

Supplemental Material

Appendix A: Facility Matching for CEC Model

Facilities participating in CEC Model were matched to a pool of potential comparison facilities by implementing a one-to-one propensity score matching (PSM) without replacement model. Prior to estimating the PSM model, we evaluated and applied a series of eligibility criteria to determine whether the dialysis facility could be included in the matching model.¹ A total of 1,037 ESCO facilities and 3,931 potential comparison facilities were included in the matching model.

We explored many options for matching methods, including Mahalanobis distance, coarsened exact matching, entropy balancing, and PSM.² Ultimately, we selected the PSM approach because of its ability to match on many characteristics and it performed the best according to multiple balance diagnostic tests. Means, standard deviations, and standardize mean differences (SMDs) of matching market and facility covariates are described in exhibit 1. After matching, SMDs for the selected comparison group facilities relative to CEC participating facilities were generally small. Specifically, the average SMD decreased from 0.21 before matching to 0.10 after matching.

Exhibit 1: Means and SMD for Variables Included in the Matching Model

Characteristics		1. CEC Participating Facilities (N=1,037)		2. Non-CEC Comparison Pool (N=3,931)		3. Std Diff Before Matching	4. Selected Comparison Group Facilities (N=1,037)		5. Std Diff After Matching
		Mean	Std Dev	Mean	Std Dev		Mean	Std Dev	
<i>Market Characteristics</i>	ESRD Beneficiary Population >350 Indicator	0.94	0.24	0.79	0.40	0.44*	0.88	0.32	0.20*
	Percent 65 and Older	0.13	0.02	0.13	0.03	-0.20*	0.13	0.03	-0.24*
	Percent Race White	0.60	0.15	0.63	0.19	-0.16	0.62	0.18	-0.12
	Percent Race Black	0.18	0.11	0.14	0.11	0.36*	0.16	0.12	0.16

¹ Criteria included: available claims data, data for matching characteristics, facility within the contiguous U.S. Additionally, comparison pool facilities were removed if an ESCO from their organization was operating in the same Medicare Core-Based Statistical Area.

² Stuart, E.A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical science: a review journal of the Institute of Mathematical Statistics*, 25(1), 1-21.

Characteristics	1. CEC Participating Facilities (N=1,037)		2. Non-CEC Comparison Pool (N=3,931)		3. Std Diff Before Matching	4. Selected Comparison Group Facilities (N=1,037)		5. Std Diff After Matching
	Mean	Std Dev	Mean	Std Dev		Mean	Std Dev	
Percent No High School Diploma	0.14	0.04	0.15	0.05	-0.13	0.14	0.04	-0.06
Percent Single Parent Households with Children	0.34	0.05	0.34	0.06	0.06	0.34	0.06	-0.08
Percent ESRD	0.00	0.00	0.00	0.00	0.03	0.00	0.00	-0.05
Percent Duals	0.03	0.01	0.03	0.01	-0.24*	0.03	0.01	-0.24*
Percent ESRD Duals	0.50	0.08	0.52	0.10	-0.17	0.51	0.10	-0.09
Median Household Income	\$54,688	\$10,149	\$52,323	\$10,549	0.23*	\$52,650	\$11,880	0.18
Medicare Advantage (MA) Penetration (percent)	0.28	0.15	0.28	0.13	0.00	0.28	0.12	-0.02
PCPs per 10,000	7.64	1.48	7.63	1.71	0.01	7.71	1.6	-0.05
SNF Beds per 10,000	48.36	18.92	51.09	20.59	-0.14	51.2	20.24	-0.15
Specialists per 10,000	11.14	4.6	10.17	4.65	0.21*	10.7	4.69	0.09
Hospitals with Kidney Transplant Services per 10,000	0.01	0.01	0.01	0.01	0.02	0.01	0.01	-0.03
Rural Indicator	0.14	0.34	0.16	0.36	-0.06	0.18	0.38	-0.11
Extra-Rural Indicator	0.01	0.12	0.05	0.22	-0.22*	0.02	0.15	-0.06

Characteristics		1. CEC Participating Facilities (N=1,037)		2. Non-CEC Comparison Pool (N=3,931)		3. Std Diff Before Matching	4. Selected Comparison Group Facilities (N=1,037)		5. Std Diff After Matching
		Mean	Std Dev	Mean	Std Dev		Mean	Std Dev	
<i>Facility Characteristics</i>	Number of Dialysis Stations	19.98	7.68	18.33	7.67	0.21*	19.6	7.79	0.05
	Late Shift Indicator	0.21	0.40	0.18	0.39	0.06	0.21	0.41	-0.01
	Peritoneal Indicator	0.48	0.50	0.60	0.49	-0.25*	0.54	0.50	-0.13
	Percent Hemodialysis	0.96	0.09	0.95	0.09	0.16	0.96	0.08	0.05
	Percent Peritoneal Dialysis	0.06	0.11	0.08	0.12	-0.18	0.07	0.10	-0.05
	Percent Patients with Vascular Catheter	0.10	0.06	0.11	0.07	-0.17	0.11	0.06	-0.16
	Percent Patients with AV Fistula	0.62	0.11	0.64	0.11	-0.11	0.63	0.10	-0.07
	SHR	1.0	0.26	0.99	0.27	0.05	1.01	0.26	-0.02
	SRR	0.96	0.29	0.97	0.3	-0.03	0.97	0.28	-0.02
	SMR	0.97	0.24	1.01	0.28	-0.14	0.99	0.26	-0.07
	DaVita Indicator	0.10	0.30	0.45	0.50	-0.85*	0.23	0.42	-0.34*
	DCI Indicator	0.07	0.26	0.03	0.17	0.20*	0.07	0.26	0.00
	Fresenius Indicator	0.80	0.40	0.23	0.42	1.38*	0.67	0.47	0.30*
	Total Medicare Part A and Part B PBPM (2012-2014)	\$6,577	\$931	\$6,497	\$1,160	0.08	\$6,547	\$1,079	0.03

Characteristics	1. CEC Participating Facilities (N=1,037)		2. Non-CEC Comparison Pool (N=3,931)		3. Std Diff Before Matching	4. Selected Comparison Group Facilities (N=1,037)		5. Std Diff After Matching
	Mean	Std Dev	Mean	Std Dev		Mean	Std Dev	
Percent Ever Crashed into Dialysis	0.45	0.12	0.46	0.15	-0.06	0.45	0.13	0.04
Percent New to Dialysis	0.10	0.06	0.12	0.09	-0.31*	0.11	0.06	-0.15
Facility CBSA PBPM Ratio	1.01	0.12	1.02	0.15	-0.04	1.01	0.14	0.00

Notes: The standardized difference is calculated by the following equation: $Std. Diff = (\mu_1 - \mu_2) / \sqrt{(\sigma_1^2 + \sigma_2^2) / 2}$ Any value below 0.1 is considered to be a negligible difference.

* Indicates a standardized mean difference greater than 0.2 in absolute value.