

Supplementary materials

The association between poor dental health and gastric cancer risk: a nationwide cohort and sibling-controlled study

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Table S1. Baseline characteristics of individuals stratified by sex.

Characteristics	Male (N=2,869,265)	Female (N=3,018,769)	All participants (N=5,888,034)
Follow-up years (mean $\pm$ SD)	6.27 (2.03)	6.44 (1.92)	6.36 (1.98)
Age (years, mean $\pm$ SD)	46.79 (18.48)	47.78 (19.22)	47.30 (18.87)
Dental health condition			
Healthy	1,331,757 (46.4)	1,541,802 (51.1)	2,873,559 (48.8)
Caries	485,794 (16.9)	476,377 (15.8)	962,171 (16.3)
Root canal infection	146,805 (5.1)	119,236 (3.9)	266,041 (4.5)
Mild inflammation	551,144 (19.2)	550,487 (18.2)	1,101,631 (18.7)
Periodontitis	353,765 (12.3)	330,867 (11.0)	684,632 (11.6)
Number of teeth at baseline			
>27	1,610,280 (56.1)	1,559,144 (51.6)	3,169,424 (53.8)
>24 & $\leq$ 27	427,652 (14.9)	522,887 (17.3)	950,539 (16.1)
>20 & $\leq$ 24	206,937 (7.2)	270,849 (9.0)	477,786 (8.1)
>14 & $\leq$ 20	112,178 (3.9)	144,440 (4.8)	256,618 (4.4)
$\leq$ 14	85,380 (3.0)	101,233 (3.4)	186,613 (3.2)
Unknown	426,838 (14.9)	420,216 (13.9)	847,054 (14.4)
Education			
Primary education and below ($\leq$ 9 years)	545,321 (19.0)	505,266 (16.7)	1,050,587 (17.8)
High school education (10 to 11 years)	1,443,494 (50.3)	1,424,887 (47.2)	2,868,381 (48.7)
College education or higher ($\geq$ 12 years)	797,579 (27.8)	1,003,822 (33.3)	1,801,401 (30.6)
Unknown	82,871 (2.9)	84,794 (2.8)	167,665 (2.8)
Family income			
Low	800,553 (27.9)	1,052,997 (34.9)	1,853,550 (31.5)
Medium	971,484 (33.9)	952,557 (31.6)	1,924,041 (32.7)
High	1,097,228 (38.2)	1,013,215 (33.6)	2,110,443 (35.8)
Family history of gastric cancer			
No	2,781,899 (97.0)	2,923,136 (96.8)	5,705,035 (96.9)
Yes	47,229 (1.6)	49,422 (1.6)	96,651 (1.6)
Unknown	40,137 (1.4)	46,211 (1.5)	86,348 (1.5)
Alcohol-related diseases			
No	2,776,163 (96.8)	2,961,568 (98.1)	5,737,731 (97.4)
Yes	93,102 (3.2)	57,201 (1.9)	150,303 (2.6)
Smoking-related diseases			
No	2,828,669 (98.6)	2,974,132 (98.5)	5,802,801 (98.6)
Yes	40,596 (1.4)	44,637 (1.5)	85,233 (1.4)

Table S2. The risk of gastric cancer and its subtypes in relation to a combination of dental inflammatory conditions and number of remaining teeth ^a.

Group ^b	Total gastric cancer		Cardia gastric cancer		Non-cardia gastric cancer	
	No. of cases	HR (95% CI) ^c	No. of cases	HR (95% CI) ^c	No. of cases	HR (95% CI) ^c
No inflammation/Localized inflammation & >27	616	Ref.	212	Ref.	404	Ref.
No inflammation/Localized inflammation & 25-27	510	1.08 (0.95, 1.22)	148	1.00 (0.80, 1.25)	362	1.11 (0.96, 1.29)
No inflammation/Localized inflammation & 21-24	431	1.25 (1.09, 1.42)**	128	1.42 (1.12, 1.79)**	303	1.18 (1.00, 1.39)*
No inflammation/Localized inflammation 15-20	365	1.53 (1.32, 1.76)***	112	1.87 (1.44, 2.42)***	253	1.40 (1.18, 1.67)***
No inflammation/Localized inflammation & ≤14	296	1.58 (1.35, 1.85)***	79	1.78 (1.33, 2.38)***	217	1.50 (1.25, 1.81)***
No inflammation/Localized inflammation & Unknown	272	1.39 (1.19, 1.61)***	81	1.36 (1.04, 1.78)*	191	1.40 (1.17, 1.67)***
Mild/Severe inflammation & >27	380	1.11 (0.97, 1.26)	137	1.12 (0.90, 1.40)	243	1.10 (0.93, 1.29)

Mild/Severe inflammation & 25-27	325	1.10 (0.95, 1.27)	118	1.27 (1.00, 1.61)*	207	1.03 (0.86, 1.22)
Mild/Severe inflammation & 21-24	316	1.41 (1.22, 1.64)***	90	1.49 (1.14, 1.94)**	226	1.38 (1.16, 1.65)***
Mild/Severe inflammation 15-20	216	1.50 (1.27, 1.77)***	62	1.74 (1.29, 2.36)***	154	1.40 (1.15, 1.72)***
Mild/Severe inflammation & ≤14	152	1.68 (1.38, 2.03)***	39	1.80 (1.25, 2.59)**	113	1.62 (1.29, 2.04)***
Mild/Severe inflammation & Unknown	114	1.29 (1.04, 1.59)*	35	1.28 (0.88, 1.88)	79	1.29 (1.00, 1.66)
Total	3,993		1,241		2,752	

^a: *P* for interaction was 0.379 for total gastric cancer, 0.561 for cardia gastric cancer, and 0.345 for non-cardia gastric cancer.

^b: Mild/Severe inflammation encompasses both mild inflammation and periodontitis; no inflammation/localized inflammation includes healthy, caries, and root canal infection.

^c: All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, and adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases.

*: *p* < 0.05; **: *p* < 0.01; ***: *p* < 0.001.

Abbreviations: HR, hazard ratio; CI, confidence interval.

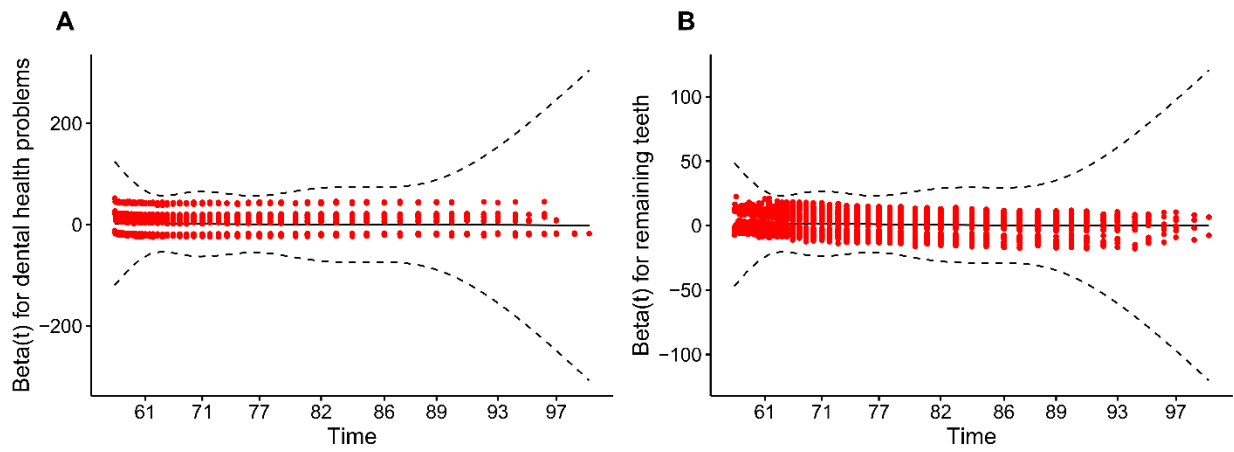


Fig. S1. Schoenfeld residual plots. (A) Dental health condition; (B) Remaining teeth.

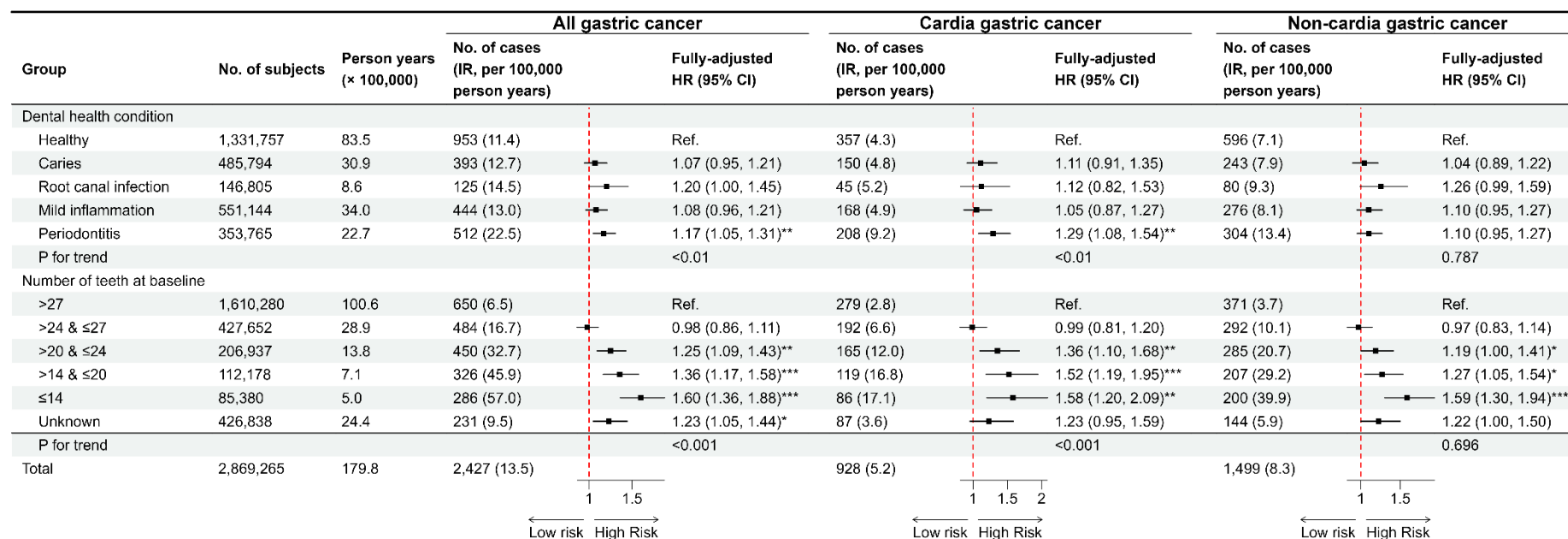


Fig. S2. The association between baseline dental health condition and the risk of gastric cancer among male individuals in the Swedish Dental Health Register, 2009-2016. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

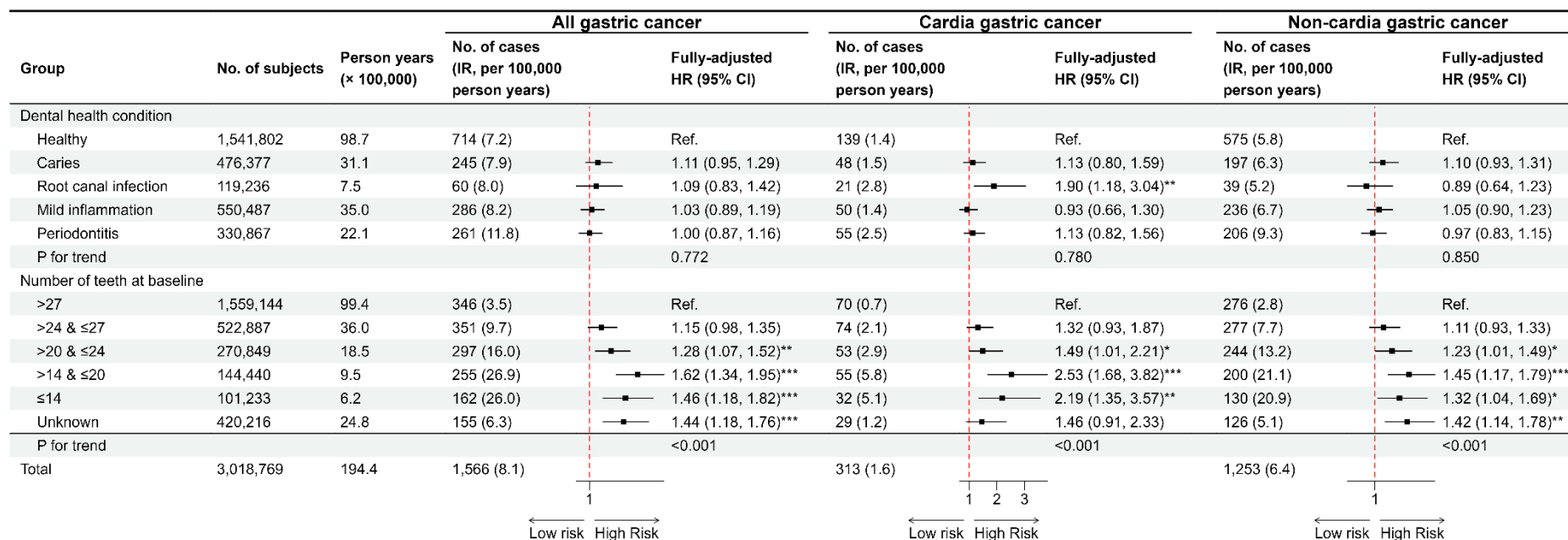


Fig. S3. The association between baseline dental health condition and the risk of gastric cancer among female individuals in the Swedish Dental Health Register, 2009-2016. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: *p* < 0.05; **: *p* < 0.01; ***: *p* < 0.001.

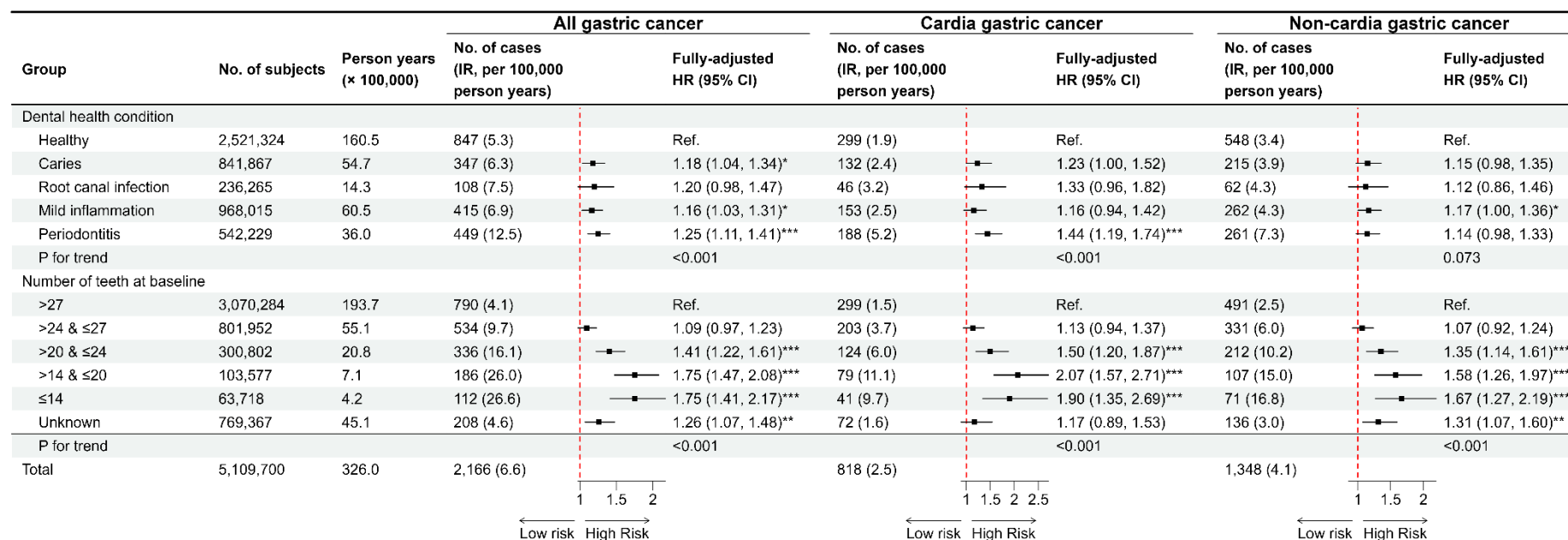


Fig. S4. The association between baseline dental health condition and the risk of gastric cancer among individuals aged ≤70 years old in the Swedish Dental Health Register, 2009-2016. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: *p* < 0.05; **: *p* < 0.01; ***: *p* < 0.001.

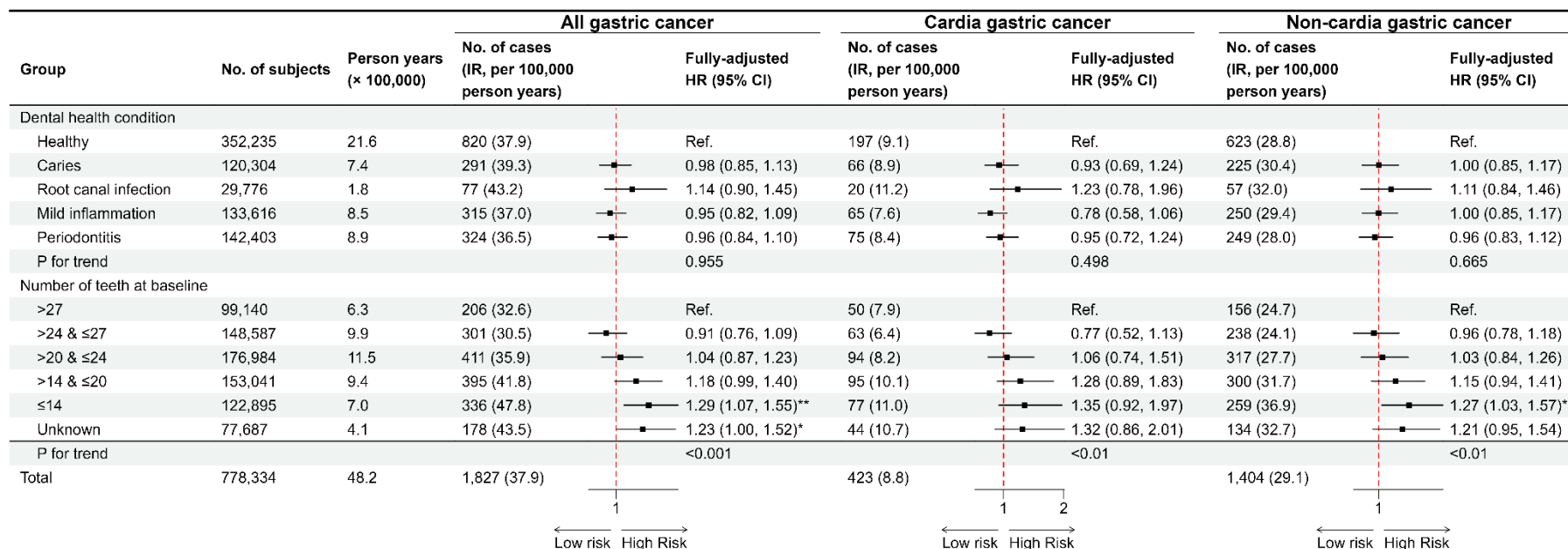


Fig. S5. The association between baseline dental health condition and the risk of gastric cancer among individuals aged >70 years old in the Swedish Dental Health Register, 2009-2016. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: *p* < 0.05; **: *p* < 0.01; ***: *p* < 0.001.

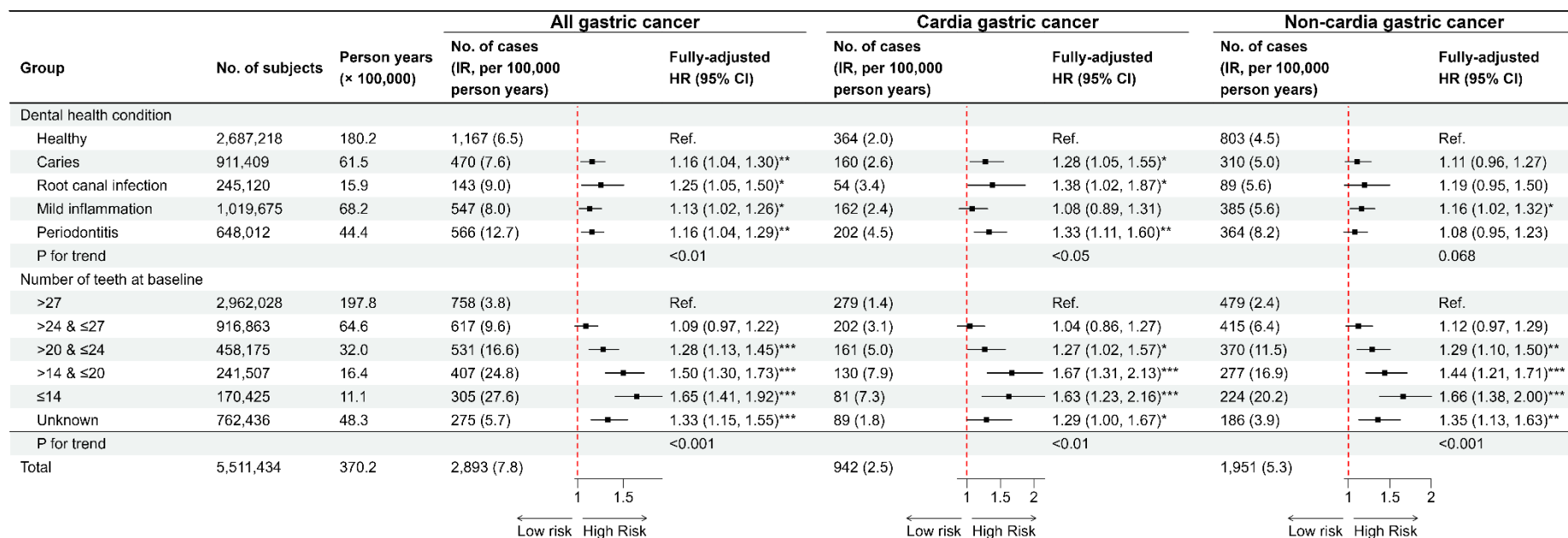


Fig. S6. The association between baseline dental health condition and the risk of gastric cancer after excluding incident cases and follow-up data observed within the first two years. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

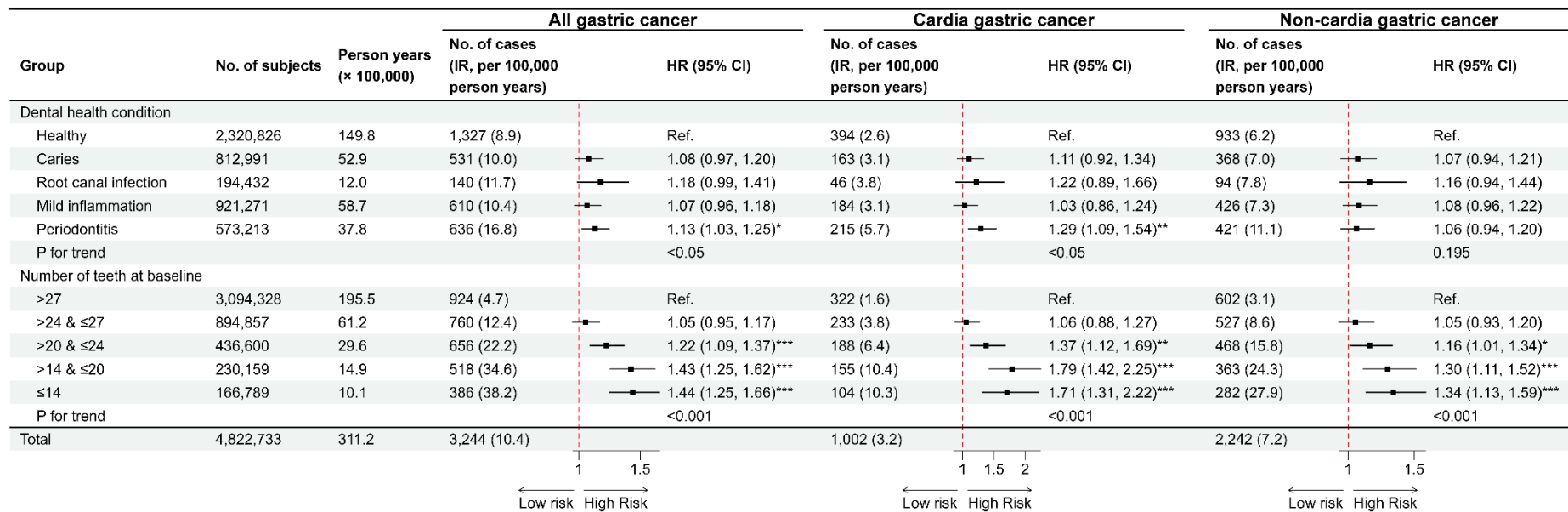


Fig. S7. The association between baseline dental health condition and the risk of gastric cancer after excluding participants with missing covariate data. All HR and 95% CI estimates were derived from Cox models with attained age as time-scale, adjusted for sex, age at entry, family income, education, family history of gastric cancer, smoking-related diseases, and alcohol-related diseases. Trend analyses were performed by Cochran-Armitage test. The 'unknown' group was excluded from the calculation of *p*-trend. Abbreviations: IR, incidence rate; HR, hazard ratio; CI, confidence interval. *: *p* < 0.05; **: *p* < 0.01; ***: *p* < 0.001.