

**Table S1. Univariate Logistic Regression for the Presence of Liver Metastases at Diagnosis of Gastric Cancer.**

Variable	Patients, No.		Among Entire Cohort		Among Subset With Metastatic Disease	
	Patients (n=20761)	With Liver Metastases (n =3507)	OR (95% CI)	P Value	OR (95% CI)	P Value
<b>Year at diagnosis</b>						
2014	4333	695	1 (Reference)	NA	1 (Reference)	NA
2010	4005	696	1.101 (0.981-1.235)	0.102	1.134 (0.983-1.308)	0.084
2011	3982	700	1.116 (0.995-1.253)	0.061	0.916 (0.796-1.054)	0.221
2012	4280	671	0.993 (0.885-1.115)	0.906	1.059 (0.922-1.218)	0.416
2013	4233	745	1.118 (0.998-1.252)	0.054	0.882 (0.768-1.014)	0.078
<b>Age at diagnosis, Y</b>						
18-40	929	118	1 (Reference)	NA	1 (Reference)	NA
41-65	8818	1588	1.510 (1.235-1.845)	<0.001	2.383 (1.923-2.954)	<0.001
66-80	7399	1296	1.459 (1.192-1.787)	<0.001	3.527 (2.833-4.392)	<0.001
80+	3615	505	1.116 (0.900-1.383)	0.317	3.552 (2.794-4.514)	<0.001
<b>Race</b>						
Others <sup>a</sup>	3419	432	1 (Reference)	NA	1 (Reference)	NA
White	14490	2521	1.456 (1.305-1.625)	<0.001	1.327 (1.165-1.511)	<0.001
Black	2696	534	1.708 (1.487-1.961)	<0.001	1.688 (1.425-1.999)	<0.001
Unknown	156	20	1.017 (0.629-1.643)	0.946	1.590 (0.852-2.966)	0.145
<b>Sex</b>						
Female	7668	1014	1 (Reference)	NA	1 (Reference)	NA
Male	13093	2493	1.543 (1.426-1.671)	<0.001	1.688 (1.536-1.855)	<0.001
<b>Original</b>						
Hispanic	4234	598	1 (Reference)	NA	1 (Reference)	NA
Non-Hispanic	16527	2909	1.299 (1.181-1.429)	<0.001	1.785 (1.598-1.993)	<0.001
<b>Tumor location</b>						
Upper	7617	1628	1 (Reference)	NA	1 (Reference)	NA
Middle	1978	274	0.592 (0.515-0.680)	<0.001	0.446 (0.378-0.526)	<0.001
Lower	4397	534	0.509 (0.457-0.565)	<0.001	0.531 (0.466-0.607)	<0.001
Overlapping lesion	1585	234	0.637 (0.549-0.740)	<0.001	0.365 (0.307-0.433)	<0.001
Unknown	5184	837	0.708 (0.646-0.777)	<0.001	0.460 (0.411-0.515)	<0.001
<b>Pathology grade</b>						
I	949	68	1 (Reference)	NA	1 (Reference)	NA
II	4537	897	3.193 (2.468-4.129)	<0.001	1.502 (1.043-2.165)	0.029
III	11177	1705	2.332 (1.813-3.001)	<0.001	0.540 (0.379-0.769)	0.001
IV	317	36	1.660 (1.084-2.541)	0.020	0.488 (0.285-0.835)	0.009
Unknown	3781	801	3.482 (2.689-4.511)	<0.001	0.656 (0.458-0.941)	0.022
<b>Lauren classification</b>						

Diffuse-type	5957	444	1 (Reference)	NA	1 (Reference)	NA
Intestinal-type	14264	2973	3.269 (2.944-3.631)	<0.001	5.392 (4.800-6.057)	<0.001
Others <sup>b</sup>	540	90	2.483 (1.942-3.176)	<0.001	4.181 (3.076-5.683)	<0.001
<b>T staging<sup>c</sup></b>						
T1	4977	728	1 (Reference)	NA	1 (Reference)	NA
Tis	129	16	0.826 (0.487-1.403)	0.480	0.607 (0.322-1.148)	0.125
T2	1785	97	0.335 (0.269-0.418)	<0.001	0.350 (0.271-0.452)	<0.001
T3	5038	400	0.503 (0.442-0.573)	<0.001	0.538 (0.458-0.632)	<0.001
T4	3883	641	1.154 (1.028-1.295)	0.015	0.549 (0.476-0.633)	<0.001
Unknown	4949	1625	2.853 (2.586-3.149)	<0.001	0.936 (0.827-1.061)	0.302
<b>N staging<sup>c</sup></b>						
N0	9355	1183	1 (Reference)	NA	1 (Reference)	NA
N1	5541	1314	2.147 (1.969-2.342)	<0.001	1.262 (1.135-1.403)	<0.001
N2	1852	172	0.707 (0.598-0.837)	<0.001	0.888 (0.723-1.090)	0.256
N3	1953	149	0.571 (0.478-0.682)	<0.001	0.583 (0.475-0.716)	0.000
Unknown	2060	689	3.472 (3.110-3.875)	<0.001	1.254 (1.104-1.425)	0.001
<b>Tumor size, cm</b>						
0-1	955	51	1 (Reference)	NA	1 (Reference)	NA
1-2	1502	100	1.319 (0.928-1.875)	0.123	1.179 (0.767-1.814)	0.453
2-5	5167	666	2.741 (2.033-3.695)	<0.001	1.595 (1.110-2.292)	0.012
5+	4041	617	3.338 (2.473-4.506)	<0.001	1.501 (1.044-2.158)	0.028
Unknown	9096	2073	5.458 (4.077-7.306)	<0.001	1.242 (0.874-1.764)	0.227
<b>Extrahepatic metastatic sites to bone, lung, and brain, No.</b>						
0	18406	2432	1 (Reference)	NA	1 (Reference)	NA
1	1657	669	4.448 (3.996-4.950)	<0.001	0.890 (0.796-0.995)	0.040
2	265	136	6.925 (5.422-8.844)	<0.001	1.385 (1.083-1.773)	0.010
3	17	11	12.042 (4.449-32.590)	<0.001	2.409 (0.890-6.524)	0.084
Unknown	416	259	10.836 (8.847-13.271)	<0.001	2.790 (2.235-3.482)	<0.001
<b>Marital status</b>						
Married	11782	2032	1 (Reference)	NA	1 (Reference)	NA
Single	3257	584	1.048 (0.947-1.160)	0.362	0.897 (0.795-1.012)	0.078
Divorced	1737	308	1.034 (0.906-1.180)	0.618	0.971 (0.828-1.139)	0.716
Widowed	2888	432	0.844 (0.754-0.945)	0.003	1.174 (1.017-1.355)	0.028
Unknown	1097	151	0.766 (0.641-0.915)	0.003	0.981 (0.787-1.223)	0.867
<b>Residence type</b>						
Rural	1546	290	1 (Reference)	NA	1 (Reference)	NA
Urban	346	48	0.698 (0.501-0.971)	0.033	1.216 (0.809-1.965)	0.305
Metropolitan	18869	3169	0.874 (0.765-0.999)	0.048	0.857 (0.726-1.012)	0.068
<b>Insurance situation</b>						
Yes	19271	3229	1 (Reference)	NA	1 (Reference)	NA

No	960	197	1.283 (1.092-1.507)	0.020	0.814 (0.677-0.980)	0.029
Unknown	530	81	0.896 (0.705-1.139)	0.372	1.547 (1.114-2.148)	0.009
Bachelor education (per 10% increase)	20761	3057	0.959 (0.926-0.993)	0.018	0.956 (0.916-0.997)	0.035
Median household income (per \$20,000 increase)	20761	3057	0.968 (0.930-1.008)	0.116	0.967 (0.921-1.016)	0.181
Current smoking status (per 10% increase)	20761	3057	1.155 (1.085-1.230)	<0.001	1.189 (1.101-1.286)	<0.001
Ever smoking status (per 10% increase)	20761	3057	1.090 (1.036-1.146)	0.001	1.148 (1.079-1.220)	<0.001

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Abbreviations:

CI: confidence interval, GCLM: gastric cancer with liver metastases;

<sup>a</sup> including Asian and American Indians;

<sup>b</sup> including linitis plastica, hepatoid adenocarcinoma, adenosquamous carcinoma;

<sup>c</sup> according to the seventh edition of the AJCC Cancer Staging manual.

**Table S2. Univariate Analysis for All-Cause Mortality Among Patients With Liver Metastases.**

Variable	Patients, No.		All-Cause Mortality	
	Patients (n = 20761)	With Liver Metastases (n = 3507)	Hazard Ratio (95% CI)	P Value
<b>Year at diagnosis</b>				
2014	4333	695	1 (Reference)	NA
2010	4005	696	1.262 (1.106-1.439)	0.001
2011	3982	700	1.151 (1.009-1.313)	0.036
2012	4280	671	1.216 (1.065-1.388)	0.004
2013	4233	745	1.134 (0.994-1.294)	0.062
<b>Age at diagnosis, Y</b>				
80+	3615	505	1 (Reference)	NA
18-40	929	118	0.543 (0.435-0.678)	<0.001
41-65	8818	1588	0.528 (0.475-0.588)	<0.001
66-80	7399	1296	0.635 (0.569-0.708)	<0.001
<b>Race</b>				
Others <sup>a</sup>	3419	432	1 (Reference)	NA
White	14490	2521	0.995 (0.891-1.112)	0.929
Black	2696	534	1.037 (0.903-1.190)	0.608
Unknown	156	20	0.620 (0.331-1.162)	0.136
<b>Sex</b>				
Male	13093	2493	1 (Reference)	NA
Female	7668	1014	1.065 (0.983-1.153)	0.121
<b>Original</b>				
Hispanic	4234	598	1 (Reference)	NA
Non-Hispanic	16527	2909	0.965 (0.875-1.065)	0.483
<b>Tumor location</b>				
Upper	7617	1628	1 (Reference)	NA
Middle	1978	274	1.134 (0.986-1.304)	0.078
Lower	4397	534	1.052 (0.944-1.172)	0.361
Overlapping lesion	1585	234	1.429 (1.234-1.653)	<0.001
Unknown	5184	837	1.261 (1.152-1.380)	<0.001
<b>Pathology grade</b>				
I	949	68	1 (Reference)	NA
II	4537	897	0.952 (0.720-1.258)	0.727
III	11177	1705	1.197 (0.910-1.574)	0.200
IV	317	36	1.263 (0.811-1.968)	0.301
Unknown	3781	801	1.290 (0.976-1.707)	0.074
<b>Lauren classification</b>				
Intestinal-type	14264	2973	1 (Reference)	NA

Diffuse-type	5957	444	1.016 (1.382-2.142)	0.024
Others <sup>b</sup>	540	90	1.721 (1.382-2.142)	<0.001
<b>T staging<sup>c</sup></b>				
T1	4977	728	1 (Reference)	NA
Tis	129	16	1.697 (0.958-3.005)	0.070
T2	1785	97	0.727 (0.573-0.923)	0.009
T3	5038	400	0.702 (0.611-0.806)	<0.001
T4	3883	641	0.987 (0.880-1.107)	0.817
Unknown	4949	1625	1.075 (0.978-1.182)	0.135
<b>N staging<sup>c</sup></b>				
N0	9355	1183	1 (Reference)	NA
N1	5541	1314	0.853 (0.782-0.929)	<0.001
N2	1852	172	0.678 (0.566-0.812)	<0.001
N3	1953	149	0.707 (0.583-0.857)	<0.001
Unknown	2060	689	1.207 (1.091-1.334)	<0.001
<b>Surgery</b>				
Gastrectomy	7981	223	1 (Reference)	NA
RGCWROO <sup>d</sup>	952	29	0.536 (0.316-0.909)	0.021
No	11273	3234	1.615 (1.382-1.888)	<0.001
Refuse	555	21	2.788 (1.733-4.485)	<0.001
<b>Radiotherapy</b>				
Yes	5484	542	1 (Reference)	NA
No	15277	2965	1.164 (1.052-1.287)	0.003
<b>Chemotherapy</b>				
Yes	10782	1869	1 (Reference)	NA
No	9979	1638	3.061 (2.837-3.302)	<0.001
<b>Sequence of radiotherapy and surgery<sup>e</sup></b>				
Others	17637	3447	1 (Reference)	NA
RBS	1127	14	0.411 (0.213-0.790)	0.008
RAS	1952	45	0.662 (0.472-0.929)	0.017
RBAS	45	1	0.001 (0.000-NA)	0.868
<b>Tumor size, cm</b>				
0-1	955	51	1 (Reference)	NA
1-2	1502	100	0.585 (0.400-0.855)	0.006
2-5	5167	666	0.635 (0.464-0.869)	0.005
5+	4041	617	0.665 (0.485-0.911)	0.011
Unknown	9096	2073	0.779 (0.573-1.058)	0.109
<b>Extrahepatic metastatic sites to bone, lung, and brain, No.</b>				
0	18406	2432	1 (Reference)	NA
1	1657	669	1.337 (1.220-1.466)	<0.001

2	265	136	1.338 (1.104-1.621)	0.003
3	17	11	1.165 (0.625-2.169)	0.631
Unknown	416	259	1.428 (1.248-1.633)	<0.001
<b>Marital status</b>				
Married	11782	2032	1 (Reference)	NA
Single	3257	584	1.224 (1.108-1.352)	<0.001
Divorced	1737	308	1.196 (1.051-1.361)	0.007
Widowed	2888	432	1.408 (1.259-1.574)	<0.001
Unknown	1097	151	0.927 (0.769-1.116)	0.424
<b>Residence type</b>				
Rural	1546	290	1 (Reference)	NA
Urban	346	48	0.953 (0.690-1.317)	0.772
Metropolitan	18869	3169	0.768 (0.676-0.873)	<0.001
<b>Insurance situation</b>				
Yes	19271	3229	1 (Reference)	NA
No	960	197	1.141 (0.972-1.340)	0.107
Unknown	530	81	0.962 (0.759-1.220)	0.752
<b>Bachelor education (per 10% increase )</b>				
	20761	3507	0.946 (0.914-0.979)	0.001
<b>Median household income (per \$20,000 increase )</b>				
	20761	3507	0.930 (0.894-0.967)	<0.001
<b>Current smoking status (per 10% increase )</b>				
	20761	3507	1.075 (1.010-1.144)	0.022
<b>Ever smoking status (per 10% increase )</b>				
	20761	3057	1.013 (0.963-1.066)	0.615
<b>Treatment<sup>f</sup></b>				
RSC	2781	30	1 (Reference)	NA
RS	130	5	1.711 (0.584-5.013)	0.327
SC	1969	96	0.885 (0.534-1.466)	0.635
RC	1975	359	1.635 (1.039-2.573)	0.034
R	598	148	4.011 (2.508-6.414)	<0.001
S	4001	121	1.869 (1.156-3.023)	0.011
C	4065	1384	1.448 (0.930-2.254)	0.101
Others	5242	1364	5.140 (3.300-8.005)	<0.001
<b>Treatment<sup>f</sup></b>				
Others	5242	1364	1 (Reference)	NA
RSC	2781	30	0.195 (0.125-0.303)	<0.001
RS	130	5	0.333 (0.124-0.891)	0.028
SC	1969	96	0.172 (0.133-0.223)	<0.001
RC	1975	359	0.318 (0.279-0.363)	<0.001

R	598	148	0.780 (0.656-0.929)	0.005
S	4001	121	0.364 (0.296-0.447)	<0.001
C	4065	1384	0.282 (0.258-0.307)	<0.001
<b>Treatment<sup>f</sup></b>				
C	4065	1384	1 (Reference)	NA
RSC	2781	30	0.691 (0.444-1.075)	0.101
RS	130	5	1.182 (0.442-3.161)	0.739
SC	1969	96	0.611 (0.472-0.791)	<0.001
RC	1975	359	1.129 (0.990-1.287)	0.070
R	598	148	2.770 (2.319-3.309)	<0.001
S	4001	121	1.291 (1.050-1.587)	0.015
Others	5242	1364	3.550 (3.257-3.869)	<0.001

Abbreviations:

CI: confidence interval;

<sup>a</sup> including Asian and American Indians;

<sup>b</sup> including linitis plastica, hepatoid adenocarcinoma, adenosquamous carcinoma;

<sup>c</sup> according to the seventh edition of the AJCC Cancer Staging manual;

<sup>d</sup> RGCWROO: radical gastrectomy in continuity with the resection of other organs;

<sup>e</sup> including RBS: radiotherapy before surgery, RAS: radiotherapy after surgery, RBAS: radiotherapy before and after surgery, others: without radiotherapy or surgery or unknown sequence;

<sup>f</sup> including RSC: radiotherapy, surgery and chemotherapy, RS: radiotherapy and surgery, SC: chemotherapy and surgery, RC: radiotherapy and chemotherapy, R: only radiotherapy, S: only surgery, C: only chemotherapy, others: other treatment except for radiotherapy, surgery and chemotherapy.

**Table S3. Multivariable Cox Regression of Model 2 for All-Cause Mortality Among Patients With Liver Metastases.**

Variable	Patients, No.		All-Cause Mortality (Model 2)	
	All Patients (n = 20761)	With Liver Metastases (n = 3507)	Hazard Ratio (95% CI)	P Value
Treatment based on Others <sup>a,b</sup>				
Others	5242	1364	1 (Reference)	NA
RSC	2781	30	0.217 (0.138-0.340)	<0.001
RS	130	5	0.419 (0.155-1.136)	0.087
SC	1969	96	0.192 (0.147-0.256)	<0.001
RC	1975	359	0.339 (0.294-0.390)	<0.001
R	598	148	0.753 (0.631-0.899)	0.002
S	4001	121	0.419 (0.332-0.528)	<0.001
C	4065	1384	0.299 (0.272-0.327)	<0.001
Treatment based on RSC <sup>a,b</sup>				
RSC	2781	30	1 (Reference)	NA
RS	130	5	1.931 (0.651-5.725)	0.236
SC	1969	96	0.893 (0.536-1.489)	0.665
RC	1975	359	1.560 (1.003-2.469)	0.046
R	598	148	3.469 (2.155-5.584)	<0.001
S	4001	121	1.929 (1.184-3.145)	0.008
C	4065	1384	1.375 (0.879-2.153)	0.163
Others	5242	1364	4.607 (2.938-7.224)	<0.001
Treatment based on C <sup>a,b</sup>				
C	4065	1384	1 (Reference)	NA
RSC	2781	30	0.727 (0.465-1.138)	0.163
RS	130	5	1.404 (0.518-3.806)	0.505
SC	1969	96	0.650 (0.492-0.857)	0.002
RC	1975	359	1.135 (0.992-1.298)	0.066
R	598	148	2.522 (2.104-3.024)	<0.001
S	4001	121	1.403 (1.111-1.771)	0.004
Others	5242	1364	3.350 (3.056-3.672)	<0.001

Abbreviations:

CI: confidence interval, GCLM: gastric cancer with liver metastases;

<sup>a</sup> we put Treatment based on Others, Treatment based on RSC and Treatment based on C in the model 2 separately;<sup>b</sup> including RSC: radiotherapy, surgery and chemotherapy, RS: radiotherapy and surgery, SC: chemotherapy and surgery, RC: radiotherapy and chemotherapy, R: only radiotherapy, S: only surgery, C: only chemotherapy, others: other treatment except for radiotherapy, surgery and chemotherapy.



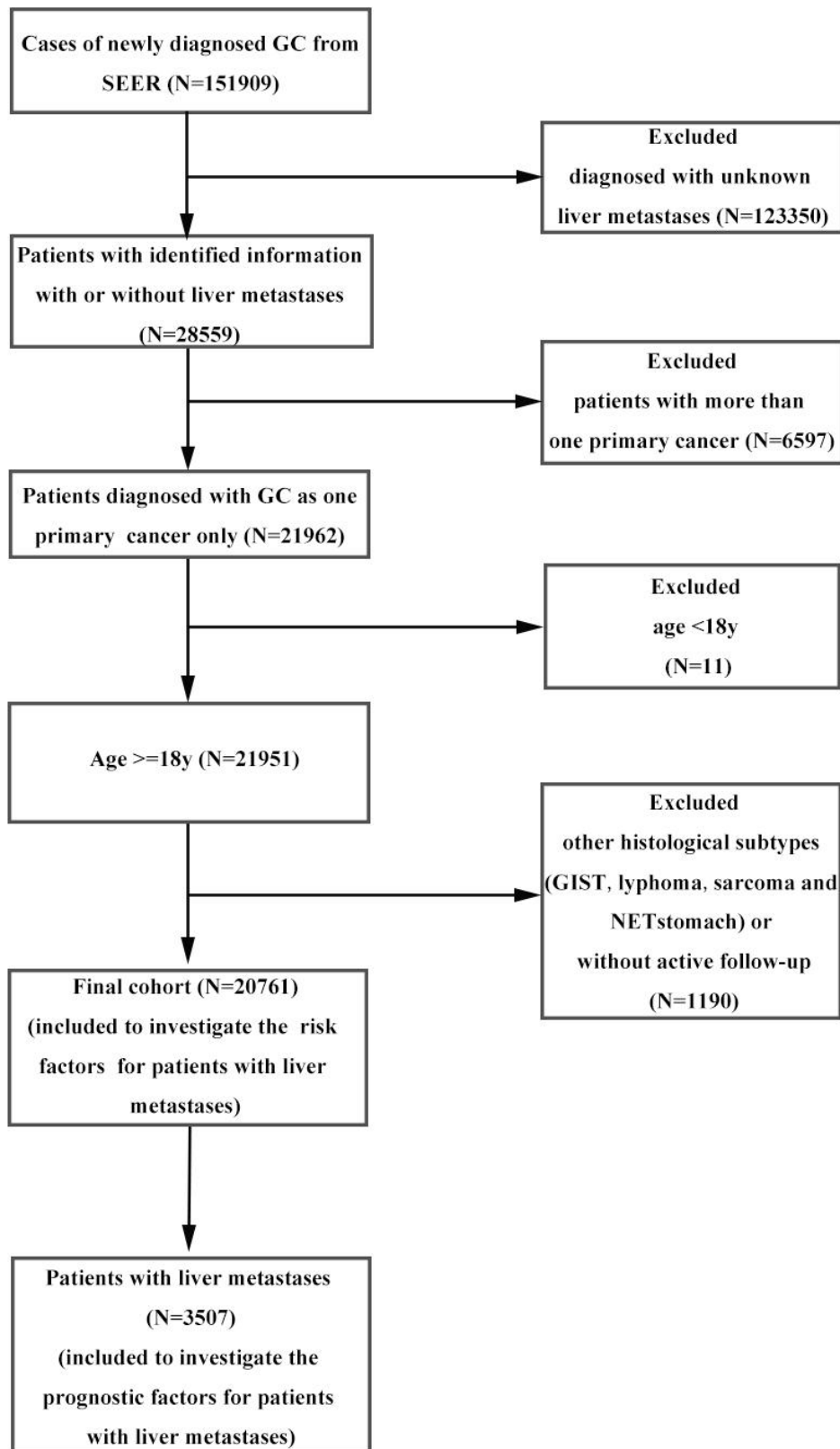
**Table S4. The Accumulate Survival Rates of Gastric Cancer With Identified Liver Metastases in Different Treatments.**

Treatment <sup>a</sup>	Patients, No.			Survival Rates %			
	With Gastric Cancer (n=20761)	With Metastatic Disease (n=7948)	With Liver Metastases (n=3507)	6 month-	1 year-	2 year-	3 year-
RSC	2781	130	30	74.2	45.3	17.2	17.2
RS	130	15	5	17.9	17.9	17.9	17.9
SC	1969	412	96	72.5	47.5	27.7	22.1
RC	1975	816	359	53.9	25.1	6.6	4.9
R	598	324	148	11.3	3.5	2.7	1.8
S	4001	330	121	37.0	23.1	13.2	11.3
C	4065	3191	1384	57.1	32.0	12.4	5.6
Others	5242	2730	1364	10.2	3.8	1.7	1.0

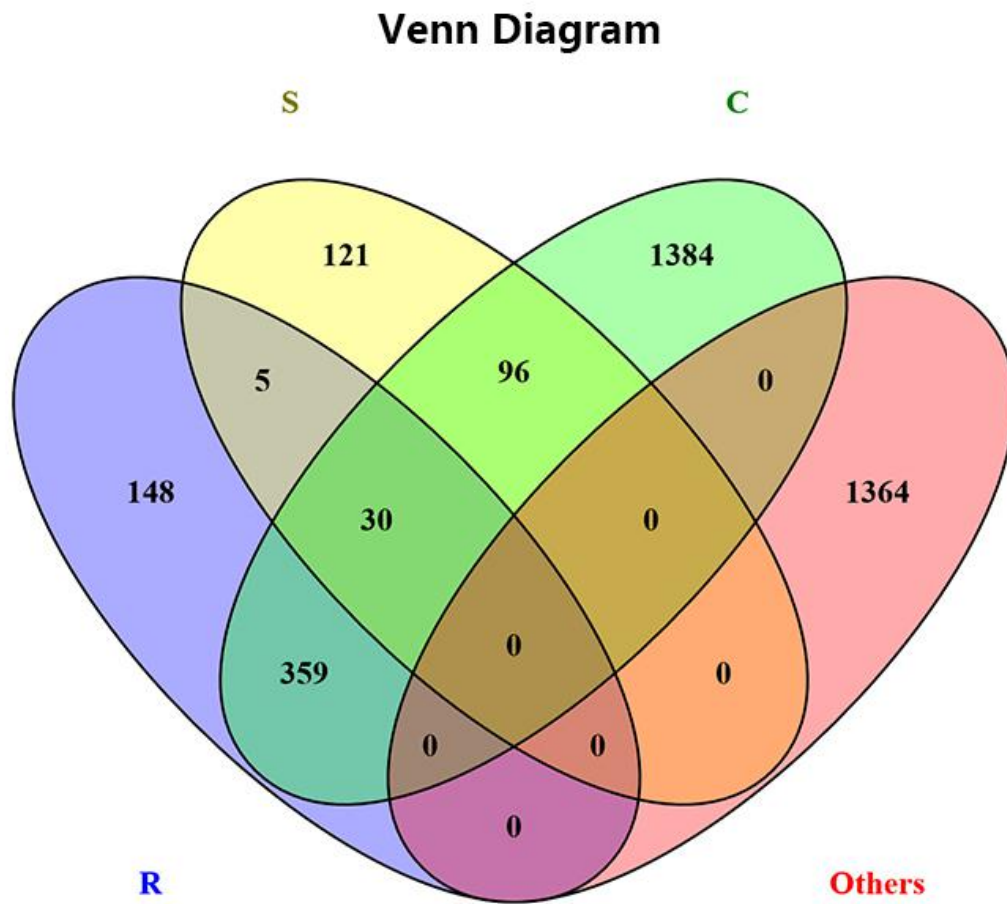
Abbreviations:

<sup>a</sup> including RSC: radiotherapy, surgery and chemotherapy, RS: radiotherapy and surgery, SC: chemotherapy and surgery, RC: radiotherapy and chemotherapy, R: only radiotherapy, S: only surgery, C: only chemotherapy, others: other treatment except for radiotherapy, surgery and chemotherapy.

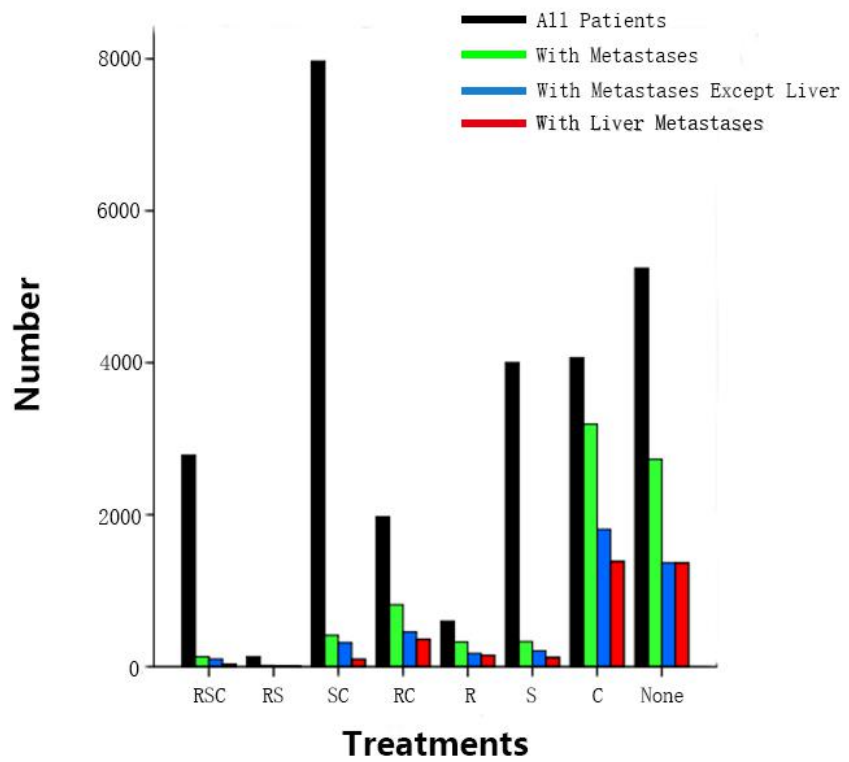
**Figure S1:** Data extraction flowchart from the SEER database.



**Figure S2:** Venn diagram of patients with GCLM at diagnosis stratified by treatments.



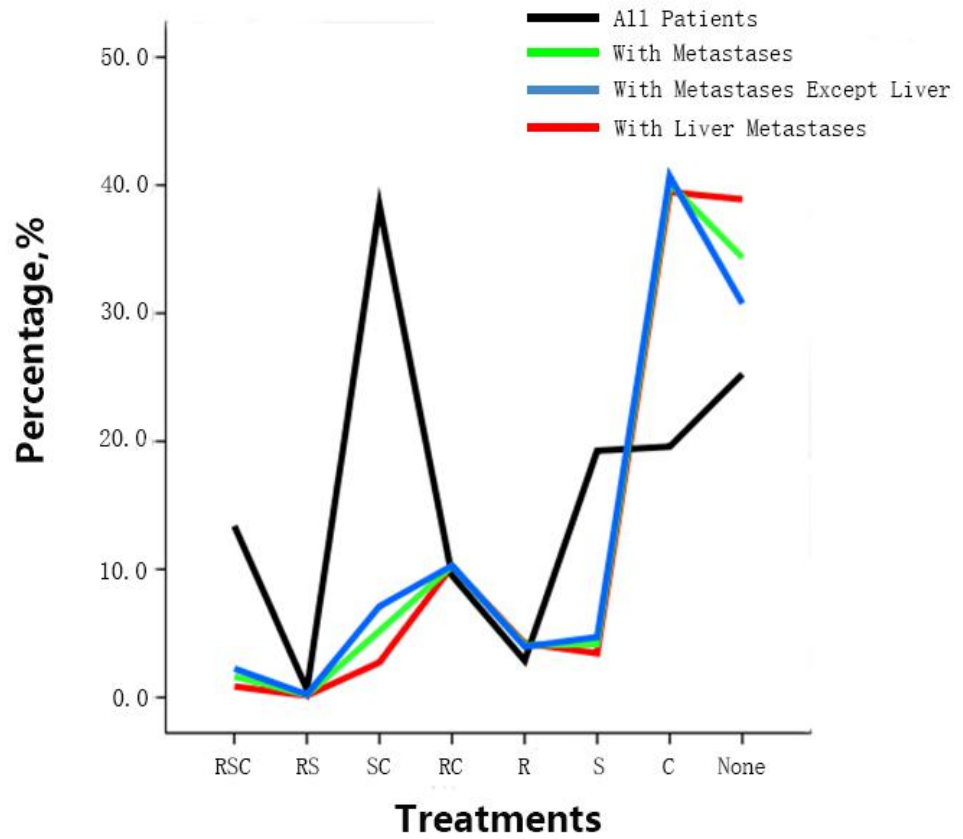
**Figure S3:** Number of patients with GC at diagnosis stratified by treatments.



No. at risk

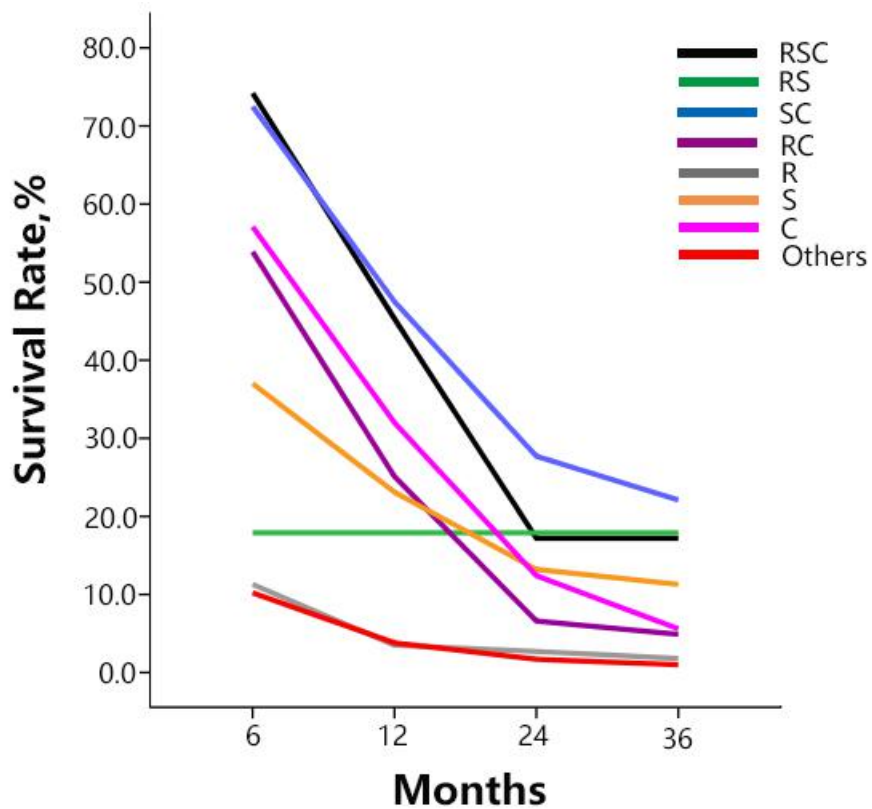
All Patients	2781	130	7969	1975	598	4001	4065	5242
With Metastases	130	15	412	816	324	330	3191	2730
With Metastases Except Liver	100	10	316	457	176	209	1807	1366
With Liver Metastases	30	5	96	359	148	121	1384	1364

**Figure S4:** Percentage of patients with GC stratified by treatments.



Percentage	RSC	RS	SC	RC	R	S	C	None
All Patients	13.40	0.63	9.48	9.51	2.88	19.27	19.58	25.25
With Metastases	1.64	0.19	5.18	10.27	4.08	4.15	40.15	34.35
With Metastases Except Liver	2.25	0.23	7.12	10.29	3.96	4.71	40.69	30.76
With Liver Metastases	0.86	0.14	2.74	10.24	4.22	3.45	39.46	38.89

**Figure S5:** The 6, 12, 24, 36-month survival rate of patients with GCLM stratified by treatments.



Survival rate,%				
	6	12	24	36
RSC	74.2	45.3	17.2	17.2
RS	17.9	17.9	17.9	17.9
SC	72.5	47.5	27.1	22.1
RC	53.9	25.1	6.6	4.9
R	11.3	3.5	2.7	1.8
S	37.0	23.1	13.2	11.3
C	57.1	32.0	12.4	5.6
Others	10.2	3.8	1.7	1.0