which is a significant net change of 2.1 percent compared with the overall decrease among White patients of 2.5 percent.

vol 2 Table 8.1 All-cause standardized mortality ratio, by unit affiliation, 2010–2012

Affiliation	2010	2011	2012
<b>All patients</b>			
<b>Overall</b>	1.02 (1.02-1.03)	1.00 (1.00-1.01)	0.97 (0.97-0.98)
<b>LDO</b>			
Davita	1.05 (1.03-1.06)	1.02 (1.01-1.03)	0.97 (0.96-0.98)
Fresenius	1.03 (1.02-1.05)	1.02 (1.01-1.03)	0.98 (0.97-0.99)
DCI	0.94 (0.91-0.98)	0.92 (0.89-0.96)	0.95 (0.91-0.98)
<b>SDO</b>	1.02 (1.00-1.04)	1.03 (1.01-1.04)	1.00 (0.98-1.01)
<b>Hospital-based</b>	0.93 (0.91-0.95)	0.85 (0.83-0.87)	0.86 (0.84-0.88)
<b>Independent</b>	1.04 (1.02-1.05)	1.01 (1.00-1.03)	1.01 (0.99-1.02)
<b>White patients</b>			
<b>Overall</b>	1.14 (1.13-1.15)	1.13 (1.12-1.14)	1.10 (1.09-1.11)
<b>LDO</b>			
Davita	1.17 (1.15-1.19)	1.15 (1.14-1.17)	1.10 (1.08-1.11)
Fresenius	1.15 (1.14-1.17)	1.15 (1.14-1.17)	1.11 (1.10-1.13)
DCI	1.10 (1.05-1.15)	1.09 (1.04-1.14)	1.12 (1.07-1.17)
<b>SDO</b>	1.14 (1.11-1.16)	1.13 (1.11-1.16)	1.10 (1.07-1.12)
<b>Hospital-based</b>	1.05 (1.02-1.08)	0.96 (0.94-0.99)	0.96 (0.94-0.99)
<b>Independent</b>	1.14 (1.12-1.17)	1.12 (1.10-1.14)	1.13 (1.11-1.16)
<b>Black/African American patients</b>			
<b>Overall</b>	0.88 (0.87-0.89)	0.84 (0.83-0.85)	0.81 (0.80-0.82)
<b>LDO</b>			
Davita	0.89 (0.88-0.91)	0.84 (0.82-0.86)	0.80 (0.78-0.82)
Fresenius	0.87 (0.86-0.89)	0.84 (0.83-0.86)	0.81 (0.79-0.82)
DCI	0.79 (0.74-0.84)	0.75 (0.70-0.80)	0.75 (0.70-0.80)
<b>SDO</b>	0.87 (0.84-0.90)	0.88 (0.85-0.91)	0.85 (0.82-0.88)
<b>Hospital-based</b>	0.89 (0.85-0.92)	0.79 (0.75-0.82)	0.85 (0.81-0.89)
<b>Independent</b>	0.90 (0.87-0.93)	0.88 (0.85-0.91)	0.84 (0.81-0.87)
<b>Hispanic patients</b>			
<b>Overall</b>	0.80 (0.79-0.82)	0.80 (0.78-0.81)	0.75 (0.74-0.77)
<b>LDO</b>			
Davita	0.75 (0.73-0.78)	0.76 (0.74-0.79)	0.73 (0.71-0.75)
Fresenius	0.85 (0.82-0.87)	0.83 (0.81-0.86)	0.77 (0.75-0.80)
DCI	0.77 (0.65-0.91)	0.67 (0.56-0.79)	0.81 (0.69-0.95)
<b>SDO</b>	0.84 (0.80-0.87)	0.84 (0.81-0.88)	0.81 (0.77-0.85)
<b>Hospital-based</b>	0.67 (0.63-0.72)	0.64 (0.59-0.69)	0.61 (0.57-0.66)
<b>Independent</b>	0.83 (0.79-0.87)	0.81 (0.77-0.85)	0.78 (0.74-0.81)

Data source: Special analyses, USRDS ESRD Database. Period prevalent dialysis patients; 95% confidence intervals are shown in parentheses. The overall measure is adjusted for patient age, race, ethnicity, sex, diabetes, duration of ESRD, nursing home status, patient comorbidities at incidence, body mass index (BMI) at incidence and population death rates. The white- and black-specific measures are adjusted for all the above characteristics except patient race. The Hispanic-specific measure is adjusted for all the above characteristics except patient ethnicity. Abbreviations: DCI, Dialysis Clinic, Inc.; LDO, large dialysis organizations; SDO, small dialysis organizations.

vol 2 Table 8.2 All-cause standardized hospitalization ratio, by unit affiliation, 2010–2012

Affiliation	2010	2011	2012
<b>All patients</b>			
<b>Overall</b>	1.01 (1.01-1.02)	1.00 (1.00-1.01)	0.98 (0.98-0.98)
<b>LDO</b>			
Davita	1.02 (1.02-1.03)	1.01 (1.00-1.01)	0.98 (0.98-0.98)
Fresenius	1.01 (1.01-1.02)	1.00 (1.00-1.00)	0.97 (0.97-0.97)
DCI	0.91 (0.90-0.92)	0.91 (0.90-0.92)	0.89 (0.88-0.91)
<b>SDO</b>	1.02 (1.01-1.02)	1.02 (1.02-1.03)	0.98 (0.98-0.99)
<b>Hospital-based</b>	1.07 (1.06-1.08)	1.05 (1.04-1.06)	1.09 (1.08-1.10)
<b>Independent</b>	1.00 (0.99-1.00)	0.99 (0.99-1.00)	0.98 (0.97-0.98)
<b>White patients</b>			
<b>Overall</b>	1.03 (1.03-1.03)	1.02 (1.02-1.03)	1.00 (1.00-1.01)
<b>LDO</b>			
Davita	1.04 (1.03-1.04)	1.03 (1.02-1.04)	1.01 (1.00-1.01)
Fresenius	1.05 (1.04-1.05)	1.04 (1.03-1.04)	1.01 (1.00-1.01)
DCI	0.97 (0.95-0.99)	0.97 (0.95-0.99)	0.96 (0.95-0.98)
<b>SDO</b>	1.01 (1.00-1.02)	1.01 (1.00-1.02)	0.98 (0.97-0.99)
<b>Hospital-based</b>	1.04 (1.03-1.05)	1.02 (1.01-1.03)	1.06 (1.05-1.08)
<b>Independent</b>	1.00 (0.99-1.01)	1.00 (0.99-1.00)	0.99 (0.98-1.00)
<b>Black/African American patients</b>			
<b>Overall</b>	1.03 (1.02-1.03)	1.01 (1.01-1.01)	0.98 (0.97-0.98)
<b>LDO</b>			
Davita	1.04 (1.03-1.04)	1.01 (1.00-1.01)	0.98 (0.97-0.98)
Fresenius	0.99 (0.99-1.00)	0.98 (0.97-0.98)	0.94 (0.94-0.95)
DCI	0.87 (0.85-0.89)	0.86 (0.84-0.88)	0.85 (0.83-0.87)
<b>SDO</b>	1.09 (1.08-1.10)	1.09 (1.08-1.11)	1.03 (1.02-1.04)
<b>Hospital-based</b>	1.18 (1.16-1.19)	1.18 (1.16-1.19)	1.20 (1.18-1.22)
<b>Independent</b>	1.02 (1.01-1.04)	1.03 (1.01-1.04)	1.00 (0.99-1.01)
<b>Hispanic patients</b>			
<b>Overall</b>	0.95 (0.94-0.96)	0.91 (0.91-0.92)	0.91 (0.90-0.91)
<b>LDO</b>			
Davita	0.92 (0.91-0.93)	0.90 (0.89-0.91)	0.89 (0.88-0.90)
Fresenius	0.97 (0.96-0.98)	0.91 (0.90-0.92)	0.91 (0.90-0.92)
DCI	0.87 (0.82-0.91)	0.85 (0.80-0.89)	0.84 (0.80-0.89)
<b>SDO</b>	0.93 (0.91-0.94)	0.89 (0.88-0.91)	0.87 (0.86-0.88)
<b>Hospital-based</b>	1.06 (1.03-1.09)	1.05 (1.03-1.08)	1.11 (1.08-1.14)
<b>Independent</b>	0.97 (0.96-0.99)	0.93 (0.92-0.95)	0.94 (0.93-0.96)

Data source: Special analyses, USRDS ESRD Database. Period prevalent dialysis patients with Medicare as primary payer; 95% confidence intervals are shown in parentheses. Adjusted for patient age, race, ethnicity, sex, diabetes, duration of ESRD, nursing home status, patient comorbidities at incidence and body mass index (BMI) at incidence. The White- and Black-specific measures are adjusted for all the above characteristics except patient race. The Hispanic-specific measure is adjusted for all the above characteristics except patient ethnicity. Abbreviations: DCI, Dialysis Clinic, Inc.; LDO, large dialysis organizations; SDO, small dialysis organizations.

Compared with the overall dialysis population, the decrease in SHR between 2010 and 2012 was of greater magnitude in the Black/African American population (Table 8.2). Among Black/African American patients, overall SHR decreased significantly by 4.8 percent, whereas all dialysis patients experienced a 3.5 percent decrease. SHRs for Black/African American patients increased significantly by 2.2 percent in hospital-based units. In 2012, SHR was greater than one for Black/African American patients in SDO and hospital-based units, and less than one in DaVita, Fresenius, and DCI facilities.

Compared with the overall dialysis population, the decrease in SHR between 2010 and 2012 was also of greater magnitude in the Hispanic population (Table 8.2). Among Hispanic patients, overall SHR decreased significantly by 4.4 percent, whereas all dialysis patients experienced a 3.5 percent decrease. SHR for Hispanic patients increased significantly in hospital-based units, by 4.7 percent. Patients treated by all other provider types experienced decreases in SHR. In 2012, SHR was greater than one for Hispanic patients only in hospital-based providers, and less than one in all other provider groups.

