

SUPPLEMENTAL DATA

Supplemental Figure 1: Charlson-Deyo comorbidity score. An additive score of the number of weighted comorbid conditions present at diagnosis, reported in the NCDB as 0,1, or ≥ 2 to protect patient anonymity. Adapted from: Deyo RA, Cherkin DC, Ciol MA. Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. Journal of Clinical Epidemiology 1992;45(6):613-619

Charlson-Deyo Comorbidity Score:		
Points	Condition	
1	Myocardial Infarction	Chronic Pulmonary Disease
	Congestive Heart Failure	Rheumatologic Disease
	Peripheral Vascular Disease	Peptic Ulcer Disease
	Cerebrovascular Disease	Mild Liver Disease
	Dementia	Diabetes
2	Diabetes with Complications	Renal Disease
	Hemiplegia / Paraplegia	
3+	Moderate to Severe Liver Disease	
	AIDS	

Supplemental Table 1: Proportional 1-, 5- and 10-year survival (%) by year of diagnosis for White and Black patients (N=88 680).

Supplemental Table 1:						
Year of Diagnosis	Black			White		
	1 year	5 year	10 year	1 year	5 year	10 year
2004	84	49	25	87	61	37
2005	85	49	27	86	63	40
2006	85	55	32	88	63	43
2007	83	51	30	88	65	44
2008	85	63	34	88	64	45
2009	85	61	37	88	66	45
2010	85	60	38	89	68	44
2011	87	60		89	69	
2012	86	65		91	72	
2013	88	65		91	71	
2014	92	70		92	73	
2015	89	73		92	72	
2016	91			92		
2017	86			93		
2018						

Supplemental Table 2: Cox regression adjusted by age and Charlson-Deyo comorbidity score by year of diagnosis, for Black patients, referenced to White patients (N=88 680).

Supplemental Table 2:				
	Hazard Ratio	95% Confidence Interval		P value
Year of diagnoses				
2004-2006	1.64	1.52	1.76	<0.001
2007-2009	1.49	1.39	1.61	<0.001
2010-2012	1.51	1.40	1.64	<0.001
2013-2015	1.37	1.26	1.50	<0.001
2016-2018	1.64	1.44	1.85	<0.001

Supplemental Methods and Results: Propensity Score Matched Analysis

Propensity score was determined by the conditional probability of identifying as Black race from a multivariate logistic regression model that included age, Charlson-Deyo comorbidity score, insurance, median income of zip code quartile, and median education level of zip code. These factors were chosen by their significant variation between race groups and theoretical impact on survival. White CLL patients were then 1:1 matched to Black patients, with random assignment within a 0.01 tolerance without replacement. Preference was placed on exact matches. Standardized mean difference was used to confirm balance for all individual covariates using Cramer's *V* for categorical and Cohen's *d* for continuous variables. Balance was defined as absolute mean difference <0.1, indicating small difference, which was met for all variables included in matching, and reported in Supplemental Table 3, below. Following matching, Kaplan Meier survival analysis for median overall survival was repeated. A univariate Cox regression for the risk of death for Black patients, referenced to the matched White population, was then performed.

Following 1:1 propensity score matching of White to Black patients, there was a total of 13 028 patients in the matched cohort who were evenly split, with 6 514 patients in each the White and Black group. Demographic characteristics of the matched population were similar between White and Black patients, with results with standard mean differences detailed in Supplemental Table 3. Notably, Black patients were still more likely to receive treatment at diagnosis than the matched White population (36% vs 27%), and less likely to be managed with active surveillance (37% vs 46%), $p < 0.001$. Survival analysis was repeated for the propensity score matched cohort, with a median OS of 7.5 years (95% CI 7.3-7.7 years). White patients in the matched group had a significant survival benefit, with median OS of 8.5 years (95% CI 8.1-8.9 years) compared to Black patients at 6.6 years (95% CI 6.4-6.9 years), $p < 0.001$ (Table 3). On a univariate Cox regression, the HR for mortality for Black patients, referenced to the White population, was 1.30 (95% CI 1.23-1.37, $p < 0.001$). Demonstrating that when matched for age, comorbid diagnosis, and surrogate markers of healthcare access, there remains a significant gap in survival for Black CLL patients.

Supplemental Table 3: Demographics and treatment characteristics of patient population following 1:1 propensity score matching of White to Black patients for age, Charlson-Deyo comorbidity score, insurance, and median zip code income quartile and high school graduation rate quartile (N=13 028).

Supplemental Table 3:					
	White		Black		Standard Mean Difference*
	N	%	N	%	
Total	6,514	50.0%	6,514	50.0%	
Sex ‡					
Male	4,026	61.8%	3,716	57.0%	0.048
Female	2,488	38.2% #	43	39.5%	
Age					
Mean (SD)	67.0	(11.8)	67.0	(12.1)	0.026
Median (IQR)	67	(59-76)	67	(58-76)	
Charlson-Deyo Comorbidity Index					
0	4,764	73.1%	4,661	71.6%	0.024
1	1,158	17.8%	1,169	17.9%	
>2	592	9.1%	684	10.5%	
Insurance					
Uninsured	400	6.1%	442	6.8%	0.033
Private	1,872	28.7%	1,863	28.6%	
Medicaid	578	8.9%	639	9.8%	
Medicare	3,624	55.6%	3,502	53.8%	
Government, other	40	0.6%	68	1.0%	
Median Income of Patient Zip Code					
<\$40,227	3,170	48.7%	3,091	47.5%	0.014
\$40,227-\$50,353	1,325	20.3%	1,332	20.4%	
\$50,354-\$63,332	986	15.1%	1,010	15.5%	
>=\$63,333	1,033	15.9%	1,081	16.6%	
% of Zip Code without High School Diploma					
>=17.6%	2,751	42.2%	2,671	41.0%	0.013
10.9-17.5%	2,031	31.2%	2,065	31.7%	
6.3-10.8%	1,185	18.2%	1,207	18.5%	
<6.3%	547	8.4%	571	8.8%	
Treatment Characteristics	N	%	N	%	
Systemic Treatment ‡					
Not Treated	1,140	26.9%	1,191	27.4%	0.114
Treated	1,133	26.7%	1,569	36.1%	
Active Surveillance	1,968	46.4%	1,587	36.5%	
SD: Standard Deviation; IQR: Interquartile Range					
‡ Variable not included in propensity score matching					
*Cramer's V reported for categorical variables, with Cohen's D reported for continuous variables (age); small difference considered <0.1					