

**Supplementary Table 1. Survival outcomes of gastric cancer patients with different BMI.**

BMI values	Number	Median (year)	95% CI		Mean	3-year OS rate (%)	5-year OS rate (%)
			Lower	Upper			
Total gastric cancer <sup>1</sup>							
underweight	1,193	12.5	10.8	13.4	10.1 ± 0.2	73.16	65.83
healthy	6,862	13.0	12.5	13.3	10.5 ± 0.1	75.06	68.30
overweight	7,303	13.6	13.3	13.9	10.9 ± 0.1	78.09	71.92
obese	2,192	13.6	13.2	14.2	11.1 ± 0.2	78.65	72.28
No surgery <sup>2</sup>							
underweight	263	5.7	3.3	8.5	7.3 ± 0.4	59.81	53.06
healthy	1,246	5.0	4.0	5.9	7.0 ± 0.2	58.26	49.80
overweight	1,059	5.9	4.8	7.0	7.5 ± 0.2	60.03	52.73
obese	309	6.1	4.7	8.2	7.6 ± 0.4	64.75	54.14
Gastrectomy <sup>3</sup>							
underweight	930	14.0	13.1	14.7	11.0 ± 0.3	77.00	69.47
healthy	5,616	14.0	13.6	14.4	11.3 ± 0.1	78.85	72.48
overweight	6,244	14.2	14.0	14.6	11.6 ± 0.1	81.24	75.27
obese	1,883	14.4	13.6	14.7	11.8 ± 0.2	80.97	75.35
Only curative gastrectomy <sup>4</sup>							
underweight	812	14.1	13.1	14.7	11.0 ± 0.3	77.00	69.86
healthy	5,137	14.3	13.9	14.6	11.4 ± 0.1	78.78	72.91
overweight	5,779	14.3	14.1	14.7	11.7 ± 0.1	81.29	76.03
obese	1,739	14.5	13.7	14.8	11.8 ± 0.2	80.61	75.74

<sup>1</sup>Total gastric cancer:  $P < 0.001$ ;

<sup>2</sup>No surgery:  $P = 0.26$ ;

<sup>3</sup>Gastrectomy:  $P < 0.001$ ;

<sup>4</sup>Only curative gastrectomy:  $P = 0.002$ .

**Supplementary Table 2. Survival outcomes of gastric cancer patients with smoking status.**

	Number	Median (year)	95% CI		Mean	3-year OS rate (%)	5-year OS rate (%)
			Lower	Upper			
Total gastric cancer <sup>1</sup>							
Never	10,236	13.5	13.3	13.7	10.8 ± 0.1	76.15	70.39
Ex-smoker	5,150	12.7	12.1	13.2	10.4 ± 0.1	76.15	69.05
Current-smoker	2,311	13.0	11.8	13.7	10.6 ± 0.2	78.16	69.13
No surgery <sup>2</sup>							
Never	1,711	5.7	4.8	6.8	7.4 ± 0.2	58.41	51.86
Ex-smoker	924	5.4	4.5	7.0	7.1 ± 0.2	60.86	51.42
Current-smoker	351	5.7	4.4	6.8	7.4 ± 0.4	63.60	53.30
Gastrectomy <sup>3</sup>							
Never	8,525	14.3	14.1	14.6	11.6 ± 0.1	79.77	74.18
Ex-smoker	4,226	13.9	13.5	14.5	11.2 ± 0.1	79.56	73.01
Current-smoker	1,960	14.0	13.2	14.7	11.4 ± 0.2	80.85	72.10
Only curative gastrectomy <sup>4</sup>							
Never	7,822	14.4	14.2	14.6	11.7 ± 0.1	79.96	74.85
Ex-smoker	1,780	14.1	13.6	14.6	11.3 ± 0.1	79.12	73.23
Current-smoker	3,915	14.2	13.5	15.0	11.5 ± 0.2	81.02	73.33

<sup>1</sup>Total gastric cancer:  $P = 0.051$ ;

<sup>2</sup>No surgery:  $P = 0.83$ ;

<sup>3</sup>Gastrectomy:  $P = 0.06$ ;

<sup>4</sup>Only curative gastrectomy:  $P = 0.08$ .

**Supplementary Table 3. Survival outcomes of gastric cancer patients with drinking status.**

	Number	Median (year)	95% CI		Mean	3-year OS rate	5-year OS rate
			Lower	Upper		(%)	(%)
Total gastric cancer <sup>1</sup>							
Never	11,567	13.5	13.2	13.6	10.7 ± 0.1	75.88	69.91
Ex-drinker	5,197	12.8	12.4	13.3	10.6 ± 0.1	77.25	70.07
Current-drinker	920	9.2	7.3	14	10.2 ± 0.4	78.22	66.46
No surgery <sup>2</sup>							
Never	1,914	6.0	4.8	7.0	7.4 ± 0.2	58.83	51.98
Ex-drinker	922	5.6	4.6	6.8	7.1 ± 0.2	61.58	52.34
Current-drinker	148	4.2	3.1	5.4	5.4 ± 0.7	60.22	44.50
Gastrectomy <sup>3</sup>							
Never	9,653	14.2	14.0	14.5	11.5 ± 0.1	79.33	73.55
Ex-drinker	4,275	14.0	13.6	14.6	11.4 ± 0.1	80.69	74.02
Current-drinker	772	14.0	9.2	16.3	11.3 ± 0.4	81.82	70.77
Only curative gastrectomy <sup>4</sup>							
Never	8,864	14.3	14.1	14.6	11.6 ± 0.1	79.30	74.02
Ex-drinker	3,945	14.3	13.7	14.7	11.5 ± 0.1	80.61	74.71
Current-drinker	694	14.8	10.2	16.5	11.7 ± 0.5	82.68	72.99

<sup>1</sup>Total gastric cancer: *P*=0.06;

<sup>2</sup>No surgery: *P*=0.009;

<sup>3</sup>Gastrectomy: *P*=0.65;

<sup>4</sup>Only curative gastrectomy: *P*=0.83.

**Supplementary Table 4. Survival outcomes of gastric cancer patients with both smoking and drinking status.**

	Number	Median (year)	95% CI		Mean	3-year OS rate (%)	5-year OS rate (%)
<b>Total gastric cancer<sup>1</sup></b>							
Ever-smoking (-)/ever-drinking (-)	9,073	13.6	13.4	13.9	10.9 ± 0.1	76.19%	70.64%
Ever-smoking (+)/ever-drinking (-)	2,485	12.3	11.1	13.2	10.2 ± 0.2	74.72%	67.17%
Ever-smoking (-)/ever-drinking (+)	1,161	11.8	9.7	12.9	10.1 ± 0.2	75.77%	68.17%
Ever-smoking (+)/ever-drinking (+)	4,947	12.9	12.4	13.5	10.7 ± 0.1	77.80%	70.14%
<b>No surgery<sup>2</sup></b>							
Ever-smoking (-)/ever-drinking (-)	1,518	5.8	4.7	7.0	7.4 ± 0.2	58.17%	51.83%
Ever-smoking (+)/ever-drinking (-)	395	6.4	4.4	8.1	7.5 ± 0.3	61.51%	52.62%
Ever-smoking (-)/ever-drinking (+)	193	5.2	3.7	6.6	6.9 ± 0.5	60.27%	51.76%
Ever-smoking (+)/ever-drinking (+)	876	5.4	4.5	6.2	7.0 ± 0.2	61.58%	51.50%
<b>Gastrectomy<sup>3</sup></b>							
Ever-smoking (-)/ever-drinking (-)	7,555	14.4	14.2	14.6	11.6 ± 0.1	79.87%	74.48%
Ever-smoking (+)/ever-drinking (-)	2,090	13.3	12.7	14.0	10.8 ± 0.2	77.31%	70.04%
Ever-smoking (-)/ever-drinking (+)	968	13.1	12.0	14.1	10.8 ± 0.3	78.96%	71.59%
Ever-smoking (+)/ever-drinking (+)	4,071	14.4	13.8	14.7	11.6 ± 0.1	81.36%	74.28%
<b>Only curative gastrectomy<sup>4</sup></b>							
Ever-smoking (-)/ever-drinking (-)	6,934	14.5	14.2	14.7	11.7 ± 0.1	80.03%	75.07%
Ever-smoking (+)/ever-drinking (-)	1,924	13.5	13.0	14.2	10.9± 0.2	76.64%	70.14%
Ever-smoking (-)/ever-drinking (+)	886	13.4	12.2	14.4	11.0 ± 0.3	79.35%	73.06%
Ever-smoking (+)/ever-drinking (+)	3,746	14.6	14.0	14.8	11.7 ± 0.1	81.29%	75.01%

<sup>1</sup>Total gastric cancer:  $P < 0.001$ ;

<sup>2</sup>No surgery:  $P = 0.47$ ;

<sup>3</sup>Gastrectomy:  $P < 0.001$ ;

<sup>4</sup>Only curative gastrectomy:  $P < 0.001$ .

Prognostic Factors	No. of Deaths, n (%)	Total (n=18,322)					No surgery (n=3,142)				
		Median OS (years)	HR	95% CI		P Value	Median OS (years)	HR	95% CI		P Value
				Lower	Upper				Lower	Upper	
Gender											
Male	3,493 (74.2)	13.2 (13.0-13.4)	1.00				6.1 (5.4-6.9)	1.00			
Female	1,205 (25.6)	13.7 (13.3-14.0)	1.04	0.99	1.09	0.1	4.4 (3.3-5.8)	1.10	1.01	1.21	0.04
Age at diagnosis (years)											
Younger (≤35)	185 (3.9)	13.6 (11.8-14.5)	1.00				5.0 (1.5-6.2)	1.00			
Middle-aged (36-65)	3,076 (65.4)	13.4 (13.1-13.6)	1.01	0.90	1.12	0.91	5.0 (4.4-5.8)	0.88	0.71	1.07	0.20
Older (≥66)	1,361 (28.9)	13.1 (12.8-13.4)	1.06	0.95	1.19	0.32	7.0 (6.0-7.8)	0.78	0.64	0.97	0.02
BMI (kg/m²) at diagnosis											
<18.5	371 (7.9)	12.5 (10.8-13.4)	1.06	0.97	1.15	0.19	5.7 (3.3-8.5)	1.01	0.87	1.18	0.89
18.5-22.9	1882 (40.0)	13.0 (12.5-13.3)	1.00				5.0 (4.0-5.9)	1.00			
23-27.4	1692 (36.0)	13.6 (13.3-13.9)	0.92	0.88	0.96	<0.001	5.9 (4.8-7.0)	0.92	0.83	1.01	0.07
≥27.5	500 (10.6)	13.6 (13.2-14.2)	0.89	0.83	0.96	0.001	6.1 (4.7-8.2)	0.91	0.79	1.06	0.23
Usual BMI (kg/m²)											
<18.5	178 (3.8)	10.9 (9.8-13.4)	1.08	0.96	1.23	0.19	5.3 (1.9-8.2)	1.14	0.89	1.45	0.30
18.5-22.9	1308 (27.8)	12.3 (11.8-12.8)	1.00				4.5 (3.5-5.8)	1.00			
23-27.4	1671 (35.5)	12.9 (12.5-13.3)	0.98	0.93	1.03	0.41	5.2 (4.4-6.1)	0.94	0.85	1.05	0.29
≥27.5	688 (14.6)	12.8 (12.2-13.4)	0.99	0.93	1.06	0.82	4.9 (4.2-6.4)	0.95	0.83	1.09	0.46
Weight loss as % of usual weight											
None	836 (17.8)	14.3 (14.1-14.6)	1.00				9.3 (7.2-11.6)	1.00			
0-10	3,244 (68.9)	12.8 (12.6-13.2)	1.03	0.97	1.08	0.33	5.2 (4.7-6.0)	1.17	1.06	1.30	0.003
≥10	627 (13.3)	9.0 (8.1-10.5)	1.36	1.26	1.47	<0.001	4.4 (3.2-5.7)	1.26	1.10	1.43	<0.001
Smoking status											
Never smokers	2,726 (57.9)	13.5 (13.3-13.7)	1.00				5.7 (4.8-6.8)	1.00			
Smokers	1,814 (38.5)	12.7 (12.3-13.2)	1.03	0.99	1.07	0.20	5.6 (4.8-6.7)	0.99	0.90	1.07	0.73
Current smokers	1,329 (28.2)	12.7 (12.1-13.2)	1.05	1.00	1.11	0.04	5.4 (4.5-7.0)	1.00	0.91	1.10	0.95
Ex-smokers	485 (10.3)	13.0 (11.8-13.7)	0.97	0.91	1.04	0.41	5.7 (4.4-6.8)	0.94	0.81	1.08	0.36
Time since quitting smoking											

Short-term (1-9 years)	289 (6.1)	12.8 (11.6-13.9)	1.00				6.2 (4.4-7.3)	1.00			
Long-term (≥10 years)	196 (4.2)	12.8 (10.7-14.0)	1.09	0.96	1.24	0.19	5.2 (3.1-8.3)	0.98	0.75	1.28	0.89
<b>No. of cigarettes (per day)</b>											
≤20 (1 pack)	1,313 (27.9)	12.7 (12.1-13.2)	1.00				5.2 (4.4-6.3)	1.00			
21-39	128 (2.7)	10.8 (7.9-13.7)	1.08	0.94	1.24	0.28	5.0 (2.1-7.3)	1.31	1.02	1.68	0.04
≥40 (≥2 packs)	189 (4.0)	12.3 (9.3-13.2)	1.05	0.93	1.17	0.44	8.5 (6.2-9.6)	0.93	0.74	1.17	0.53
<b>Duration of smoking (years)</b>											
1-29	637 (13.5)	13.1 (12.3-13.9)	1.00				5.5 (3.8-6.8)	1.00			
≥30	1,011 (21.5)	12.1 (11.1-12.7)	1.12	1.05	1.21	0.002	5.6 (4.8-7.1)	0.93	0.80	1.07	0.30
<b>Alcohol consumption</b>											
Never drinkers	3,078 (65.4)	13.5 (13.2-13.6)	1.00				6.0 (4.8-7.0)	1.00			
Drinkers	1,457 (31.0)	12.7 (12.2-13.2)	1.01	0.96	1.06	0.74	5.4 (4.6-6.1)	1.02	0.93	1.12	0.65
Current drinkers	1,294 (27.5)	12.8 (12.4-13.3)	1.01	0.96	1.06	0.65	5.6 (4.6-6.8)	1.01	0.92	1.11	0.88
Ex-drinkers	163 (3.5)	9.2 (7.3-14.0)	0.98	0.87	1.11	0.79	4.2 (3.1-5.4)	1.15	0.92	1.43	0.23
<b>Amount of alcohol consumption</b>											
Light drinkers (<15.6 g/d)	11 (0.2)	15.2 (9.0-17.7)	1.00				2.1 (0.4-16.2)	1.00			
Moderate drinkers (≥15.6 g/d to <53.5 g/d)	147 (3.1)	12.8 (10.9-14.4)	1.23	0.85	1.79	0.27	2.7 (1.8-3.7)	0.87	0.40	1.88	0.71
Heavy drinkers (≥53.5 g/d)	851 (18.1)	12.7 (12.0-13.3)	1.28	0.90	1.83	0.17	5.7 (4.7-6.8)	0.78	0.37	1.64	0.51
<b>pTNM</b>											
I	135 (2.9)	15.8 (15.5-16.2)	1.00				— <sup>1</sup>	1.00			
II	320 (6.8)	14.6 (13.7-14.7)	1.58	1.41	1.77	<0.001	7.0 (0.5-11.4)	3.74	0.46	30.17	0.22
III	2,156 (45.8)	13.3 (13.1-13.6)	2.45	2.26	2.66	<0.001	5.2 (1.8-10.2)	3.82	0.52	27.89	0.19
IV	1,210 (25.7)	4.4 (3.9-4.9)	4.64	4.24	5.08	<0.001	3.9 (3.5-4.7)	4.19	0.59	29.55	0.15
<b>Type of gastrectomy</b>											
Gastrectomy	3,154 (67.0)	14.3 (14.1-14.5)	1.00				—	—			
No surgery	1,553 (33.0)	5.8 (5.2-6.5)	2.13	2.03	2.23	<0.001	—	—	—	—	—
<b>Assitant therapy</b>											
No neo/adjuvant	108 (2.3)	15.3 (15.1-15.8)	1.00				—	—			
Neoadjuvant	84 (1.8)	5.9 (4.7-10.8)	3.37	2.77	4.11	<0.001	—	—	—	—	—
Adjuvant	1,053 (22.4)	13.8 (13.2-14.3)	1.87	1.66	2.11	<0.001	—	—	—	—	—
Neo + adjuvant	133 (2.8)	7.6 (6.4-8.9)	2.45	2.05	2.94	<0.001	—	—	—	—	—

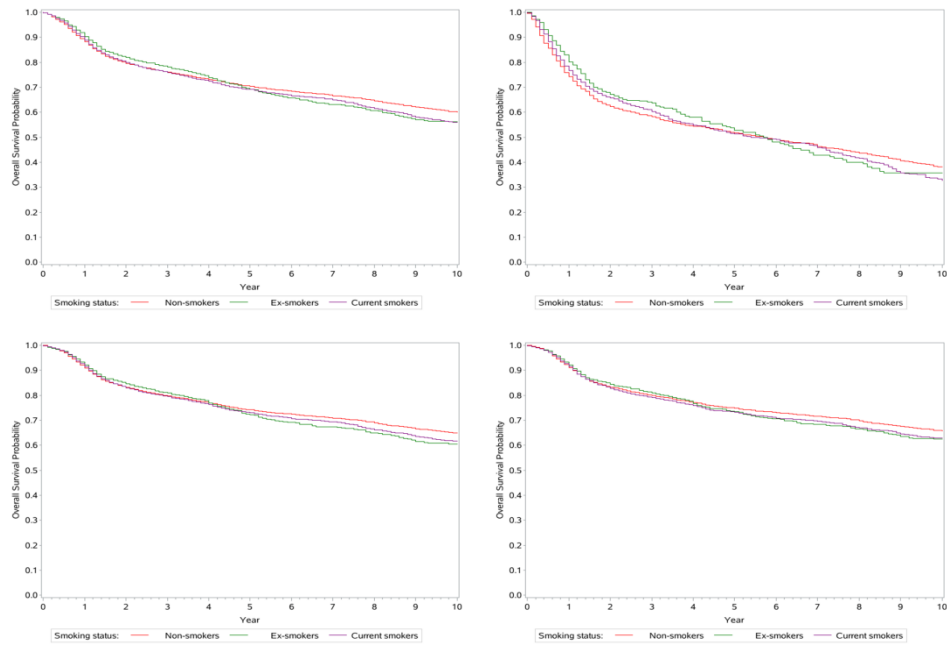
Supplementary Table 5. Continued.

Gastrectomy (n=15,180)					Only curative gastrectomy (n=13,695)				
Median OS (years)	HR	95% CI		P Value	Median OS (years)	HR	95% CI		P Value
		Lower	Upper				Lower	Upper	
14.1 (13.9-14.4)	1.00				14.2 (13.9-14.4)	1.00			
14.7 (14.3-14.8)	1.03	0.97	1.08	0.33	14.7 (14.4-14.9)	1.02	0.96	1.08	0.57
14.8 (14.2-15.7)	1.00				15.1 (14.4-15.8)	1.00			
14.3 (14.0-14.6)	1.08	0.95	1.23	0.26	14.4 (14.1-14.7)	1.10	0.96	1.27	0.16
14.0 (13.6-14.3)	1.15	1.01	1.32	0.04	14.1 (13.7-14.4)	1.18	1.02	1.36	0.02
14.0 (13.1-14.7)	1.03	0.93	1.14	0.55	14.1 (13.1-14.7)	1.05	0.94	1.17	0.37
14.0 (13.6-14.4)	1.00				14.3 (13.9-14.6)	1.00			
14.2 (14.0-14.6)	0.95	0.90	1.00	0.04	14.3 (14.1-14.7)	0.94	0.89	1.00	0.049
14.4 (13.6-14.7)	0.91	0.84	0.99	0.03	14.5 (13.7-14.8)	0.92	0.85	1.01	0.07
13.7 (11.9-14.8)	1.08	0.94	1.25	0.29	13.6 (11.1-14.7)	1.12	0.96	1.30	0.15
13.7 (13.2-14.6)	1.00				14.0 (13.4-14.8)	1.00			
14.0 (13.5-14.3)	1.00	0.94	1.07	0.98	14.1 (13.6-14.6)	0.99	0.93	1.06	0.77
13.8 (13.2-14.6)	1.00	0.92	1.08	0.89	13.9 (13.3-14.7)	0.99	0.91	1.08	0.83
14.8 (14.7-14.9)	1.00				14.7 (14.6-14.9)	1.00			
14.0 (13.6-14.3)	1.05	0.99	1.12	0.12	14.2 (13.8-14.6)	1.04	0.97	1.11	0.31
12.5 (11.0-13.3)	1.31	1.2	1.44	<0.001	13.1 (11.8-13.8)	1.27	1.15	1.4	<0.001
14.3 (14.1-14.6)	1.00				14.4 (14.2-14.6)	1.00			
14.0 (13.6-14.4)	1.03	0.98	1.09	0.21	14.2 (13.7-14.6)	1.04	0.98	1.09	0.18
13.9 (13.5-14.5)	1.05	0.99	1.11	0.09	14.1 (13.6-14.6)	1.06	1.00	1.13	0.047
14.0 (13.2-14.7)	0.99	0.92	1.07	0.84	14.2 (13.5-15.0)	0.98	0.9	1.06	0.62
14.0 (13.0-15.0)	1.00				14.2 (13.5-15.2)	1.00			
14.0 (12.2-15.0)	1.08	0.93	1.25	0.33	14.5 (13.0-15.1)	1.08	0.93	1.27	0.32
13.8 (13.5-14.2)	1.00				14.0 (13.6-14.6)	1.00			
13.9 (12.5-15.4)	1.00	0.85	1.17	0.95	13.9 (12.5-15.4)	1.00	0.85	1.19	0.97
13.3 (12.6-14.6)	1.07	0.94	1.22	0.31	13.3 (12.8-14.8)	1.06	0.92	1.22	0.40
14.3 (13.8-14.8)	1.00				14.6 (14.0-15.0)	1.00			
13.5 (13.0-13.8)	1.16	1.07	1.26	<0.001	13.6 (13.2-14.0)	1.17	1.07	1.27	<0.001
14.2 (14.0-14.5)	1.00				14.3 (14.1-14.6)	1.00			

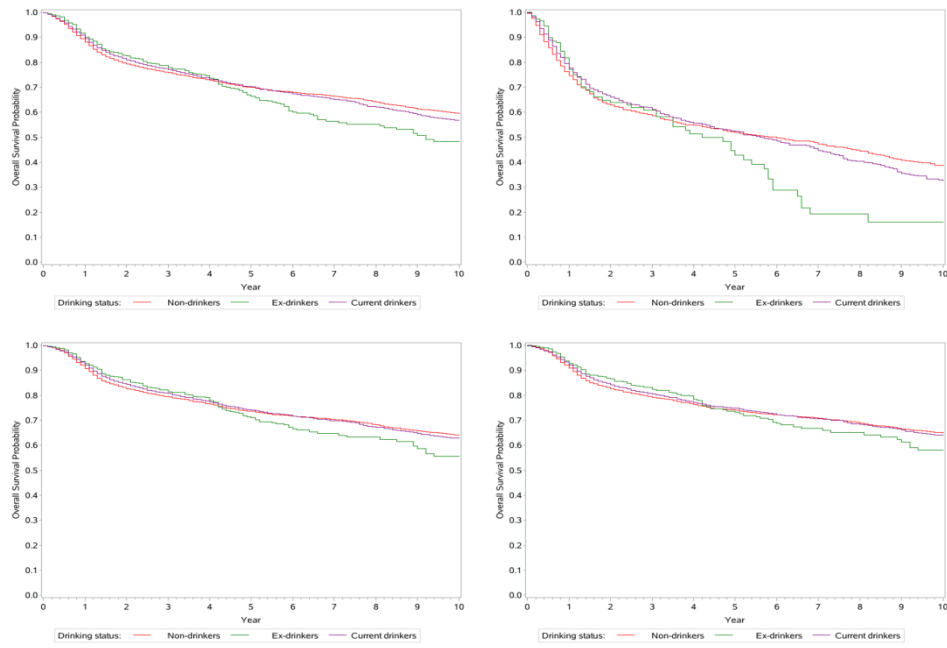
14.0 (13.6-14.6)	0.99	0.94	1.05	0.78	14.3 (13.8-14.7)	0.99	0.93	1.04	0.64
14.0 (13.6-14.6)	1.00	0.94	1.06	0.94	14.3 (13.7-14.7)	1.00	0.94	1.06	0.96
14.0 (9.2-16.3)	0.95	0.83	1.09	0.47	14.8 (10.2-16.5)	0.90	0.78	1.04	0.15
15.2 (9.0-18.2)	1.00				15.2 (9.0-17.7)	1.00			
13.6 (11.8-15.0)	1.24	0.81	1.89	0.33	13.8 (11.9-15.0)	1.03	0.67	1.57	0.90
13.7 (13.4-14.4)	1.33	0.88	1.99	0.17	13.9 (13.6-14.6)	1.09	0.73	1.63	0.68
15.8 (15.5-16.2)	1.00				15.8 (15.5-16.3)	1.00			
14.6 (13.7-14.7)	1.58	1.41	1.77	<0.001	14.7 (14.1-14.8)	1.49	1.33	1.68	<0.001
13.3 (13.1-13.6)	2.42	2.23	2.63	<0.001	13.5 (13.2-13.7)	2.34	2.15	2.55	<0.001
5.0 (4.3-6.3)	3.71	3.3	4.17	<0.001	6.0 (4.5-7.0)	3.45	3.05	3.90	<0.001
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15.3 (15.1-15.8)	1.00				15.3 (15.1-15.8)	1.00			
5.9 (4.7-10.8)	3.48	2.86	4.24	<0.001	5.9 (4.5-10.8)	3.67	2.98	4.52	<0.001
13.8 (13.2-14.3)	1.85	1.64	2.09	<0.001	14.1 (13.6-14.5)	1.91	1.68	2.18	<0.001
7.6 (6.4-8.9)	2.53	2.11	3.02	<0.001	7.6 (6.4-8.9)	2.61	2.15	3.16	<0.001

<sup>1</sup>The number of patients is too small to calculate the median OS and its 95% confidence interval.





**Supplementary Figure 1. Kaplan-Meier survival curves for overall survival of smoking status. A: Total gastric cancer patients; B: No surgery patients; C: Gastrectomy patients; D: Only curative gastrectomy patients.**



**Supplementary Figure 2. Kaplan-Meier survival curves for overall survival of drinking status. A: Total gastric cancer patients; B: No surgery patients; C: Gastrectomy patients; D: Only curative gastrectomy patients.**