

## **Sociodemographic Disparities in Survival from Localized versus Metastatic Gastric Cancer: A SEER-Based Analysis**

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**Background:** Despite decreasing incidence, gastric cancer (GC) remains the 4th leading cause of cancer-related deaths worldwide. In the United States (US), routine endoscopic screening for GC in average-risk individuals is not recommended, and most patients present with advanced disease. Five-year survival for GC decreases from 75% in localized disease to 7% in distant metastatic disease. We aimed to determine sociodemographic differences in survival rates in localized vs. metastatic GC.

**Methods:** We used 2006-2018 data from the National Cancer Institute (NCI)'s Surveillance, Epidemiology, and End Results (SEER) registry. We identified all patients 1) age  $\geq 18$ , 2) with gastric primary anatomic cancer site, 3) histologically confirmed gastric adenocarcinoma, neuroendocrine, signet ring cell, or other invasive carcinoma 4) and no other cancer diagnoses at the time. We summarized demographic and clinical features for GC patients for the study period and then used univariate and multivariable logistic regression to assess the relationship between patient clinical and sociodemographic characteristics and GC survival, stratified by disease stage.

**Results:** Overall, there were 43,752 individuals with GC (63.6% males). Mean age was  $64.1 \pm 13.6$  years. At time of diagnosis, 27% had local GC, 37% had regional metastases to lymph nodes, and 36% had distant metastatic disease (Table 1). In localized GC, age (aOR 0.98, 95%CI=0.97-0.98) and low socioeconomic status (SES) (Yost Quintile (YQ) 1; aOR 0.79, 95%CI=0.65-0.97, YQ 2; aOR 0.77, 95%CI=0.65-0.91, YQ 3; aOR 0.77, 95%CI=0.65-0.90, YQ 4; aOR 0.73, 95%CI=0.62-0.85) were associated with lower odds of GC survival. Female sex (aOR 1.51, 95%CI=1.35-1.69), married/partnered status (aOR 1.18, 95%CI=1.06-1.32), non-hispanic (NH) Asian/Pacific Islander (PI) race (aOR 1.39, 95%CI=1.19-1.62) and urban location (aOR 1.25, 95%CI=1.05-1.49) were associated with higher odds of GC survival. In distant metastatic disease, Hispanic ethnicity (aOR 1.58, 95%CI=1.41-1.78) and NH Asian/PI race (aOR 1.50, 95%CI=1.31-1.71) were associated with higher odds of survival compared to NH White race, whereas married/partnered status was associated with lower odds of survival (aOR 0.89, 95%CI=0.81-0.98) (Table 2).

Conclusion: In distant metastatic GC, overall survival rate is low, and few sociodemographic factors correlate with survival. Comparatively, in localized GC, several sociodemographic factors including younger age, female sex, SES, urbanicity and marital status are significantly associated with improved odds of survival. Our findings suggest that access to care and variations in risk factors may play a more prominent role in survival outcomes for localized GC, highlighting opportunities to address disparities in early disease.

	<b>GC Patients, Total (n=43,752)</b>	<b>GC Patients, Died (n=24,479)</b>	<b>GC Patients, Survived (n=19,273)</b>	<b>P value</b>
<b>Male Sex, n (%)</b>	27,828 (63.6)	16,066 (65.6)	11,762 (61.0)	<0.0001
<b>Age, years, mean (SD)</b>	64.1 (13.6)	64.0 (13.8)	64.3 (13.3)	0.008
<b>DTI, months, median (IQR)</b>	1 (0-2)	1 (0-1)	1 (0-2)	<0.0001
<b>Race/Ethnicity, n (%)</b>				<0.0001
<b>Non-Hispanic White</b>	22,356 (51.2)	13,097 (58.6)	9,259 (41.4)	
<b>Non-Hispanic Black</b>	5,389 (12.3)	3,078 (57.1)	2,311 (42.9)	
<b>Hispanic (All Races)</b>	8,972 (20.6)	4,915 (54.8)	4,057 (45.2)	
<b>Non-Hispanic API</b>	6,688 (15.3)	3,233 (48.3)	3,455 (51.7)	
<b>Non-Hispanic AIAN</b>	250 (0.6)	144 (57.6)	106 (42.4)	
<b>Socioeconomic Status, quintile, n (%)</b>				<0.0001
<b>1 (Lowest SES)</b>	7,304 (17.6)	4,102 (56.2)	3,202 (43.8)	
<b>2</b>	7,128 (17.2)	4,033 (56.6)	3,095 (43.4)	
<b>3</b>	7,494 (18.0)	4,302 (57.4)	3,192 (42.6)	
<b>4</b>	8,982 (21.6)	5,145 (57.3)	3,837 (42.7)	
<b>5 (Highest SES)</b>	10,639 (25.6)	5,685 (53.4)	4,954 (46.6)	
<b>Stage at Diagnosis, n (%)</b>				<0.0001
<b>Localized</b>	11,707 (26.8)	2,556 (21.8)	9,151 (78.2)	
<b>Regional</b>	16,203 (37.0)	8,987 (55.5)	7,216 (44.5)	
<b>Distant</b>	15,842 (36.2)	12,936 (81.7)	2,906 (18.3)	
<b>Treatment Type</b>				<0.0001
<b>No Treatment</b>	126 (0.3)	76 (60.3)	50 (39.7)	
<b>Chemotherapy Only</b>	9,945 (22.8)	8,060 (33.0)	1,885 (9.8)	
<b>Radiation Only</b>	1,298 (3.0)	1,097 (84.5)	201 (15.5)	
<b>Surgery Only</b>	13,293 (30.4)	4,471 (33.6)	8,822 (66.4)	
<b>2 Treatment Modalities</b>	11,444 (26.2)	6,994 (61.1)	4,450 (38.9)	
<b>3 Treatment Modalities</b>	7,610 (17.4)	3,751 (49.3)	3,859 (50.7)	
<b>Setting of Residence, n (%)</b>				<0.0001
<b>Urban</b>	38,609 (91.4)	2,182 (59.7)	1,475 (40.3)	
<b>Rural</b>	3,657 (8.7)	21,454 (55.6)	17,155 (44.4)	
<b>Persistent Poverty, n (%)</b>	4,443 (10.5)	2,453 (55.2)	1,990 (44.8)	0.312
<b>Marital Status, n (%)</b>				<0.0001
<b>Partnered</b>	26,333 (63.0)	14,638 (55.6)	11,695 (44.4)	
<b>Unpartnered</b>	15,470 (37.0)	8,887 (57.5)	6,583 (42.6)	
<b>Survival Months, median (IQR)</b>	15 (6-39)	10 (4-19)	36 (12-78)	<0.0001

**Table 1.** Demographic characteristics of patients with gastric carcinoma (GC)

Variable	Localized GC (n=11,707)			Distant Metastatic GC (n=15,842)		
	Adjusted Odds Ratio	95% CI	P Value	Adjusted Odds Ratio	95% CI	P Value
Age	0.98	0.97-0.98	<0.001	1.00	0.99-1.00	0.08
Female Sex	1.51	1.35-1.69	<0.001	0.94	0.85-1.03	0.19
Race/Ethnicity*						
NH Black	0.97	0.81-1.15	0.70	1.15	0.99-1.34	0.08
Hispanic	1.11	0.96-1.29	0.15	1.58	1.41-1.78	<0.001
NH Asian/PI	1.39	1.19-1.62	<0.001	1.50	1.31-1.71	<0.001
NH AIAN	1.87	0.74-4.69	0.18	1.22	0.58-2.56	0.60
SES Quintile^						
1	0.79	0.65-0.97	0.02	0.99	0.83-1.18	0.91
2	0.77	0.65-0.91	0.002	1.00	0.87-1.16	0.98
3	0.77	0.65-0.90	0.001	0.88	0.76-1.01	0.07
4	0.73	0.62-0.85	<0.001	0.94	0.82-1.07	0.32
Urban	1.25	1.05-1.49	0.01	1.03	0.87-1.22	0.72
Married/Partnered	1.18	1.06-1.32	0.002	0.89	0.81-0.98	0.02

**Table 2.** Multivariable logistic regression models of odds of survival by gastric carcinoma (GC) stage

NH = Non-Hispanic

PI = Pacific Islander

AIAN = American Indian and Alaska Native

SES = socioeconomic status

\*Odds ratios for race/ethnicity are compared against Non-Hispanic whites

^Odds ratios for SES quintile are compared against the highest SES quintile (5<sup>th</sup>)