

CBE 0369: Standardized Mortality Ratio for Dialysis Facilities

5.4.4 Risk/Case-Mix Adjustment Modeling and/or Stratification Results

Please see section 5.4.6 for a list of the final set of risk factors used in the model.

Covariate	Coefficient	P-value	Hazard Ratio
Age	-0.010	0.6957	N/A*
Age spline at 14 (0 for pts <= 14, number of years older than 14 if pt is >14)	0.029	0.2523	N/A*
Age spline at 60 (0 for pts <=60, number of years older than 60 if pt is > 60)	0.013	<.0001	N/A*
Cause of ESRD Missing	0.145	0.0828	1.16
Black * Age	-0.007	0.8737	N/A*
Black * Age spline at 14	0.005	0.9184	N/A*
Black * Age spline at 60	0.001	0.2939	N/A*
Patient in a Nursing Home <90 days in last 365 days	0.562	<.0001	1.75
Patient in a Nursing Home 90 days or more in last 365 days	0.480	<.0001	1.62
BMI: Underweight	0.284	<.0001	1.33
BMI: Normal	0.126	<.0001	1.14
BMI: Overweight	0.034	<.0001	1.04
Race: Other	0.008	0.8948	N/A*
Race: Black	-0.131	0.8393	N/A*

Covariate	Coefficient	P-value	Hazard Ratio
Race: Asian/PI	-0.274	<.0001	N/A*
Race: Native American	-0.296	<.0001	N/A*
Vintage: Less than 1 year	-0.430	<.0001	N/A*
Vintage: 1 to 2 years	-0.255	<.0001	N/A*
Vintage: 2 to 3 years	-0.175	<.0001	N/A*
Female	-0.063	<.0001	N/A*
Diabetes	0.151	<.0001	N/A*
Hispanic	-0.246	<.0001	N/A*
Unknown Ethnicity	0.055	0.6113	N/A*
Unknown Ethnicity * Nonwhite	-0.284	0.0375	N/A*
Hispanic * Nonwhite	0.126	<.0001	N/A*
Race: Asian/PI * Diabetes	0.048	0.0053	N/A*
Race: Black * Diabetes	-0.067	<.0001	N/A*
Race: Native American * Diabetes	0.092	0.019	N/A*
Race: Other * Diabetes	0.079	0.2729	N/A*
Vintage: Less than 1 year * Diabetes	-0.155	<.0001	N/A*
Vintage: 1 to 2 years * Diabetes	-0.099	<.0001	N/A*
Vintage: 2 to 3 years * Diabetes	-0.036	0.0025	N/A*

Covariate	Coefficient	P-value	Hazard Ratio
Vintage: Less than 1 year * Race: Asian/PI	-0.106	<.0001	N/A*
Vintage: Less than 1 year * Race: Black	0.024	0.0337	N/A*
Vintage: Less than 1 year * Race: Native American	-0.027	0.5433	N/A*
Vintage: Less than 1 year * Race: Other	0.106	0.1732	N/A*
Race: Black * Female	0.055	<.0001	N/A*
Incident Comorbidity: Atherosclerotic heart disease	0.047	<.0001	1.05
Incident Comorbidity: Other cardiac disease	0.043	<.0001	1.04
Incident Comorbidity: Congestive heart failure	0.085	<.0001	1.09
Incident Comorbidity: Inability to ambulate	0.084	<.0001	1.09
Incident Comorbidity: Chronic obstructive pulmonary disease	0.034	<.0001	1.04
Incident Comorbidity: Inability to transfer	0.041	0.0019	1.04
Incident Comorbidity: Malignant neoplasm, cancer	0.045	<.0001	1.05
Incident Comorbidity: Diabetes (all types including cause of ESRD)	0.037	<.0001	1.04
Incident Comorbidity: Peripheral vascular disease	0.057	<.0001	1.06
Incident Comorbidity: Cerebrovascular disease, CVA, TIA	0.013	0.0551	1.01
Incident Comorbidity: Tobacco use (current smoker)	0.139	<.0001	1.15
Incident Comorbidity: Alcohol dependence	-0.008	0.6506	0.99
Incident Comorbidity: Drug dependence	0.060	0.0009	1.06

Covariate	Coefficient	P-value	Hazard Ratio
Incident Comorbidity: At least one of the incident comorbidities listed	0.085	<.0001	1.09
Incident Comorbidity: No Medical Evidence (CMS-2728) Form	0.175	0.0469	1.19
Prevalent Comorbidity: CCS Group 1: Candidal esophagitis	0.168	<.0001	1.18
Prevalent Comorbidity: CCS Group 2: Sarcoidosis	0.037	0.1365	1.04
Prevalent Comorbidity: CCS Group 3: Cancer of Liver	0.646	<.0001	1.91
Prevalent Comorbidity: CCS Group 4: Cancer of Lung	0.495	<.0001	1.64
Prevalent Comorbidity: CCS Group 5: Cancer of Prostate	-0.094	<.0001	0.91
Prevalent Comorbidity: CCS Group 6: Cancer of Bladder	0.199	<.0001	1.22
Prevalent Comorbidity: CCS Group 7: Cancer of Kidney	-0.034	0.0173	0.97
Prevalent Comorbidity: CCS Group 8: Cancer of Bone	0.626	<.0001	1.87
Prevalent Comorbidity: CCS Group 9: Other Neoplasm	0.145	<.0001	1.16
Prevalent Comorbidity: CCS Group 10: Non-Hodgkins Lymphoma	0.171	<.0001	1.19
Prevalent Comorbidity: CCS Group 11: Multiple Myeloma	0.135	<.0001	1.15
Prevalent Comorbidity: CCS Group 12: Chronic lymphoid leukemia	0.243	<.0001	1.28
Prevalent Comorbidity: CCS Group 13: Myelodysplastic Syndrome	0.166	<.0001	1.18
Prevalent Comorbidity: CCS Group 14: Essential Thrombocytopenia	0.042	0.1004	1.04

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 15: Diabetes without complications	-0.029	<.0001	0.97
Prevalent Comorbidity: CCS Group 16: Diabetes with complications	0.092	<.0001	1.10
Prevalent Comorbidity: CCS Group 17: Glucocorticoid deficiency	0.220	<.0001	1.25
Prevalent Comorbidity: CCS Group 18: Malnutrition / Cachexia	0.183	<.0001	1.20
Prevalent Comorbidity: CCS Group 19: Cerebral edema	0.137	<.0001	1.15
Prevalent Comorbidity: CCS Group 20: Disorders of urea cycle metabolism	0.162	<.0001	1.18
Prevalent Comorbidity: CCS Group 21: Other amyloidosis	0.043	0.0008	1.04
Prevalent Comorbidity: CCS Group 22: Other specified disorders of metabolism	-0.065	<.0001	0.94
Prevalent Comorbidity: CCS Group 23: Morbid Obesity	0.256	<.0001	1.29
Prevalent Comorbidity: CCS Group 24: Solid Organ Transplant	0.143	<.0001	1.15
Prevalent Comorbidity: CCS Group 25: Sickle-cell Anemia	0.100	<.0001	1.11
Prevalent Comorbidity: CCS Group 26: Pancytopenia	0.010	0.5342	1.01
Prevalent Comorbidity: CCS Group 27: Neutropenia	0.195	<.0001	1.22
Prevalent Comorbidity: CCS Group 28: Primary hypercoagulable state	0.057	0.035	1.06
Prevalent Comorbidity: CCS Group 29: Dementia	0.033	0.3521	1.03
Prevalent Comorbidity: CCS Group 30: Substance Related Disorders	0.104	<.0001	1.11

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 31: Infection due to urinary catheter	0.009	0.6545	1.01
Prevalent Comorbidity: CCS Group 32: HIV	0.032	0.0622	1.03
Prevalent Comorbidity: CCS Group 33: Gastrostomy status	-0.075	0.0614	0.93
Prevalent Comorbidity: CCS Group 34: Long-term (current) use of insulin	-0.013	0.4221	0.99
Prevalent Comorbidity: CCS Group 35: Miscellaneous Mental Health	0.085	<.0001	1.09
Prevalent Comorbidity: CCS Group 36: Opioid Dependence	0.045	0.0005	1.05
Prevalent Comorbidity: CCS Group 37: Schizophrenia	0.062	<.0001	1.06
Prevalent Comorbidity: CCS Group 38: Cerebral degeneration, unspecified	0.024	0.1049	1.02
Prevalent Comorbidity: CCS Group 39: Peripheral autonomic neuropathy in disorders classified elsewhere	0.031	0.0608	1.03
Prevalent Comorbidity: CCS Group 40: Unspecified hereditary and idiopathic peripheral neuropathy	0.240	<.0001	1.27
Prevalent Comorbidity: CCS Group 41: Epilepsy	0.270	<.0001	1.31
Prevalent Comorbidity: CCS Group 42: Bipolar Disorder	-0.151	<.0001	0.86
Prevalent Comorbidity: CCS Group 43: Major depressive affective disorder	0.014	0.0347	1.01
Prevalent Comorbidity: CCS Group 44: Mood Disorders	0.194	<.0001	1.21
Prevalent Comorbidity: CCS Group 45: Alcohol Related Disorders	0.074	<.0001	1.08

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 46: Coma	0.057	<.0001	1.06
Prevalent Comorbidity: CCS Group 47: Hip and Femur Fracture	0.041	0.0243	1.04
Prevalent Comorbidity: CCS Group 48: Critical illness myopathy	0.177	<.0001	1.19
Prevalent Comorbidity: CCS Group 49: hypertensive heart disease with heart failure	0.161	<.0001	1.18
Prevalent Comorbidity: CCS Group 50: Myocardial Infarction	0.115	<.0001	1.12
Prevalent Comorbidity: CCS Group 51: Coronary Atherosclerosis	0.167	<.0001	1.18
Prevalent Comorbidity: CCS Group 52: pulmonary embolism and infarction	0.187	<.0001	1.21
Prevalent Comorbidity: CCS Group 53: Primary pulmonary hypertension	0.042	<.0001	1.04
Prevalent Comorbidity: CCS Group 54: Pulmonary Heart Disease	-0.026	<.0001	0.98
Prevalent Comorbidity: CCS Group 55: Cardiomyopathy	0.063	<.0001	1.07
Prevalent Comorbidity: CCS Group 56: Atrioventricular block, complete	0.111	<.0001	1.12
Prevalent Comorbidity: CCS Group 57: Paroxysmal Tachycardia	0.046	0.0122	1.05
Prevalent Comorbidity: CCS Group 58: Atrial fibrillation	0.067	<.0001	1.07
Prevalent Comorbidity: CCS Group 59: Atrial flutter	0.169	<.0001	1.18
Prevalent Comorbidity: CCS Group 60: Sinoatrial node dysfunction	0.063	<.0001	1.07
Prevalent Comorbidity: CCS Group 61: Acute Cerebrovascular Disease	0.105	<.0001	1.11

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 62: Peripheral and Visceral Atherosclerosis	0.124	<.0001	1.13
Prevalent Comorbidity: CCS Group 63: Aortic and Peripheral Artery Aneurysm	0.022	0.007	1.02
Prevalent Comorbidity: CCS Group 64: Venous Thromboembolism	0.212	<.0001	1.24
Prevalent Comorbidity: CCS Group 65: Esophageal varices	0.033	0.0891	1.03
Prevalent Comorbidity: CCS Group 66: Chronic Obstructive Pulmonary Disease	0.029	0.0031	1.03
Prevalent Comorbidity: CCS Group 67: Asthma	0.310	<.0001	1.36
Prevalent Comorbidity: CCS Group 68: Aspiration Pneumonitis	0.226	<.0001	1.25
Prevalent Comorbidity: CCS Group 69: Other Lower Respiratory Diseases	0.144	<.0001	1.16
Prevalent Comorbidity: CCS Group 70: Respiratory Failure	0.260	<.0001	1.30
Prevalent Comorbidity: CCS Group 71: Enteritis and Ulcerative Colitis	0.122	<.0001	1.13
Prevalent Comorbidity: CCS Group 72: Ileus and Intestinal Obstruction	-0.074	<.0001	0.93
Prevalent Comorbidity: CCS Group 73: Cirrhosis of Liver	0.067	<.0001	1.07
Prevalent Comorbidity: CCS Group 74: Other Liver Disease	0.132	<.0001	1.14
Prevalent Comorbidity: CCS Group 75: Pancreatitis	0.028	0.2843	1.03
Prevalent Comorbidity: CCS Group 76: Chronic Skin Ulcer	-0.060	<.0001	0.94

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 77: Systemic lupus erythematosus and connective tissue disorders	0.170	<.0001	1.19
Prevalent Comorbidity: CCS Group 78: Infective arthritis and osteomyelitis	0.023	0.212	1.02
Prevalent Comorbidity: CCS Group 79: Aseptic Necrosis	0.092	<.0001	1.10
Prevalent Comorbidity: CCS Group 80: Rheumatoid Arthritis	-0.054	0.0025	0.95
Prevalent Comorbidity: CCS Group 81: Pathologic Fracture	0.013	0.3905	1.01
Prevalent Comorbidity: CCS Group 82: Gangrene	-0.016	0.27	0.98
Prevalent Comorbidity: CCS Group 83: Other toe(s) amputation status	0.058	0.0282	1.06
Prevalent Comorbidity: CCS Group 84: Below knee amputation status	0.031	0.019	1.03
Prevalent Comorbidity: CCS Group 85: Ileostomy / Colostomy Status	-0.022	0.0199	0.98
Prevalent Comorbidity: CCS Group 86: Above knee amputation status	0.108	<.0001	1.11
Prevalent Comorbidity: CCS Group 87: Other artificial opening of urinary tract status	0.094	<.0001	1.10
Prevalent Comorbidity: CCS Group 88: Dependence on respirator, status	0.038	<.0001	1.04
Prevalent Comorbidity: CCS Group 89: Cancer of Rectum	0.251	<.0001	1.29
Prevalent Comorbidity: CCS Group 90: Inflammatory polyarthropathy	-0.001	0.9695	1.00

Covariate	Coefficient	P-value	Hazard Ratio
Prevalent Comorbidity: CCS Group 91: Sacroiliitis	0.022	0.3315	1.02
Prevalent Comorbidity: Insufficient Medicare claims to determine prevalent comorbidities	0.538	<.0001	1.71
Medicare Advantage (MA) coverage	-0.078	<.0001	0.93
Year: 2020	0.051	<.0001	1.05
Year: 2021	0.112	<.0001	1.12
Year: 2022	0.053	<.0001	1.06
*Hazard ratios are not calculated for interaction terms or main effects of variables that have interaction terms.			

Hazard ratios are not shown for interaction terms or main effects of variables that are also included as interaction terms because caution is needed in interpreting these terms. For example, the coefficient for Vintage: less than 1 year cannot be interpreted simply as the difference in mortality risk of Vintage: less than 1 year compared to Vintage: 3 or more years (reference). It is instead the difference in risk for diabetic Vintage: less than 1 year and diabetic Vintage: 3 or more years. The difference in risk for diabetic Vintage: less than 1 year vs diabetic Vintage: 3 or more years is smaller as indicated by the negative coefficient for the diabetes by Vintage: less than 1 year interaction term.