Figure S1 Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in subgroups of primate sites. (A) Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in cardia subgroup; (B) Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in oxyntic mucosa subgroup; (C) Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in antral mucosa subgroup; (D) Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in stomach, NOS subgroup; (E) Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification in overlapping lesions subgroup. NOS, not otherwise specified.
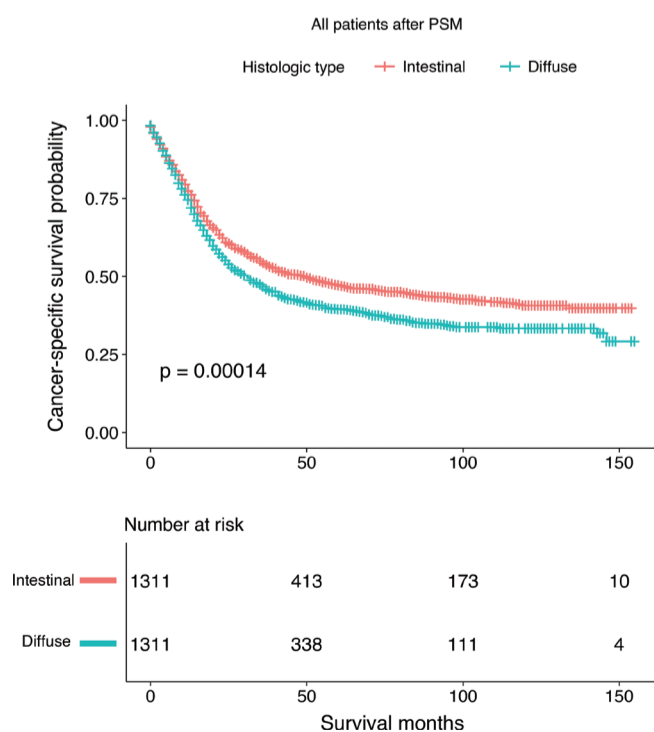

Figure S2 Kaplan-Meier analysis of cancer-specific survival based on Lauren's classification after propensity score matching.

Table S1 Baseline characteristics of the participants before and after propensity score matching

Variables	Before PSM				After PSM			
	All patients (N=20,218)	Intestinal (N=14,374)	Diffuse (N=5,844)	P value	All patients (N=2,622)	Intestinal (N=1,311)	Diffuse (N=1,311)	P value
Age (years)	65.6±13.4	67.5±12.6	60.9±14.0	<0.001	66.2±11.0	66.15±11.01	66.15±11.01	1.0000
Sex				<0.001				<0.0001
Male	12,746 (63.0%)	9,739 (67.8%)	3,007 (51.5%)		1,599 (61.0%)	861 (65.7%)	738 (56.3%)	
Female	7,472 (37.0%)	4,635 (32.2%)	2,837 (48.5%)		1,023 (39.0%)	450 (34.3%)	573 (43.7%)	
Year				0.606				0.0686
2004–2007	7,174 (35.5%)	5,073 (35.3%)	2,101 (36.0%)		945 (36.0%)	500 (38.1%)	445 (33.9%)	
2008–2011	6,635 (32.8%)	4,720 (32.8%)	1,915 (32.8%)		879 (33.5%)	419 (32%)	460 (35.1%)	
2011–2015	6,409 (31.7%)	4,581 (31.9%)	1,828 (31.3%)		798 (30.4%)	392 (29.9%)	406 (31%)	
Primary site				<0.001				1.0000
Cardia	5,657 (28.0%)	4,939 (34.4%)	718 (12.3%)		684 (26.1%)	342 (26.1%)	342 (26.1%)	
Fundus of stomach	576 (2.8%)	412 (2.9%)	164 (2.8%)		18 (0.7%)	9 (0.7%)	9 (0.7%)	
Lesser curvature of stomach	2,140 (10.6%)	1,404 (9.8%)	736 (12.6%)		300 (11.4%)	150 (11.4%)	150 (11.4%)	
Greater curvature of stomach	883 (4.4%)	589 (4.1%)	294 (5.0%)		54 (2.1%)	27 (2.1%)	27 (2.1%)	
Body of stomach	1,800 (8.9%)	1,135 (7.9%)	665 (11.4%)		198 (7.6%)	99 (7.6%)	99 (7.6%)	
Gastric antrum	5,075 (25.1%)	3,429 (23.9%)	1,646 (28.2%)		950 (36.2%)	475 (36.2%)	475 (36.2%)	
Pylorus	786 (3.9%)	551 (3.8%)	235 (4.0%)		46 (1.8%)	23 (1.8%)	23 (1.8%)	
Stomach, NOS	1,823 (9.0%)	1,134 (7.9%)	689 (11.8%)		174 (6.6%)	87 (6.6%)	87 (6.6%)	
Overlapping lesion of stomach	1,478 (7.3%)	781 (5.4%)	697 (11.9%)		198 (7.6%)	99 (7.6%)	99 (7.6%)	
Grade				<0.001				1.0000
Moderately differentiated or well differentiated	6,142 (30.4%)	5,989 (41.7%)	153 (2.6%)		76 (2.9%)	38 (2.9%)	38 (2.9%)	
Poorly differentiated or undifferentiated	12,711 (62.9%)	7,455 (51.9%)	5,256 (89.9%)		2,478 (94.5%)	1,239 (94.5%)	1,239 (94.5%)	
Unknown	1,365 (6.8%)	930 (6.5%)	435 (7.4%)		68 (2.6%)	34 (2.6%)	34 (2.6%)	
T stage				<0.001				1.0000
T1	4,824 (23.9%)	3,778 (26.3%)	1,046 (17.9%)		590 (22.5%)	295 (22.5%)	295 (22.5%)	
T2a	2,183 (10.8%)	1,687 (11.7%)	496 (8.5%)		140 (5.3%)	70 (5.3%)	70 (5.3%)	
T2b	6,417 (31.7%)	4,673 (32.5%)	1,744 (29.8%)		1,042 (39.7%)	521 (39.7%)	521 (39.7%)	
T2, NOS	134 (0.7%)	105 (0.7%)	29 (0.5%)		0 (0)	0 (0%)	0 (0%)	
T3	4,507 (22.3%)	2,764 (19.2%)	1,743 (29.8%)		700 (26.7%)	350 (26.7%)	350 (26.7%)	
T4	1,750 (8.7%)	1,059 (7.4%)	691 (11.8%)		140 (5.3%)	70 (5.3%)	70 (5.3%)	
TX	403 (2.0%)	308 (2.1%)	95 (1.6%)		10 (0.4%)	5 (0.4%)	5 (0.4%)	
N stage				<0.001				1.0000
N0	8,155 (40.3%)	6,274 (43.6%)	1,881 (32.2%)		872 (33.3%)	436 (33.3%)	436 (33.3%)	
N1	7,332 (36.3%)	5,401 (37.6%)	1,931 (33.0%)		1,096 (41.8%)	548 (41.8%)	548 (41.8%)	
N2	3,124 (15.5%)	1,853 (12.9%)	1,271 (21.7%)		516 (19.7%)	258 (19.7%)	258 (19.7%)	
N3	1,253 (6.2%)	594 (4.1%)	659 (11.3%)		130 (5.0%)	65 (5%)	65 (5%)	
NX	354 (1.8%)	252 (1.8%)	102 (1.7%)		8 (0.3%)	4 (0.3%)	4 (0.3%)	
M stage				<0.001				1.0000
M0	17,483 (86.5%)	12,652 (88.0%)	4,831 (82.7%)		2,490 (95.0%)	1,245 (95%)	1,245 (95%)	
M1	2,378 (11.8%)	1,457 (10.1%)	921 (15.8%)		126 (4.8%)	63 (4.8%)	63 (4.8%)	
MX	357 (1.8%)	265 (1.8%)	92 (1.6%)		6 (0.2%)	3 (0.2%)	3 (0.2%)	
Operation				<0.001				0.0723
Surgery	19,272 (95.3%)	13,534 (94.2%)	5,738 (98.2%)		2,584 (98.6%)	1,286 (98.1%)	1,298 (99%)	
Endoscopy	946 (4.7%)	840 (5.8%)	106 (1.8%)		38 (1.4%)	25 (1.9%)	13 (1%)	
Radiation				<0.001				0.0347
None/unknown	13,531 (66.9%)	9,728 (67.7%)	3,803 (65.1%)		1,638 (62.5%)	830 (63.3%)	808 (61.6%)	
Yes	6,687 (33.1%)	4,646 (32.3%)	2,041 (34.9%)		984 (37.5%)	481 (36.7%)	503 (38.4%)	
Chemotherapy				<0.001				0.3678
No/unknown	9,931 (49.1%)	7,508 (52.2%)	2,423 (41.5%)		1,220 (46.5%)	622 (47.4%)	598 (45.6%)	
Yes	10,287 (50.9%)	6,866 (47.8%)	3,421 (58.5%)		1,402 (53.5%)	689 (52.6%)	713 (54.4%)	
Tumor size (cm)				<0.001				1.0000
T ≤2	3,553 (17.6%)	2,683 (18.7%)	870 (14.9%)		434 (16.6%)	217 (16.6%)	217 (16.6%)	
2< T ≤3	2,551 (12.6%)	1,860 (12.9%)	691 (11.8%)		256 (9.8%)	128 (9.8%)	128 (9.8%)	
3< T ≤5	4,724 (23.4%)	3,584 (24.9%)	1,140 (19.5%)		594 (22.7%)	297 (22.7%)	297 (22.7%)	
T >5	6,512 (32.2%)	4,229 (29.4%)	2,283 (39.1%)		1,118 (42.6%)	559 (42.6%)	559 (42.6%)	
Unknown	2,878 (14.2%)	2,018 (14.0%)	860 (14.7%)		220 (8.4%)	110 (8.4%)	110 (8.4%)	
Race				<0.001				0.1424
White	13,649 (67.5%)	9,790 (68.1%)	3,859 (66.0%)		1,723 (65.7%)	843 (64.3%)	880 (67.1%)	
Asian or Pacific Islander	3,714 (18.4%)	2,538 (17.7%)	1,176 (20.1%)		565 (21.5%)	279 (21.3%)	286 (21.8%)	
Black	2,615 (12.9%)	1,894 (13.2%)	721 (12.3%)		309 (11.8%)	175 (13.3%)	134 (10.2%)	
American Indian/Alaska Native	177 (0.9%)	114 (0.8%)	63 (1.1%)		17 (0.6%)	9 (0.7%)	8 (0.6%)	
Unknown	63 (0.3%)	38 (0.3%)	25 (0.4%)		8 (0.3%)	5 (0.4%)	3 (0.2%)	
Insurance				<0.001				0.0531
Insured	11,626 (57.5%)	8,378 (58.3%)	3,248 (55.6%)		1,512 (57.7%)	730 (55.7%)	782 (59.6%)	
Medicaid	2,425 (12.0%)	1,697 (11.8%)	728 (12.5%)		308 (11.7%)	155 (11.8%)	153 (11.7%)	
Uninsured	459 (2.3%)	295 (2.1%)	164 (2.8%)		53 (2.0%)	34 (2.6%)	19 (1.4%)	
Unknown	5,708 (28.2%)	4,004 (27.9%)	1,704 (29.2%)		749 (28.6%)	392 (29.9%)	357 (27.2%)	
Marital status				<0.001				0.9833
Married	12,309 (60.9%)	8,736 (60.8%)	3,573 (61.1%)		1,654 (63.1%)	829 (63.2%)	825 (62.9%)	
Divorced or separated	1,826 (9.0%)	1,275 (8.9%)	551 (9.4%)		229 (8.7%)	110 (8.4%)	119 (9.1%)	
Widowed	2,659 (13.2%)	2,036 (14.2%)	623 (10.7%)		343 (13.1%)	170 (13%)	173 (13.2%)	
Single (never married)	2,619 (13.0%)	1,752 (12.2%)	867 (14.8%)		303 (11.6%)	153 (11.7%)	150 (11.4%)	
Unmarried or domestic partner	18 (0.1%)	14 (0.1%)	4 (0.1%)		2 (0.1%)	1 (0.1%)	1 (0.1%)	
Unknown	787 (3.9%)	561 (3.9%)	226 (3.9%)		91 (3.5%)	48 (3.7%)	43 (3.3%)	
Survival months, median (interquartile range)	25.0 (11.0–58.0)	27.0 (12.0–62.0)	20.0 (9.0–48.0)	<0.001	24.0 (11.0–57.0)	26.0 (11.0–65.0)	22.0 (10.0–51.0)	0.002

PSM, propensity score matching; NOS, not otherwise specified.

Table S2 Univariable Cox regression analysis for cancer-specific survival in patients with gastric adenocarcinoma

Variable	β/HR (95% CI)	P value
Age	1.01 (1.01, 1.02)	<0.0001
Sex		
Male	Reference	
Female	1.05 (0.94, 1.17)	0.3632
Year		
2004–2007	Reference	
2008–2011	0.91 (0.81, 1.03)	0.1258
2011–2015	0.76 (0.66, 0.88)	0.0002
Primary site		
Cardia	Reference	
Fundus of stomach	0.84 (0.45, 1.56)	0.5742
Lesser curvature of stomach	0.74 (0.61, 0.89)	0.0020
Greater curvature of stomach	0.54 (0.35, 0.84)	0.0058
Body of stomach	0.85 (0.68, 1.06)	0.1506
Gastric antrum	0.80 (0.70, 0.92)	0.0015
Pylorus	1.20 (0.83, 1.73)	0.3284
Stomach, NOS	1.13 (0.91, 1.41)	0.2618
Overlapping lesion of stomach	1.42 (1.16, 1.73)	0.0005
Grade		
Moderately differentiated or well differentiated	Reference	
Poorly differentiated or undifferentiated	2.23 (1.48, 3.37)	0.0001
Unknown	0.92 (0.50, 1.68)	0.7780
Histologic type		
Intestinal	Reference	
Diffuse	1.23 (1.10, 1.36)	0.0002
T stage		
T1	Reference	
T2a	2.07 (1.46, 2.93)	<0.0001
T2b	4.77 (3.88, 5.86)	<0.0001
T3	6.49 (5.25, 8.01)	<0.0001
T4	9.44 (7.27, 12.26)	<0.0001
TX	2.98 (1.10, 8.09)	0.0320
N stage		
N0	Reference	
N1	3.37 (2.89, 3.93)	<0.0001
N2	5.32 (4.49, 6.30)	<0.0001
N3	7.89 (6.25, 9.95)	<0.0001
NX	6.04 (2.68, 13.59)	<0.0001
M stage		
M0	Reference	
M1	2.79 (2.28, 3.42)	<0.0001
MX	1.60 (0.60, 4.28)	0.3454
Operation		
Surgery	Reference	
Endoscopy	0.47 (0.25, 0.88)	0.0180
Radiation		
None/unknown	Reference	
Yes	1.08 (0.97, 1.20)	0.1755
Chemotherapy		
No/unknown	Reference	
Yes	1.25 (1.13, 1.40)	<0.0001
Tumor size (cm)		
T ≤2	Reference	
2< T ≤3	2.37 (1.78, 3.17)	<0.0001
3< T ≤5	3.79 (2.98, 4.83)	<0.0001
T >5	5.92 (4.72, 7.43)	<0.0001
Unknown	2.79 (2.08, 3.75)	<0.0001
Race		
White	Reference	
Asian or Pacific Islander	0.73 (0.63, 0.84)	<0.0001
Black	1.00 (0.85, 1.18)	0.9817
American Indian/Alaska Native	2.14 (1.26, 3.63)	0.0047
Unknown	0.19 (0.03, 1.34)	0.0959
Insurance		
Insured	Reference	
Medicaid	1.25 (1.05, 1.48)	0.0110
Uninsured	1.05 (0.70, 1.58)	0.7990
Unknown	1.28 (1.14, 1.44)	<0.0001
Marital status		
Married	Reference	
Divorced or separated	1.33 (1.11, 1.60)	0.0021
Widowed	1.46 (1.26, 1.70)	<0.0001
Single (never married)	1.04 (0.87, 1.23)	0.6912
Unmarried or domestic partner	6.71 (1.67, 26.93)	0.0073
Unknown	0.77 (0.54, 1.08)	0.1274

PSM, propensity score matching; NOS, not otherwise specified; HR, hazard ratio; CI, confidence interval.

Table S3 Multivariable Cox regression models evaluating the association between Lauren's classification and cancer-specific survival

Lauren's classification	Crude		Model I		Model II	
	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
Intestinal	Reference		Reference		Reference	
Diffuse	1.23 (1.10, 1.36)	0.0002	1.22 (1.10, 1.36)	0.0002	1.22 (1.10, 1.36)	0.0002

Adjustment I: sex. Adjustment II: sex; radiation. HR, hazard ratio; CI, confidence interval.

Table S4 Results of competing risks regression model with all the risk factors in patients with gastric adenocarcinoma

Variables	HR (95% CI)	P value
Age	1.01 (1.01, 1.01)	<0.0001
Sex		
Male	Reference	
Female	0.97 (0.91, 1.03)	0.3042
Year of diagnosis		
2004–2007	Reference	
2008–2011	0.84 (0.76, 0.92)	0.0003
2011–2015	0.44 (0.39, 0.49)	<0.0001
Primary site		
Cardia	Reference	
Fundus of stomach	0.77 (0.65, 0.91)	0.0018
Lesser curvature of stomach	0.64 (0.58, 0.70)	<0.0001
Greater curvature of stomach	0.71 (0.61, 0.82)	<0.0001
Body of stomach	0.72 (0.65, 0.80)	<0.0001
Gastric antrum	0.71 (0.66, 0.77)	<0.0001
Pylorus	0.82 (0.71, 0.95)	0.0065
Stomach, NOS	0.82 (0.73, 0.91)	0.0003
Overlapping lesion of stomach	0.79 (0.70, 0.89)	<0.0001
Grade		
Moderately differentiated or well differentiated	Reference	
Poorly differentiated or Undifferentiated	1.23 (1.15, 1.31)	<0.0001
Unknown	0.93 (0.83, 1.05)	0.2568
Histologic type		
Intestinal	Reference	
Diffuse	1.32 (1.23, 1.41)	<0.0001
T stage		
T1	Reference	
T2a	1.60 (1.42, 1.80)	<0.0001
T2b	2.47 (2.23, 2.74)	<0.0001
T2, NOS	1.76 (1.25, 2.47)	0.0011
T3	3.21 (2.89, 3.58)	<0.0001
T4	4.38 (3.82, 5.02)	<0.0001
TX	2.74 (2.21, 3.39)	<0.0001
N stage		
N0	Reference	
N1	1.67 (1.57, 1.79)	<0.0001
N2	2.42 (2.22, 2.63)	<0.0001
N3	3.34 (2.91, 3.83)	<0.0001
NX	1.33 (1.05, 1.67)	0.0161
M stage		
M0	Reference	
M1	2.98 (2.66, 3.34)	<0.0001
MX	1.31 (1.04, 1.64)	0.0209
Operation		
Surgery	Reference	
Endoscopy	1.29 (1.12, 1.50)	0.0005
Radiation		
None/unknown	Reference	
Yes	0.91 (0.85, 0.98)	0.0146
Chemotherapy		
No/unknown	Reference	
Yes	1.00 (0.92, 1.08)	0.9243
Tumor size (cm)		
T ≤2	Reference	
2< T ≤3	1.25 (1.12, 1.39)	<0.0001
3< T ≤5	1.25 (1.13, 1.38)	<0.0001
T >5	1.28 (1.16, 1.40)	<0.0001
Unknown	1.41 (1.27, 1.57)	<0.0001
Race		
White	Reference	
Asian or Pacific Islander	0.79 (0.74, 0.85)	<0.0001
Black	1.00 (0.91, 1.08)	0.9193
American Indian/Alaska Native	1.51 (1.09, 2.09)	0.0122
Unknown	0.14 (0.06, 0.34)	<0.0001
Insurance		
Insured	Reference	
Medicaid	0.99 (0.91, 1.08)	0.8124
Uninsured	0.93 (0.78, 1.11)	0.4342
Unknown	1.01 (0.91, 1.11)	0.8773
Marital status		
Married	Reference	
Divorced or separated	1.08 (0.99, 1.19)	0.0979
Widowed	1.05 (0.96, 1.14)	0.3263
Single (never married)	1.05 (0.96, 1.14)	0.2666
Unmarried or domestic partner	0.69 (0.21, 2.28)	0.5484
Unknown	0.96 (0.83, 1.11)	0.5745

NOS, not otherwise specified; HR, hazard ratio; CI, confidence interval.

Table S5 Univariable Cox regression analysis for cancer-specific survival in patients with gastric cancer

Variables	HR (95% CI)	P value
Primary site		
Cardia	Reference	
Oxyntic mucosa	0.99 (0.94, 1.05)	0.7774
Antral mucosa	1.05 (1.00, 1.11)	0.0493
Stomach, NOS	1.42 (1.32, 1.53)	<0.0001
Overlapping lesions	1.72 (1.59, 1.85)	<0.0001

NOS, not otherwise specified; HR, hazard ratio; CI, confidence interval.

Table S6 Multivariable Cox regression models evaluating the association between Lauren's classification and cancer-specific survival

Lauren's classification	Crude		Model III		Model IV	
	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
Intestinal	Reference		Reference		Reference	
Diffuse	1.44 (1.38, 1.50)	<0.001	1.19 (1.13, 1.24)	<0.001	1.20 (1.15, 1.26)	<0.001

Adjustment III: age; primary site (5 sites); grade; T stage; N stage; M stage; tumor size. Adjustment IV: age; sex; year; primary site (5 sites); grade; T stage; N stage; M stage; operation; chemotherapy; tumor size; race; insurance; marital status. NOS, not otherwise specified; HR, hazard ratio; CI, confidence interval.