Web-based Supplementary material for *Evaluating Center Performance in the Competing Risks Setting*

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In this Appendix we present an expanded version of simulation results presented in Table 3 of the main manuscript, a tabulation of the results mentioned in Section 5 and a scatter plot of the estimated center-specific random effects and ECIs of the two outcomes - transplantation and death - for the data analysis detailed in Section 5.

Table 1 in this document compares the proposed method to a method ignoring the correlation between cause-specific random effects within a center with respect to Bias, Empirical Standard Deviation, Asymptotic Standard Error and Coverage Probability of center effect estimates.

Table 2 in this document compares the proposed method to a method that ignores the correlation between the cause-specific center effects with respect to outlier classification.

Figure 1 contains two scatterplots. Above is a scatterplot of the center-specific random effects for cause 1 (Transplantation) and cause 2. Below is a scatterplot of the ECI for cause 1 (Transplantation) and ECI for cause 2

Table 1: Estimating Center-Specific Effects: Results from 500 Simulated Datasets

			Proposed Method				Ignornig Random Effects Correlation			
$n_{j'}$		True Value	Bias	ESD	ASE	CP	Bias	ESD	ASE	CP
20	$\gamma_{j'1}$	0.0	-0.022	0.234	0.324	0.985	-0.027	0.246	0.337	0.995
	$\gamma_{j'2}$	0.0	-0.013	0.243	0.306	0.975	-0.018	0.253	0.315	0.975
	$\gamma_{j'1}$	0.5	-0.175	0.241	0.298	0.965	-0.217	0.249	0.310	0.965
	$\gamma_{j'2}$	-0.5	0.172	0.249	0.328	0.975	0.227	0.250	0.337	0.940
	$\gamma_{j'1}$	1.0	-0.276	0.243	0.277	0.880	-0.326	0.249	0.285	0.825
	$\gamma_{j'2}$	-1.0	0.403	0.243	0.355	0.835	0.566	0.233	0.363	0.680
40	$\gamma_{j'1}$	0.0	-0.011	0.226	0.264	0.985	-0.016	0.237	0.273	0.990
	$\gamma_{j'2}$	0.0	-0.008	0.208	0.243	0.985	-0.012	0.213	0.250	0.980
	$\gamma_{j'1}$	0.5	-0.098	0.214	0.233	0.940	-0.129	0.222	0.240	0.925
	$\gamma_{j'2}$	-0.5	0.112	0.217	0.271	0.970	0.155	0.227	0.278	0.935
	$\gamma_{j'1}$	1.0	-0.139	0.204	0.208	0.910	-0.177	0.210	0.214	0.890
	$\gamma_{j'2}$	-1.0	0.265	0.220	0.307	0.920	0.406	0.226	0.313	0.780
60	$\gamma_{j'1}$	0.0	-0.003	0.197	0.231	0.970	-0.008	0.205	0.237	0.965
	$\gamma_{j'2}$	0.0	-0.006	0.188	0.210	0.975	-0.009	0.193	0.214	0.980
	$\gamma_{j'1}$	0.5	-0.057	0.196	0.199	0.965	-0.084	0.199	0.204	0.965
	$\gamma_{j'2}$	-0.5	0.065	0.213	0.241	0.960	0.100	0.214	0.245	0.935
	$\gamma_{j'1}$	1.0	-0.091	0.169	0.178	0.955	-0.122	0.172	0.181	0.920
	$\gamma_{j'2}$	-1.0	0.218	0.217	0.276	0.880	0.333	0.219	0.281	0.800
80	$\gamma_{j'1}$	0.0	-0.015	0.175	0.209	0.995	-0.024	0.183	0.215	0.995
	$\gamma_{j'2}$	0.0	-0.022	0.178	0.191	0.970	-0.028	0.185	0.194	0.965
	$\gamma_{j'1}$	0.5	-0.071	0.177	0.180	0.960	-0.095	0.183	0.184	0.950
	$\gamma_{j'2}$	-0.5	0.065	0.181	0.218	0.970	0.089	0.186	0.222	0.965
	$\gamma_{j'1}$	1.0	-0.107	0.160	0.161	0.895	-0.134	0.164	0.163	0.855
	$\gamma_{j'2}$	-1.0	0.195	0.198	0.255	0.920	0.283	0.202	0.259	0.810
100	$\gamma_{j'1}$	0.0	-0.026	0.164	0.195	0.990	-0.036	0.171	0.199	0.985
	$\gamma_{j'2}$	0.0	-0.018	0.154	0.176	0.980	-0.025	0.159	0.179	0.970
	$\gamma_{j'1}$	0.5	-0.081	0.147	0.167	0.965	-0.103	0.150	0.170	0.945
	$\gamma_{j'2}$	-0.5	0.058	0.200	0.203	0.925	0.077	0.207	0.206	0.915
	$\gamma_{j'1}$	1.0	-0.099	0.137	0.149	0.930	-0.124	0.141	0.151	0.885
	$\gamma_{j'2}$	-1.0	0.157	0.191	0.241	0.945	0.232	0.196	0.245	0.890

Table 2: Analysis of Scientific Registry of Transplant Recipients (SRTR) Data: Comparing Classification of Organ Procurement Organizations (OPOs) based on Excess Cumulative Incidence (ECI) of Death and Kidney Transplantation

Classification of OPOs Ignornig Correlation of Random Effects	Classification of OPOs Using Proposed Method					
	Based on ECI of Transplant			Based on ECI of Death		
	Low Outlier	Not an Outlier	High Outlier	Low Outlier	Not an Outlier	High Outlier
Low Outlier	17	1	0	16	1	0
Not an Outlier	0	24	2	5	23	1
High Outlier	0	1	13	0	0	12

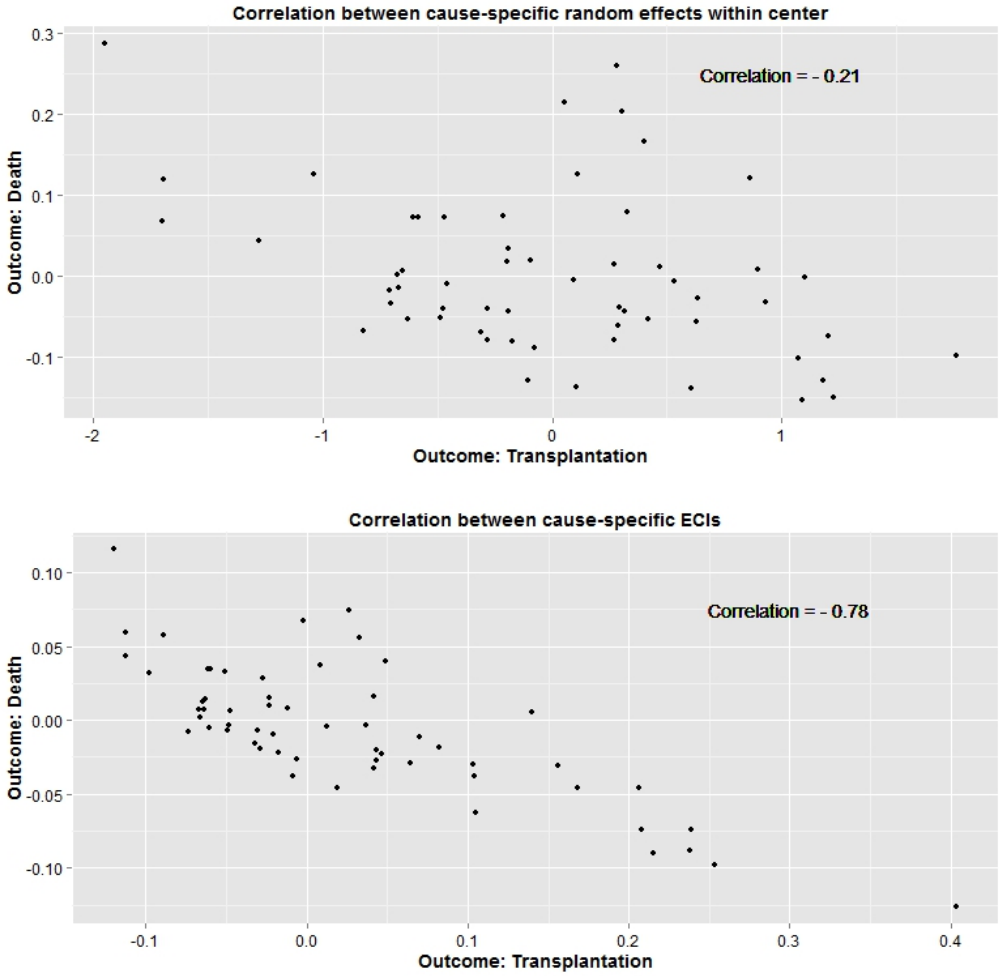

Figure 1: Scatter Plots of center-specific random effects (above) and Excess Cause-specific Cumuluative Incidence (below) for the outcomes of Transplant and Death for 58 OPOs