

## Introduction

- According to the 2012 United States Renal Data System (USRDS) report, during the year 2010 116,946 patients began dialysis therapy to treat end-stage renal disease (ESRD).<sup>1</sup> During the first 2 months of dialysis, these incident ESRD patients are at the greatest risk of death. For the year 2009 all-cause mortality in incident hemodialysis patients reached 435 deaths per 1,000 patient years at month 2 but fell to 206 deaths per 1,000 patient years at month 12.<sup>1</sup>
- It is these high mortality rates following the initiation of dialysis that are of greatest concern to health care providers, and nephrology care prior to initiation of dialysis therapy has been shown to improve mortality in this vulnerable patient group.<sup>2</sup> Patients who receive predialysis care can be educated about their kidney disease, and potentially undergo surgical placement of an arteriovenous fistula (AVF) so that it is mature and ready for use at initiation of hemodialysis.
- In 2005, the Centers for Medicare and Medicaid (CMS) introduced the Medical Evidence form 2728 which includes question fields to collect information regarding patients' predialysis care. Data from the 2728 form demonstrated that during 2010, 80% of incident hemodialysis patients initiated treatment with a venous catheter and 16% started with an AVF, while 3.2% began dialysis with an arteriovenous graft (AVG) in place.<sup>1</sup> Another finding was that of patients receiving predialysis care for more than 1 year, 54% started dialysis with a catheter and 26% started their therapy with an AVF.<sup>1</sup> In contrast, 43% of new ESRD patients had not seen a nephrologist prior to beginning therapy.<sup>1</sup> Among these patients, 89% began hemodialysis therapy with a catheter, 13% had a maturing AVF in place, and only 3% had a mature AVF in place.<sup>1</sup>
- In addition to vascular access and predialysis care, the influence of dialysis provider on patient outcomes has been studied. Some reports have suggested that there is no relationship between dialysis center profit status and patient survival,<sup>3</sup> while others have suggested that there is.<sup>4</sup> The 2012 USRDS annual dialysis report states that while all-cause mortality rates are similar between large dialysis organizations, small dialysis organizations, and independent dialysis organizations, there is a meaningful difference when compared by profit status.
- We conducted the current study to better understand predialysis care and vascular access status in incident patients receiving care at nonprofit and for-profit dialysis centers.

## Objective

The objective of this study was to evaluate potential differences between for-profit and nonprofit dialysis providers that could affect patient outcomes. We studied patient access to predialysis care and vascular access at the time of dialysis initiation.

## Methods

- CMS Medical Evidence form 2728 was used to determine vascular access and time and length of predialysis care in incident patients. This information was used with data on USRDS Medicare patients, which are aggregated to the facility level in Dialysis Facility Reports (DFR), to evaluate the effect of type of facility ownership on both AVF placement and predialysis care in patients starting dialysis at a for-profit large dialysis organization versus the largest nonprofit dialysis organization. Using United States federal claims data and DFRs from 2011 (reflecting data from prior years), we determined the length of time that predialysis care was received before starting dialysis and the percentage of incident patients who started dialysis with an AVF in place.

## Results

**Table 1a. Demographics—Pooled Organizations Comparison**

	Profit		Nonprofit	
	N	%	N	%
All	499,499		151,096	
Female	226,142	45.27%	67,812	44.88%
Race				
White	275,163	55.09%	83,589	55.32%
Black	194,174	38.87%	56,776	37.58%
Asian	21,319	4.27%	6,549	4.33%
Dual eligible	177,126	35.46%	51,821	34.30%

**Table 1b. Demographics—Large Dialysis Organization Comparison**

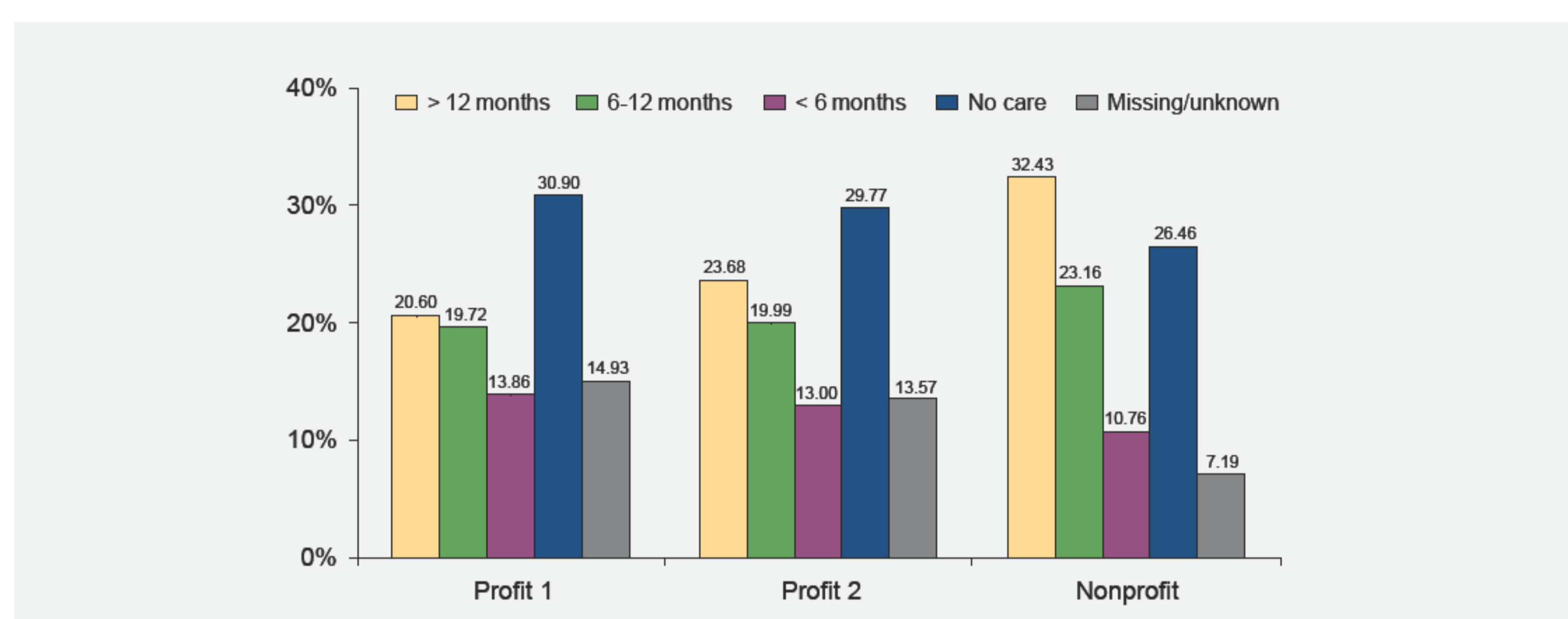
	Profit 1	Profit 2	Nonprofit 1
	N (%)	N (%)	N (%)
All	221,642 (100)	257,003 (100)	38,843 (100)
Female	99,313 (44.81)	118,403 (46.07)	17,844 (45.94)
Race			
White	119,254 (53.80)	134,961 (52.51)	19,137 (49.27)
Black	86,810 (39.17)	109,836 (42.74)	17,913 (46.12)
Asian	10,272 (4.63)	8,393 (3.27)	838 (2.16)
Dual eligible	80,390 (36.27)	91,622 (35.65)	14,248 (36.68)

- Demographic information for patients treated in 2009 is provided in Table 1. Table 1a represents pooled data from individual dialysis provider organizations according to profit and nonprofit status. Table 1b is a subset of those data for 2 large for-profit dialysis organizations and 1 large nonprofit organization.
- Comparisons for pooled organizations and single large dialysis organizations appear similar in breakdown for sex, race, and the percentage of patients qualifying for both Medicare and Medicaid (dually eligible patients).

## Results

- In pooled nonprofit facilities, during 2010 30% of patients who initiated dialysis did so after receiving greater than 12 months of predialysis care, compared to only 25% of patients who started dialysis at for-profit facilities.
- In pooled nonprofit facilities, during 2010 19.6% of patients initiated dialysis with an AVF in place, compared to only 17.1% of those who entered dialysis in for-profit facilities.
- Figure 1 describes the length of patients' predialysis care at 2 large for-profit dialysis organizations compared to the largest nonprofit dialysis organization.
- Predialysis care varied considerably across the 3 providers studied. The percentages of patients receiving no care prior to dialysis initiation were 30.90% and 29.77% for the 2 for-profit organizations analyzed, while 26.46% of patients starting dialysis at a nonprofit organization had no predialysis care. Of patients starting dialysis at the 2 for-profit organizations, 20.60% and 23.68% benefited from > 1 year of predialysis care, whereas 32.43% of patients starting dialysis at a nonprofit organization received > 1 year of predialysis care.

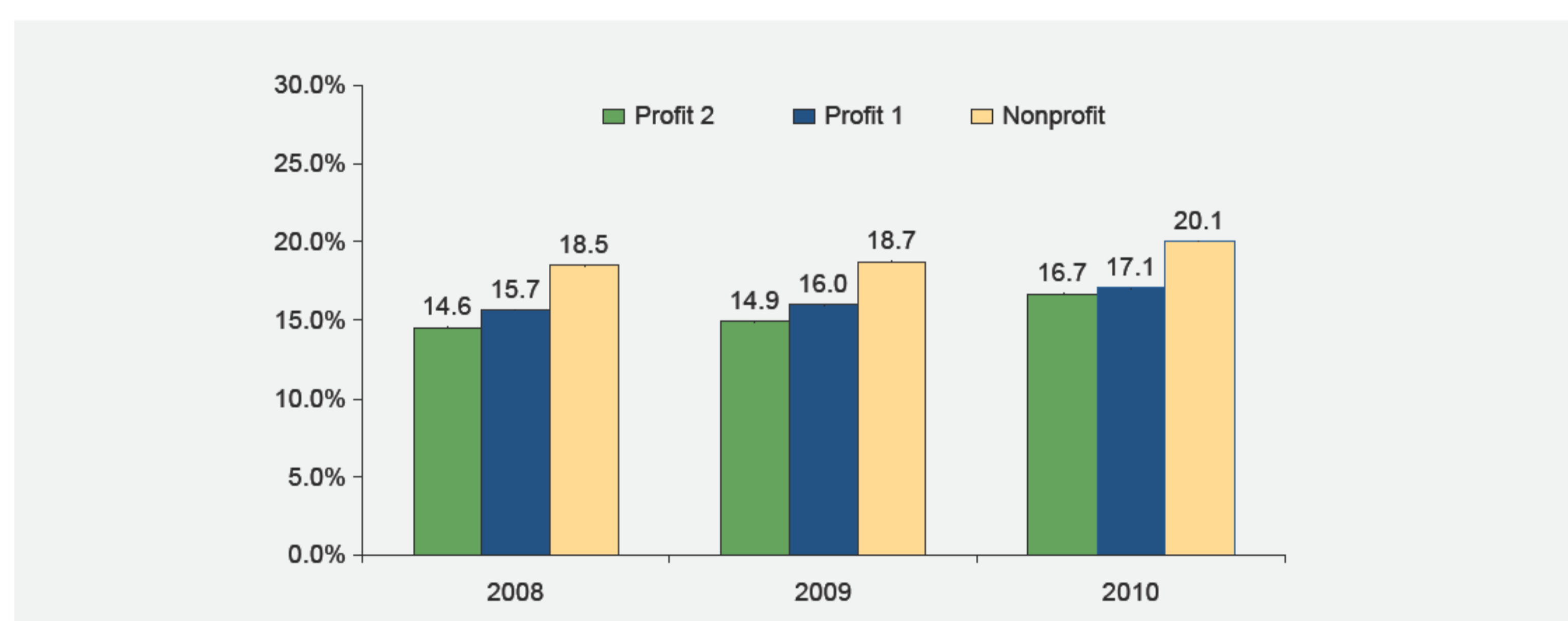
**Figure 1. Length of Predialysis Care for Incident Patients**



Incident patients 2009

- Figure 2 describes the percentage of incident patients who began dialysis with an AVF during the years 2008, 2009, and 2010. The percentage of incident patients with an AVF in place increased each year across each dialysis organization, and was consistently greatest in the nonprofit dialysis organization studied.
- The greatest difference in AVF use at first dialysis treatment was seen in 2010: for the nonprofit organization AVFs were in place for 20.1% of patients compared to only 17.1% and 16.7% of patients at the large for-profit organizations. For 2009 and 2008, the difference between AVF use in the large nonprofit organization and in the highest achieving for-profit organization (No. 1) was 2.7% and 2.2%, respectively.
- Additional studies will be necessary to determine whether the disparity between nonprofit and profit organizations in optimal vascular access for incident patients has continued to widen.

**Figure 2. Patients With AVF at First Dialysis Treatment**



## Conclusions

- Compared to patients who start dialysis at for-profit facilities, those who start at nonprofit facilities are more likely to have received prolonged predialysis care and initiate dialysis with an AVF in place. This finding calls into question the reliability of previous reports comparing patient mortality by type of provider ownership.
- Given the strong influence of predialysis care on dialysis patient outcomes, this confounder may help explain the different mortality rates by profit status reported in the 2012 USRDS ADR.
- Further exploration of the effects of length of predialysis care and vascular access placement may provide greater insight into comparisons of provider-level quality of care.

## References

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