

Supplementary materials

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36 **Supplementary Methods 1. Dietary assessment**

37 The 24-hour dietary assessments of UK Biobank collected the consumption of up to 206 types of foods and 32 types of drinks
38 during the previous 24 hours since recruitment¹. Participants recorded the intake for each food item with standard portion size. The
39 total intake of nutrients was computed by summing up the nutrient content of each contributing food item multiplied by its
40 consumption daily. The total energy intake was calculated by summing up the calorie contributed from each food item multiplied by
41 its consumption daily.

42 **Supplementary Methods 2. Outcome ascertainment**

43 ICD-10 codes of IBD were K500, K501, K508-K515, K518 and K519. ICD-10 codes of polyps were K621 and K635. ICD-10
44 codes of adenomas were D122-D126. ICD-10 codes of IBS were K580 and K589. ICD-10 codes of GORD were K210 and K219.
45 ICD-10 codes of PUD were K250-K257, K259-K267, K269-K277, K279-K287 and K289.

46 **Supplementary Methods 3. Assessment of covariates**

47 Age, sex and race were obtained at baseline. Body mass index (BMI) was calculated as weight divided by height squared (kg/m^2)
48 during the initial Assessment Centre visit. Physical activity was assessed by the International Physical Activity Questionnaire (IPAQ)
49 and metabolic equivalent task (MET) score was calculated using the IPAQ guideline^{2,3}. Smoking status, alcohol intake, regular
50 multivitamin use, regular aspirin use, and regular nonsteroidal anti-inflammatory drugs (NSAID) use were obtained from the
51 Touchscreen questionnaire.

52 The race was classified as white, black, Asian, mixed, or others in UK Biobank. Body mass index (BMI) was classified as <18.5 ,
53 $18.5\text{-}24.9$, $25.0\text{-}29.9$, or ≥ 30.0 kg/m^2 . Physical activity was grouped by trisecting the metabolic equivalent of task hours per week.
54 Smoking status was classified as never, current, or former smoker. Alcohol drinking status was classified as none drinking,
55 moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥ 2 drinks/day for men, and ≥ 1
56 drink/day for women). Regular multivitamin use, regular aspirin use, and regular nonsteroidal antiinflammatory drugs (NSAID) use
57 were classified as use and non-use.

58 **Supplementary Methods 4. Statistical analysis**

59 Subgroup analyses stratified by age (<55 years and ≥55 years), sex (male and female), BMI (<25 kg/m² and ≥ 25 kg/m²), educational
60 level (less than high school education, high school degree, college or university degree), physical activity (grouped by trisecting the
61 metabolic equivalent of task hours per week), smoking status (never/former and current smoker), age at onset of GI disorders (<50
62 years and ≥55 years), Townsend deprivation index (grouped according to trisections) were conducted to test the potential
63 heterogeneity. Subgroup analyses compared the highest with the lowest quartile of dietary pattern scores.

64 To assess the robustness of the results, sensitivity analyses were further performed by removing alcohol component from dietary
65 patterns, removing participants with incidental GI disorders in the previous two years of follow-up to lessen the probability of reverse
66 causation, removing BMI from the covariate list because of its possible mediation effect, or further adjusting for the number of
67 completed dietary surveys.

68 In the analyses of examining the relationships between dietary patterns and incident risk of GI multi-morbidity, we defined the
69 outcomes as developing only one GI disorder, developing two GI disorders, and developing three or over GI disorders. Relative
70 risks (RRs) and 95% CIs were calculated by modified Poisson regression model⁴. The covariate adjustment was consistent with the
71 multivariable Cox regression model. P for trend was calculated by logistic regression models.

72 **Supplementary Table 1. Details of dietary patterns**

Dietary patterns			
AHEI-2010	Higher points assigned to (1) greater intakes of fruits, vegetables, whole grains, nuts and legumes, long chain omega-3 fatty acids, and polyunsaturated fatty acids; (2) lower intakes of red and processed meats, sugar-sweetened beverages and fruit juices, trans fat, sodium; and (3) moderate intake of alcohol ^{5,6} .		
	Scoring method of AHEI-2010 ⁵ : All components were scored from 0 (unhealthy) to 10 (healthiest), and the total score ranged from 0 (non-adherence) to 100 (perfect adherence). The components and criteria for scoring of AHEI-2010 are listed in the following table. Taking vegetables intake as an example, if a participant ate 3 servings of vegetables per day, his score on the entry for vegetables would be 3 divided by 5 (criteria for maximum score) and then multiplied by 10.		
	Component	Criteria for minimum score (0)	Criteria for maximum score (10)
	Vegetables, servings/d	0	≥5
	Fruit, servings/d	0	≥4
	Whole grains, g/d		
	Women	0	75
	Men	0	90
	Sugar-sweetened beverages and fruit juice, servings/d	≥1	0
	Nuts and legumes, servings/d	0	≥1
	Red/processed meat, servings/d	≥1.5	0
	<i>trans</i> Fat, % of energy	≥4	≤0.5
	Long-chain (n-3) fats (EPA + DHA), mg/d	0	250
	PUFA, % of energy	≤2	≥10
	Sodium, mg/d	Highest decile	Lowest decile
	Alcohol, drinks/d		
	Women	≥2.5	0.5–1.5
	Men	≥3.5	0.5–2.0
AMED	Higher points assigned to (1) greater intakes of fruits, vegetables, whole grains, nuts, legumes, fish and seafood, and ratio of monounsaturated to saturated fatty acids; (2) lower intakes of red and processed meats; and (3) moderate intake of alcohol ^{6,7} .		
	Scoring method of AMED: For fruits, vegetables, whole grains, nuts, legumes, fish and seafood, and ratio of monounsaturated to saturated fatty acids, participants with intake above the median intake received 1 point; otherwise they received 0 points. red and processed meats consumption below the median received 1 point. Alcohol intake between 5 and 15 g/d received 1 point.		
DASH	Higher points assigned to (1) greater intakes of fruits, vegetables, whole grains, nuts and legumes, and low-fat dairy; and (2) lower intakes of red and processed meats, sugar-sweetened beverages, and sodium ^{6,8} .		

	Scoring method of DASH: For each of the components, we classified participants into quintiles according to their intake ranking. Component score for fruits, vegetables, nuts and legumes, low-fat dairy products, and whole grains is the participants' quintile ranking. For example, quintile 1 was assigned 1 point and quintile 5, 5 points. For sodium, red and processed meats, and sweetened beverages, low intake was desired. Therefore, the lowest quintile was given a score of 5 points and the highest quintile, 1 point. We then summed up the component scores to obtain an overall ⁸ .
PDIs	Higher points assigned to (1) greater intakes of fruits, vegetables, whole grains, nuts, legumes, tea and coffee, and vegetable oils; (2) lower intakes of meats, eggs, fish and seafood, miscellaneous animal-based foods, dairy, and animal fat; and (3) higher intakes (PDI, unhealthful PDI) or lower intakes (healthful PDI) of potatoes, refined grains, sugar-sweetened beverages, fruit juices, sweets and desserts ^{6,9} . The detailed calculations are as follows:
	Scoring method of PDIs: For PDI, participants received a score of 5 for each plant food group for which they were above the highest quintile of consumption, a score of 4 for each plant food group for which they were above the second highest quintile but below the highest quintile, and so on, with a score of 1 for consumption below the lowest quintile (positive scores). On the other hand, participants received a score of 1 for each animal food group for which they were above the highest quintile of consumption, a score of 2 for each animal food group for which they were between the highest and second highest quintiles, and so on, with a score of 5 for consumption below the lowest quintile (reverse scores). For hPDI, positive scores were given to healthy plant food groups, and reverse scores to less healthy plant food groups and animal food groups. Finally, for uPDI, positive scores were given to less healthy plant food groups, and reverse scores to healthy plant food groups and animal food groups. The 18 food group scores for an individual were summed to obtain the indices ⁹ .
LCDs	Higher points assigned to (1) greater intakes of protein (animal protein for Animal-rich LCD, plant protein for Plant-rich LCD), and fat (animal fat for Animal-rich LCD, plant fat for Plant-rich LCD); and (2) lower intakes of carbohydrate ^{6,10} .
	Scoring method of LCDs: We divided the study participants into 11 strata each of fat, protein, and carbohydrate intake, expressed as a percentage of energy. For fat and protein, participants in the highest stratum received 10 points for that macronutrient, participants in the next stratum received 9 points, and so on down to participants in the lowest stratum, who received 0 points. For carbohydrate, the order of the strata was reversed. The points for each of the three macronutrients were then summed to create the overall diet score. The animal-rich LCD was calculated according to the percentage of energy as carbohydrate, the percentage of energy as animal protein, and the percentage of energy as animal fat. The plant-rich LCD was calculated according to the percentage of energy as carbohydrate, the percentage of energy as vegetable protein, and the percentage of energy as vegetable fat ¹⁰ .

GDQSS	Higher points assigned to (1) greater intakes of cruciferous vegetables, deep orange vegetables, other vegetables, deep orange tubers, citrus fruits, deep orange fruits, other fruits, dark green leafy vegetables, whole grains, legumes, liquid oils, nuts and seeds, poultry and game meat, fish and shellfish, eggs, and low-fat dairy; (2) moderate intakes of high-fat dairy, and red meat; and (3) lower intakes of deep- fried foods, refined grains and baked goods, white roots and tubers, sweets and ice cream, processed meat, sugar-sweetened beverages, and juice ^{6,11} .								
	The GDQS is obtained by summing points across all of the 25 food groups, ranges from 0 to 49. The GDQS+ submetric includes the 16 healthy food groups included in the GDQS, is scored with the same categories of consumed amounts used in the GDQS, and ranges from 0 to 32. The GDQS- submetric includes the 9 GDQS food groups classified as unhealthy or unhealthy in excessive amounts, is scored with the same categories of consumed amounts used in the GDQS, and ranges from 0 to 17 ¹¹ .								
	Scoring method of GDQSS ¹¹ :								
		Categories of consumed amounts (g/d)				Point values			
	Food group	1	2	3	4	1	2	3	4
	Healthy								
	Citrus fruits	<24	24-69	>69		0	1	2	
	Deep orange fruits	<25	25-123	>123		0	1	2	
	Other fruits	<27	27-107	>107		0	1	2	
	Dark green leafy vegetables	<13	13-37	>37		0	2	4	
	Cruciferous vegetables	<13	13-36	>36		0	0.25	0.5	
	Deep orange vegetables	<9	9-45	>45		0	0.25	0.5	
	Other vegetables	<23	23-114	>114		0	0.25	0.5	
	Legumes	<9	9-42	>42		0	2	4	
	Deep orange tubers	<12	12-63	>63		0	0.25	0.5	
	Nuts and seeds	<7	7-13	>13		0	2	4	
	Whole grains	<8	8-13	>13		0	1	2	
	Liquid oils	<2	2-7.5	>7.5		0	1	2	
	Fish and shellfish	<14	14-71	>71		0	1	2	
	Poultry and game meat	<16	16-44	>44		0	1	2	
	Low fat dairy	<33	33-132	>132		0	1	2	
	Eggs	<6	6-32	>32		0	1	2	
	Unhealthy in excessive amounts								
	High fat dairy (in milk equivalent)	<35	35-142	≥142-734	>734	0	1	2	0
	Red meat	<9	9-46	>46		2	1	0	
	Unhealthy								
	Processed meat	<9	9-30	>30		2	1	0	

	Refined grains and baked goods	<7	7-33	>33		2	1	0	
	Sweets and ice cream	<13	13-37	>37		2	1	0	
	Sugar-sweetened beverages	<57	57-180	>180		2	1	0	
	Juice	<36	36-144	>144		2	1	0	
	White roots and tubers	<27	27-107	>107		2	1	0	
	Purchased deep fried foods	<9	9-45	>45		2	1	0	
DII	We used the DII calculation method developed by Shivappa et al ¹² . The DII for this study was computed using data on 31 out of the 45 variables including pro-inflammatory components (vitamin B ₁₂ , carbohydrate, cholesterol, energy, fat, iron, protein, saturated fat, trans fat) and anti-inflammatory components [alcohol, vitamin B ₆ , β-Carotene, fiber, folic acid, garlic, Mg, monounsaturated fat (MUFA), niacin, n-3 fatty acids, n-6 fatty acids, onion, PUFA, riboflavin, Se, thiamin, vitamin A, vitamin C, vitamin E, vitamin D, Zn, pepper].								
	Scoring method of DII: Calculation of the DII is based on dietary intake data that are then linked to the regionally representative world database which provided a robust estimate of a mean and standard deviation for each parameter. First, we subtracted the 'global daily mean intake' from the intake participants reported and divided this value by its standard deviation. To minimize the effect of 'right skewing', this value was converted to a percentile score. Each percentile score was doubled and then '1' was subtracted. The centred percentile value for each food parameter was then multiplied by its respective 'overall food parameter-specific inflammatory effect score' to obtain the 'food parameter-specific DII score'. Finally, all of the 'food parameter-specific DII scores' were summed to create the 'overall DII score' for an individual ¹² . Food parameters included in the dietary inflammatory index, inflammatory effect scores, and intake values from the global composite data set are shown as follows ¹² :								
	Food parameters	Overall inflammatory effect score		Global daily mean intake (units/d)		Standard deviation			
	Alcohol (g)	-0.278		13.98		3.72			
	Vitamin B12 (mg)	0.106		5.15		2.70			
	Vitamin B6 (mg)	-0.365		1.47		0.74			
	β-Carotene (mg)	-0.584		3718		1720			
	Caffeine (g)	-0.110		8.05		6.67			
	Carbohydrate (g)	0.097		272.2		40.0			
	Cholesterol (mg)	0.110		279.4		51.2			
	Energy (kcal)	0.180		2056		338			
	Eugenol (mg)	-0.140		0.01		0.08			
	Total fat (g)	0.298		71.4		19.4			
	Fibre (g)	-0.663		18.8		4.9			
	Folic acid (mg)	-0.190		273.0		70.7			
	Garlic (g)	-0.412		4.35		2.90			
	Ginger (g)	-0.453		59.0		63.2			

	Fe (mg)	0.032	13.35	3.71
	Mg (mg)	-0.484	310.1	139.4
	MUFA (g)	-0.009	27.0	6.1
	Niacin (mg)	-0.246	25.9	11.77
	n-3 Fatty acids (g)	-0.436	1.06	1.06
	n-6 Fatty acids (g)	-0.159	10.80	7.50
	Onion (g)	-0.301	35.9	18.4
	Protein (g)	0.021	79.4	13.9
	PUFA (g)	-0.337	13.88	3.76
	Riboflavin (mg)	-0.068	1.70	0.79
	Saffron (g)	-0.140	0.37	1.78
	Saturated fat (g)	0.373	28.6	8.0
	Se (mg)	-0.191	67.0	25.1
	Thiamin (mg)	-0.098	1.70	0.66
	Trans fat (g)	0.229	3.15	3.75
	Turmeric (mg)	-0.785	533.6	754.3
	Vitamin A (RE)	-0.401	983.9	518.6
	Vitamin C (mg)	-0.424	118.2	43.46
	Vitamin D (mg)	-0.446	6.26	2.21
	Vitamin E (mg)	-0.419	8.73	1.49
	Zn (mg)	-0.313	9.84	2.19
	Green/black tea (g)	-0.536	1.69	1.53
	Flavan-3-ol (mg)	-0.415	95.8	85.9
	Flavones (mg)	-0.616	1.55	0.07
	Flavonols (mg)	-0.467	17.70	6.79
	Flavonones (mg)	-0.250	11.70	3.82
	Anthocyanidins (mg)	-0.131	18.05	21.14
	Isoflavones (mg)	-0.593	1.20	0.20
	Pepper (g)	-0.131	10.00	7.07
	Thyme/oregano (mg)	-0.102	0.33	0.99
	Rosemary (mg)	-0.013	1.00	15.00

73 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; DASH, Dietary Approaches to Stop
74 Hypertension; DII, dietary inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+,
75 positive submetric of Global Diet Quality Score; hPDI, healthful plant-based diet index; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI,
76 unhealthful plant-based diet index.

77 **Supplementary Table 2. Associations between dietary patterns and gastrointestinal disorders risk**

Dietary patterns		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenomas (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
AHEI-2010								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.92 (0.89, 0.95)*	0.94 (0.77, 1.15)	0.90 (0.84, 0.96)*	0.94 (0.87, 1.02)	0.92 (0.81, 1.03)	0.89 (0.85, 0.94)*	0.87 (0.77, 0.99)*
	Quarter 3	0.84 (0.81, 0.88)*	0.80 (0.64, 0.99)*	0.81 (0.76, 0.86)*	0.86 (0.79, 0.94)*	0.93 (0.82, 1.04)	0.84 (0.79, 0.88)*	0.80 (0.70, 0.91)*
	Quarter 4	0.78 (0.75, 0.81)*	0.70 (0.56, 0.88)*	0.76 (0.71, 0.81)*	0.80 (0.73, 0.87)*	0.84 (0.75, 0.95)*	0.78 (0.73, 0.82)*	0.73 (0.63, 0.84)*
Model 2 ^c	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.95 (0.92, 0.99)*	0.97 (0.79, 1.19)	0.95 (0.89, 1.01)	0.99 (0.91, 1.07)	0.92 (0.82, 1.04)	0.92 (0.87, 0.98)*	0.92 (0.80, 1.04)
	Quarter 3	0.90 (0.86, 0.93)*	0.84 (0.68, 1.05)	0.88 (0.82, 0.94)*	0.93 (0.86, 1.02)	0.94 (0.84, 1.06)	0.89 (0.84, 0.94)*	0.86 (0.75, 0.98)*
	Quarter 4	0.86 (0.82, 0.89)*	0.76 (0.60, 0.95)*	0.86 (0.80, 0.92)*	0.90 (0.82, 0.98)*	0.86 (0.77, 0.98)*	0.85 (0.81, 0.90)*	0.80 (0.70, 0.92)*
AMED								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.93 (0.90, 0.96)*	0.96 (0.78, 1.17)	0.95 (0.89, 1.01)	0.97 (0.89, 1.05)	0.96 (0.86, 1.07)	0.90 (0.86, 0.95)*	0.81 (0.71, 0.91)*
	Quarter 3	0.86 (0.82, 0.89)*	0.93 (0.73, 1.18)	0.86 (0.79, 0.92)*	0.90 (0.82, 0.99)*	0.87 (0.76, 1.00)*	0.83 (0.78, 0.89)*	0.74 (0.64, 0.86)*
	Quarter 4	0.78 (0.75, 0.81)*	0.71 (0.56, 0.90)*	0.79 (0.73, 0.85)*	0.83 (0.76, 0.91)*	0.84 (0.74, 0.96)*	0.75 (0.71, 0.79)*	0.71 (0.61, 0.81)*
Model 2 ^c	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.96 (0.92, 0.99)*	0.97 (0.80, 1.19)	0.98 (0.92, 1.05)	1.00 (0.92, 1.08)	0.97 (0.86, 1.08)	0.93 (0.88, 0.98)*	0.84 (0.74, 0.95)*
	Quarter 3	0.90 (0.86, 0.94)*	0.95 (0.75, 1.21)	0.90 (0.84, 0.98)*	0.95 (0.86, 1.05)	0.88 (0.77, 1.01)	0.88 (0.82, 0.93)*	0.78 (0.67, 0.91)*
	Quarter 4	0.85 (0.81, 0.88)*	0.74 (0.58, 0.94)*	0.87 (0.81, 0.93)*	0.92 (0.83, 1.01)	0.86 (0.76, 0.98)*	0.82 (0.77, 0.88)*	0.78 (0.67, 0.90)*
DASH								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.91 (0.88, 0.95)*	0.82 (0.67, 1.02)	0.91 (0.85, 0.97)*	0.94 (0.87, 1.02)	1.01 (0.89, 1.14)	0.91 (0.86, 0.96)*	0.86 (0.75, 0.98)*
	Quarter 3	0.83 (0.80, 0.86)*	0.74 (0.61, 0.91)*	0.80 (0.75, 0.85)*	0.82 (0.76, 0.89)*	0.90 (0.80, 1.01)	0.84 (0.80, 0.89)*	0.75 (0.66, 0.85)*
	Quarter 4	0.76 (0.73, 0.80)*	0.72 (0.57, 0.90)*	0.74 (0.69, 0.80)*	0.75 (0.69, 0.82)*	0.81 (0.71, 0.92)*	0.77 (0.73, 0.82)*	0.67 (0.58, 0.77)*
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.95 (0.92, 0.99)*	0.86 (0.69, 1.06)	0.97 (0.91, 1.03)	1.00 (0.92, 1.09)	1.01 (0.89, 1.14)	0.94 (0.88, 0.99)*	0.90 (0.79, 1.03)

Dietary patterns		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenomas (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	Quarter 3	0.89 (0.86, 0.93)*	0.79 (0.64, 0.97)*	0.89 (0.83, 0.95)*	0.91 (0.84, 0.99)*	0.90 (0.80, 1.01)	0.89 (0.84, 0.94)*	0.82 (0.72, 0.93)*
	Quarter 4	0.85 (0.81, 0.88)*	0.79 (0.62, 0.99)*	0.87 (0.80, 0.93)*	0.88 (0.80, 0.96)*	0.81 (0.72, 0.92)*	0.85 (0.80, 0.90)*	0.75 (0.65, 0.87)*
PDI								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.96 (0.93, 1.00)	0.90 (0.73, 1.11)	0.97 (0.90, 1.03)	0.99 (0.91, 1.08)	0.89 (0.79, 1.01)	0.99 (0.94, 1.05)	0.84 (0.74, 0.96)*
	Quarter 3	0.89 (0.86, 0.92)*	0.87 (0.71, 1.07)	0.88 (0.82, 0.93)*	0.88 (0.81, 0.95)*	0.91 (0.81, 1.02)	0.91 (0.86, 0.96)*	0.77 (0.68, 0.88)*
	Quarter 4	0.86 (0.83, 0.90)*	0.79 (0.63, 0.98)*	0.83 (0.78, 0.89)*	0.79 (0.72, 0.86)*	0.96 (0.85, 1.08)	0.87 (0.83, 0.93)*	0.75 (0.66, 0.86)*
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.99 (0.96, 1.03)	0.92 (0.74, 1.13)	1.02 (0.95, 1.08)	1.05 (0.96, 1.14)	0.89 (0.79, 1.00)*	1.02 (0.96, 1.08)	0.87 (0.77, 1.00)*
	Quarter 3	0.94 (0.90, 0.97)*	0.90 (0.73, 1.11)	0.95 (0.89, 1.01)	0.96 (0.89, 1.04)	0.90 (0.80, 1.01)	0.95 (0.90, 1.00)	0.83 (0.73, 0.95)*
	Quarter 4	0.93 (0.89, 0.97)*	0.82 (0.65, 1.03)	0.94 (0.87, 1.01)	0.90 (0.82, 0.98)*	0.94 (0.84, 1.06)	0.93 (0.88, 0.99)*	0.83 (0.72, 0.95)*
hPDI								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.93 (0.89, 0.96)*	0.86 (0.70, 1.05)	0.92 (0.86, 0.98)*	0.92 (0.85, 1.00)	1.00 (0.89, 1.12)	0.93 (0.88, 0.98)*	0.94 (0.83, 1.08)
	Quarter 3	0.91 (0.87, 0.94)*	0.72 (0.58, 0.90)*	0.89 (0.83, 0.96)*	0.93 (0.85, 1.01)	0.88 (0.78, 0.99)*	0.92 (0.87, 0.97)*	0.94 (0.82, 1.08)
	Quarter 4	0.87 (0.84, 0.91)*	0.77 (0.62, 0.96)*	0.84 (0.79, 0.90)*	0.88 (0.81, 0.96)*	0.90 (0.79, 1.01)	0.90 (0.85, 0.95)*	0.96 (0.84, 1.10)
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.94 (0.91, 0.98)*	0.87 (0.71, 1.07)	0.95 (0.89, 1.01)	0.94 (0.87, 1.02)	1.00 (0.89, 1.12)	0.94 (0.89, 1.00)*	0.95 (0.84, 1.09)
	Quarter 3	0.93 (0.89, 0.97)*	0.74 (0.59, 0.93)*	0.93 (0.87, 1.00)	0.96 (0.88, 1.05)	0.87 (0.77, 0.99)*	0.94 (0.89, 1.00)	0.95 (0.83, 1.10)
	Quarter 4	0.91 (0.87, 0.95)*	0.79 (0.63, 1.00)*	0.90 (0.84, 0.97)*	0.93 (0.85, 1.02)	0.89 (0.78, 1.01)	0.93 (0.88, 0.99)*	0.97 (0.84, 1.12)
uPDI								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	1.03 (0.99, 1.07)	1.08 (0.87, 1.35)	1.01 (0.94, 1.08)	0.91 (0.84, 0.99)*	1.09 (0.97, 1.23)	1.08 (1.02, 1.14)*	0.97 (0.85, 1.11)
	Quarter 3	1.13 (1.09, 1.17)*	1.16 (0.93, 1.46)	1.08 (1.01, 1.16)*	1.03 (0.94, 1.12)	1.16 (1.03, 1.31)*	1.19 (1.12, 1.26)*	1.16 (1.02, 1.34)*
	Quarter 4	1.17 (1.13, 1.22)*	1.33 (1.07, 1.66)*	1.06 (0.99, 1.14)	1.00 (0.92, 1.09)	1.26 (1.12, 1.42)*	1.28 (1.20, 1.35)*	1.25 (1.09, 1.43)*
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)

Dietary patterns		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenomas (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	Quarter 2	1.03 (0.99, 1.07)	1.09 (0.87, 1.36)	1.01 (0.95, 1.08)	0.92 (0.84, 1.00)*	1.08 (0.96, 1.22)	1.06 (1.00, 1.12)*	0.96 (0.84, 1.10)
	Quarter 3	1.11 (1.07, 1.15)*	1.16 (0.92, 1.46)	1.08 (1.01, 1.15)*	1.02 (0.93, 1.11)	1.14 (1.01, 1.29)*	1.15 (1.09, 1.22)*	1.13 (0.98, 1.30)
	Quarter 4	1.14 (1.09, 1.18)*	1.33 (1.06, 1.67)*	1.05 (0.98, 1.13)	0.98 (0.90, 1.08)	1.22 (1.08, 1.38)*	1.21 (1.14, 1.29)*	1.18 (1.03, 1.36)*
LCD								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.98 (0.94, 1.02)	0.96 (0.76, 1.20)	1.03 (0.96, 1.11)	1.03 (0.94, 1.13)	0.89 (0.79, 1.01)	0.95 (0.90, 1.01)	0.96 (0.84, 1.10)
	Quarter 3	0.99 (0.95, 1.03)	1.09 (0.89, 1.35)	1.07 (1.00, 1.14)	1.12 (1.03, 1.22)*	0.88 (0.78, 0.98)*	0.93 (0.89, 0.99)*	0.91 (0.80, 1.04)
	Quarter 4	0.99 (0.96, 1.03)	1.00 (0.80, 1.25)	1.13 (1.06, 1.21)*	1.22 (1.12, 1.33)*	0.90 (0.80, 1.01)	0.91 (0.86, 0.97)*	1.04 (0.91, 1.20)
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.98 (0.94, 1.02)	0.96 (0.77, 1.20)	1.01 (0.94, 1.08)	1.01 (0.92, 1.10)	0.91 (0.81, 1.03)	0.96 (0.90, 1.01)	0.98 (0.85, 1.12)
	Quarter 3	0.97 (0.94, 1.01)	1.09 (0.88, 1.34)	1.02 (0.96, 1.09)	1.07 (0.98, 1.16)	0.90 (0.80, 1.01)	0.93 (0.88, 0.98)*	0.91 (0.80, 1.04)
	Quarter 4	0.95 (0.91, 0.99)*	0.97 (0.78, 1.22)	1.04 (0.97, 1.12)	1.12 (1.02, 1.22)*	0.92 (0.82, 1.04)	0.89 (0.84, 0.94)*	0.99 (0.87, 1.14)
Animal-rich LCD								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.98 (0.95, 1.02)	0.86 (0.70, 1.06)	1.03 (0.96, 1.10)	1.05 (0.96, 1.14)	0.91 (0.81, 1.01)	0.97 (0.92, 1.02)	0.92 (0.80, 1.04)
	Quarter 3	0.99 (0.95, 1.03)	0.89 (0.72, 1.12)	1.09 (1.02, 1.17)*	1.16 (1.06, 1.27)*	0.81 (0.72, 0.92)*	0.93 (0.88, 0.98)*	0.89 (0.77, 1.02)
	Quarter 4	1.01 (0.97, 1.04)	0.93 (0.76, 1.14)	1.11 (1.04, 1.18)*	1.20 (1.10, 1.30)*	0.89 (0.79, 0.99)*	0.95 (0.90, 1.01)	1.01 (0.89, 1.15)
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.97 (0.93, 1.01)	0.90 (0.64, 1.25)	1.00 (0.93, 1.06)	1.02 (0.93, 1.11)	0.92 (0.83, 1.03)	0.96 (0.91, 1.01)	0.92 (0.81, 1.05)
	Quarter 3	0.97 (0.93, 1.01)	0.63 (0.42, 0.95)*	1.03 (0.96, 1.11)	1.10 (1.00, 1.20)*	0.83 (0.73, 0.94)*	0.92 (0.87, 0.97)*	0.89 (0.77, 1.02)
	Quarter 4	0.95 (0.92, 0.99)*	0.63 (0.43, 0.91)*	1.00 (0.94, 1.07)	1.08 (0.99, 1.17)	0.92 (0.82, 1.03)	0.92 (0.87, 0.97)*	0.97 (0.85, 1.10)
Plant-rich LCD								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.94 (0.91, 0.98)*	0.92 (0.62, 1.35)	0.95 (0.89, 1.01)	0.99 (0.91, 1.08)	0.91 (0.81, 1.03)	0.92 (0.87, 0.97)*	0.90 (0.79, 1.03)

Dietary patterns		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenomas (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	Quarter 3	0.94 (0.90, 0.97)*	0.89 (0.61, 1.28)	0.95 (0.89, 1.01)	1.00 (0.92, 1.09)	0.92 (0.82, 1.03)	0.91 (0.86, 0.96)*	0.96 (0.84, 1.09)
	Quarter 4	0.92 (0.89, 0.96)*	1.16 (0.81, 1.65)	1.00 (0.93, 1.07)	1.05 (0.97, 1.14)	0.90 (0.80, 1.01)	0.87 (0.82, 0.91)*	0.93 (0.82, 1.07)
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.95 (0.91, 0.99)*	1.05 (0.84, 1.30)	0.95 (0.89, 1.01)	0.99 (0.91, 1.08)	0.92 (0.82, 1.04)	0.93 (0.88, 0.98)*	0.92 (0.80, 1.06)
	Quarter 3	0.95 (0.91, 0.98)*	0.96 (0.78, 1.19)	0.95 (0.89, 1.01)	1.00 (0.92, 1.09)	0.93 (0.83, 1.04)	0.92 (0.87, 0.97)*	0.97 (0.86, 1.11)
	Quarter 4	0.93 (0.90, 0.97)*	1.03 (0.84, 1.28)	1.00 (0.93, 1.06)	1.05 (0.96, 1.14)	0.90 (0.80, 1.01)	0.89 (0.84, 0.94)*	0.94 (0.82, 1.07)
GDQS								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.93 (0.89, 0.96)*	1.11 (0.90, 1.36)	0.89 (0.83, 0.95)*	0.97 (0.89, 1.06)	0.91 (0.81, 1.03)	0.91 (0.86, 0.97)*	0.87 (0.76, 0.99)*
	Quarter 3	0.89 (0.86, 0.93)*	0.84 (0.67, 1.04)	0.87 (0.81, 0.93)*	0.95 (0.87, 1.03)	0.90 (0.80, 1.01)	0.90 (0.85, 0.95)*	0.77 (0.67, 0.88)*
	Quarter 4	0.83 (0.80, 0.87)*	0.80 (0.64, 1.00)*	0.86 (0.80, 0.92)*	0.91 (0.84, 0.99)*	0.84 (0.75, 0.95)*	0.80 (0.76, 0.85)*	0.81 (0.71, 0.93)*
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.95 (0.92, 0.99)*	1.14 (0.93, 1.40)	0.92 (0.86, 0.98)*	1.00 (0.92, 1.09)	0.93 (0.82, 1.04)	0.94 (0.89, 0.99)*	0.90 (0.79, 1.03)
	Quarter 3	0.93 (0.90, 0.97)*	0.87 (0.70, 1.08)	0.91 (0.85, 0.97)*	1.00 (0.91, 1.08)	0.92 (0.81, 1.03)	0.95 (0.89, 1.00)*	0.81 (0.71, 0.93)*
	Quarter 4	0.89 (0.85, 0.92)*	0.83 (0.66, 1.04)	0.92 (0.86, 0.98)*	0.98 (0.89, 1.06)	0.86 (0.76, 0.97)*	0.86 (0.81, 0.91)*	0.87 (0.76, 0.99)*
GDQS+								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.93 (0.89, 0.96)*	0.91 (0.74, 1.12)	0.94 (0.88, 1.00)	0.98 (0.91, 1.07)	0.86 (0.77, 0.97)*	0.92 (0.87, 0.97)*	0.84 (0.74, 0.96)*
	Quarter 3	0.87 (0.84, 0.91)*	0.81 (0.65, 1.00)*	0.89 (0.83, 0.95)*	0.90 (0.82, 0.98)*	0.89 (0.80, 1.00)	0.85 (0.81, 0.90)*	0.72 (0.63, 0.82)*
	Quarter 4	0.86 (0.83, 0.89)*	0.78 (0.63, 0.97)*	0.90 (0.84, 0.96)*	0.94 (0.87, 1.03)	0.85 (0.76, 0.96)*	0.82 (0.77, 0.87)*	0.83 (0.73, 0.94)*
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.95 (0.92, 0.99)*	0.93 (0.75, 1.14)	0.97 (0.91, 1.04)	1.02 (0.94, 1.11)	0.87 (0.78, 0.98)*	0.94 (0.89, 1.00)*	0.88 (0.78, 1.01)
	Quarter 3	0.91 (0.88, 0.95)*	0.83 (0.67, 1.03)	0.93 (0.87, 1.00)*	0.95 (0.87, 1.04)	0.91 (0.81, 1.02)	0.89 (0.85, 0.95)*	0.77 (0.67, 0.88)*
	Quarter 4	0.90 (0.87, 0.94)*	0.79 (0.64, 0.99)*	0.95 (0.88, 1.01)	1.00 (0.92, 1.10)	0.86 (0.76, 0.97)*	0.87 (0.82, 0.92)*	0.89 (0.78, 1.02)
GDQS-								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)

Dietary patterns		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenomas (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	Quarter 2	0.96 (0.92, 1.00)	1.04 (0.82, 1.31)	0.98 (0.92, 1.06)	0.96 (0.88, 1.06)	0.93 (0.82, 1.06)	0.98 (0.92, 1.04)	0.90 (0.78, 1.04)
	Quarter 3	0.97 (0.93, 1.00)	0.91 (0.75, 1.11)	0.96 (0.91, 1.02)	0.99 (0.91, 1.07)	0.91 (0.82, 1.01)	1.00 (0.95, 1.05)	0.92 (0.82, 1.05)
	Quarter 4	0.95 (0.92, 0.99)*	0.98 (0.80, 1.21)	0.94 (0.88, 1.01)	0.98 (0.91, 1.07)	0.91 (0.81, 1.02)	0.95 (0.90, 1.00)	1.02 (0.90, 1.16)
Model 3 ^d	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.97 (0.93, 1.01)	1.05 (0.83, 1.32)	0.99 (0.92, 1.07)	0.97 (0.88, 1.07)	0.93 (0.82, 1.06)	0.98 (0.93, 1.05)	0.90 (0.77, 1.04)
	Quarter 3	0.98 (0.94, 1.01)	0.93 (0.76, 1.13)	0.98 (0.92, 1.04)	1.00 (0.92, 1.08)	0.92 (0.82, 1.02)	1.01 (0.96, 1.06)	0.92 (0.81, 1.04)
	Quarter 4	0.96 (0.92, 1.00)*	1.00 (0.81, 1.25)	0.96 (0.90, 1.03)	0.99 (0.91, 1.08)	0.92 (0.81, 1.03)	0.96 (0.91, 1.02)	1.00 (0.88, 1.14)
DII								
Model 1 ^b	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	0.99 (0.95, 1.03)	0.87 (0.70, 1.09)	0.97 (0.90, 1.03)	0.94 (0.86, 1.02)	1.03 (0.92, 1.16)	1.01 (0.95, 1.07)	0.99 (0.87, 1.13)
	Quarter 3	1.04 (1.00, 1.08)	1.01 (0.82, 1.25)	1.04 (0.97, 1.11)	0.97 (0.89, 1.06)	0.97 (0.86, 1.10)	1.09 (1.03, 1.15)*	1.01 (0.88, 1.15)
	Quarter 4	1.11 (1.07, 1.16)*	1.02 (0.82, 1.26)	1.05 (0.99, 1.13)	1.02 (0.94, 1.11)	1.11 (0.99, 1.25)	1.19 (1.13, 1.26)*	1.15 (1.00, 1.31)
Model 2 ^c	Quarter 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Quarter 2	1.01 (0.97, 1.05)	0.91 (0.72, 1.13)	1.00 (0.93, 1.07)	0.95 (0.88, 1.04)	1.04 (0.92, 1.17)	1.02 (0.96, 1.08)	1.00 (0.87, 1.15)
	Quarter 3	1.05 (1.01, 1.09)*	1.07 (0.85, 1.34)	1.07 (1.00, 1.15)*	0.98 (0.89, 1.07)	0.98 (0.86, 1.12)	1.09 (1.03, 1.16)*	1.00 (0.86, 1.15)
	Quarter 4	1.12 (1.07, 1.17)*	1.09 (0.85, 1.40)	1.09 (1.01, 1.18)*	1.01 (0.91, 1.11)	1.13 (0.98, 1.29)	1.19 (1.11, 1.27)*	1.09 (0.93, 1.27)

78 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

79 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.

81 ^aHRs (95% CI) are comparing the highest with the lowest quarter. *P* value <0.05 was noted with **.

82 ^bModel 1 was adjusted for age and sex.

83 ^cModel 2 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake.

84 ^dModel 3 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)].

86 **Supplementary Table 3. Associations between dietary patterns and gastrointestinal disorders in sensitivity analyses**

Dietary patterns	Model	HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
Removal of alcohol component from dietary patterns								
AHEI-2010	Model 1 ^b	0.79 (0.76, 0.82) *	0.74 (0.59, 0.93) *	0.79 (0.73, 0.84) *	0.83 (0.76, 0.91) *	0.82 (0.73, 0.92) *	0.78 (0.74, 0.83) *	0.73 (0.64, 0.84) *
	Model 2 ^c	0.86 (0.83, 0.90) *	0.79 (0.63, 0.99) *	0.88 (0.82, 0.95) *	0.94 (0.86, 1.02)	0.83 (0.73, 0.93) *	0.85 (0.80, 0.90) *	0.80 (0.69, 0.92) *
AMED	Model 1 ^b	0.80 (0.76, 0.83) *	0.70 (0.55, 0.90) *	0.81 (0.76, 0.88) *	0.86 (0.78, 0.94) *	0.88 (0.78, 1.00)	0.76 (0.71, 0.81) *	0.74 (0.64, 0.85) *
	Model 2 ^c	0.86 (0.83, 0.90) *	0.74 (0.57, 0.94) *	0.90 (0.83, 0.97) *	0.96 (0.87, 1.05)	0.90 (0.79, 1.03)	0.83 (0.78, 0.89) *	0.81 (0.70, 0.94) *
DII	Model 1 ^b	1.10 (1.06, 1.15) *	1.02 (0.82, 1.26)	1.07 (1.00, 1.15) *	1.04 (0.96, 1.14)	1.08 (0.96, 1.21)	1.17 (1.11, 1.24) *	1.12 (0.98, 1.28)
	Model 3 ^d	1.10 (1.05, 1.15) *	1.07 (0.84, 1.38)	1.10 (1.01, 1.18) *	1.02 (0.92, 1.12)	1.10 (0.96, 1.25)	1.17 (1.09, 1.24) *	1.06 (0.91, 1.24)
Removal of participants with incident gastrointestinal disorders in the previous two years								
AHEI-2010	Model 1 ^b	0.78 (0.75, 0.81) *	0.71 (0.56, 0.90) *	0.76 (0.71, 0.82) *	0.80 (0.73, 0.88) *	0.85 (0.74, 0.97) *	0.78 (0.74, 0.83) *	0.70 (0.60, 0.81) *
	Model 2 ^c	0.91 (0.87, 0.95) *	0.77 (0.61, 0.99) *	0.92 (0.85, 0.99) *	0.99 (0.90, 1.09)	0.87 (0.76, 0.99) *	0.93 (0.87, 0.99) *	0.85 (0.73, 0.99) *
AMED	Model 1 ^b	0.77 (0.74, 0.80) *	0.71 (0.55, 0.92) *	0.78 (0.72, 0.84) *	0.82 (0.75, 0.90) *	0.87 (0.75, 1.00) *	0.74 (0.70, 0.79) *	0.70 (0.60, 0.81) *
	Model 2 ^c	0.88 (0.84, 0.92) *	0.76 (0.59, 0.99) *	0.90 (0.83, 0.97) *	0.96 (0.87, 1.06)	0.89 (0.77, 1.02)	0.86 (0.81, 0.92) *	0.83 (0.71, 0.97) *
DASH	Model 1 ^b	0.77 (0.74, 0.81) *	0.75 (0.59, 0.96) *	0.75 (0.69, 0.80) *	0.75 (0.68, 0.82) *	0.85 (0.74, 0.97) *	0.78 (0.73, 0.83) *	0.66 (0.56, 0.77) *
	Model 3 ^d	0.93 (0.89, 0.97) *	0.84 (0.65, 1.07)	0.95 (0.88, 1.02)	0.99 (0.90, 1.09)	0.85 (0.74, 0.98) *	0.95 (0.89, 1.01)	0.85 (0.73, 0.99) *
PDI	Model 1 ^b	0.86 (0.82, 0.89) *	0.80 (0.63, 1.01)	0.83 (0.77, 0.89) *	0.77 (0.70, 0.85) *	0.96 (0.85, 1.10)	0.88 (0.83, 0.93) *	0.75 (0.65, 0.87) *
	Model 3 ^d	0.98 (0.94, 1.02)	0.85 (0.67, 1.08)	0.98 (0.91, 1.06)	0.95 (0.87, 1.05)	0.95 (0.83, 1.08)	1.00 (0.94, 1.06)	0.91 (0.78, 1.05)
hPDI	Model 1 ^b	0.86 (0.82, 0.90) *	0.80 (0.63, 1.02)	0.85 (0.79, 0.91) *	0.87 (0.80, 0.96) *	0.89 (0.78, 1.02)	0.87 (0.82, 0.93) *	0.91 (0.78, 1.05)
	Model 3 ^d	0.92 (0.88, 0.96) *	0.81 (0.64, 1.04)	0.92 (0.86, 1.00) *	0.96 (0.87, 1.06)	0.88 (0.76, 1.01)	0.94 (0.89, 1.01)	0.95 (0.81, 1.11)
uPDI	Model 1 ^b	1.15 (1.11, 1.20) *	1.24 (0.99, 1.54)	1.02 (0.96, 1.09)	0.97 (0.89, 1.05)	1.28 (1.13, 1.45) *	1.28 (1.21, 1.36) *	1.18 (1.03, 1.36) *
	Model 3 ^d	1.07 (1.02, 1.11) *	1.20 (0.96, 1.50)	0.96 (0.90, 1.03)	0.89 (0.82, 0.98) *	1.24 (1.10, 1.41) *	1.16 (1.09, 1.23) *	1.04 (0.90, 1.19)
LCD	Model 1 ^b	1.01 (0.97, 1.06)	0.99 (0.78, 1.26)	1.15 (1.07, 1.23) *	1.24 (1.13, 1.36) *	0.92 (0.81, 1.05)	0.92 (0.87, 0.98) *	1.09 (0.94, 1.26)
	Model 3 ^d	0.96 (0.92, 1.00)	0.96 (0.76, 1.23)	1.05 (0.98, 1.13)	1.13 (1.03, 1.24) *	0.95 (0.83, 1.08)	0.89 (0.83, 0.94) *	1.03 (0.89, 1.19)
Animal-rich LCD	Model 1 ^b	1.02 (0.98, 1.06)	0.90 (0.73, 1.12)	1.11 (1.04, 1.19) *	1.22 (1.12, 1.33) *	0.90 (0.80, 1.02)	0.96 (0.91, 1.02)	1.04 (0.91, 1.20)
	Model 3 ^d	0.97 (0.93, 1.01)	0.88 (0.70, 1.10)	1.02 (0.95, 1.09)	1.11 (1.01, 1.21) *	0.93 (0.82, 1.06)	0.93 (0.88, 0.98) *	1.00 (0.87, 1.15)

Dietary patterns	Model	HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
Plant-rich LCD	Model 1 ^b	0.92 (0.88, 0.96) *	1.02 (0.82, 1.28)	0.99 (0.93, 1.07)	1.04 (0.95, 1.14)	0.88 (0.78, 1.00)	0.87 (0.82, 0.92) *	0.94 (0.82, 1.08)
	Model 3 ^d	0.92 (0.88, 0.95) *	1.02 (0.82, 1.28)	0.98 (0.92, 1.05)	1.02 (0.94, 1.11)	0.89 (0.78, 1.01)	0.88 (0.83, 0.93) *	0.93 (0.80, 1.07)
GDQS	Model 1 ^b	0.83 (0.80, 0.87) *	0.82 (0.65, 1.04)	0.86 (0.80, 0.92) *	0.92 (0.84, 1.01)	0.85 (0.75, 0.97) *	0.79 (0.75, 0.84) *	0.81 (0.70, 0.93) *
	Model 3 ^d	0.95 (0.91, 0.99) *	0.87 (0.68, 1.10)	0.99 (0.92, 1.06)	1.09 (1.00, 1.19)	0.87 (0.76, 0.99) *	0.93 (0.87, 0.98) *	0.97 (0.84, 1.12)
GDQS+	Model 1 ^b	0.85 (0.82, 0.89) *	0.77 (0.62, 0.97) *	0.89 (0.83, 0.95) *	0.95 (0.87, 1.03)	0.84 (0.74, 0.96) *	0.82 (0.77, 0.87) *	0.84 (0.73, 0.97) *
	Model 3 ^d	0.96 (0.92, 1.00)	0.80 (0.64, 1.02)	1.01 (0.94, 1.08)	1.11 (1.02, 1.22) *	0.85 (0.75, 0.97) *	0.94 (0.89, 1.00) *	1.02 (0.88, 1.17)
GDQS-	Model 1 ^b	0.95 (0.91, 0.99) *	1.01 (0.80, 1.27)	0.96 (0.90, 1.03)	0.98 (0.90, 1.07)	0.91 (0.80, 1.03)	0.95 (0.89, 1.00)	0.98 (0.85, 1.12)
	Model 3 ^d	0.97 (0.93, 1.01)	1.01 (0.80, 1.28)	0.98 (0.91, 1.05)	1.00 (0.91, 1.09)	0.91 (0.80, 1.04)	0.97 (0.91, 1.03)	0.96 (0.83, 1.11)
DII	Model 1 ^b	1.12 (1.07, 1.16) *	1.03 (0.82, 1.29)	1.07 (0.99, 1.14)	1.02 (0.94, 1.12)	1.14 (1.01, 1.30) *	1.18 (1.11, 1.25) *	1.18 (1.02, 1.36) *
	Model 2 ^c	1.04 (1.00, 1.10)	1.03 (0.79, 1.35)	1.03 (0.94, 1.11)	0.92 (0.83, 1.02)	1.16 (1.00, 1.35) *	1.08 (1.01, 1.16) *	1.00 (0.85, 1.18)
Removal of body mass index from the covariate list								
AHEI-2010	Model 2 ^c	0.88 (0.85, 0.92) *	0.75 (0.60, 0.94) *	0.88 (0.83, 0.95) *	0.95 (0.86, 1.03)	0.86 (0.76, 0.97) *	0.88 (0.83, 0.93) *	0.86 (0.74, 0.98) *
AMED	Model 2 ^c	0.85 (0.82, 0.89) *	0.73 (0.57, 0.93) *	0.88 (0.81, 0.94) *	0.94 (0.85, 1.03)	0.86 (0.76, 0.98) *	0.83 (0.78, 0.88) *	0.80 (0.70, 0.93) *
DASH	Model 3 ^d	0.89 (0.85, 0.93) *	0.78 (0.62, 0.98) *	0.91 (0.85, 0.98) *	0.95 (0.87, 1.04)	0.81 (0.71, 0.92) *	0.89 (0.84, 0.94) *	0.83 (0.72, 0.96) *
PDI	Model 3 ^d	0.95 (0.91, 0.99) *	0.81 (0.64, 1.01)	0.96 (0.89, 1.03)	0.93 (0.85, 1.02)	0.94 (0.83, 1.06)	0.95 (0.89, 1.00)	0.87 (0.76, 1.00) *
hPDI	Model 3 ^d	0.91 (0.87, 0.95) *	0.78 (0.62, 0.99) *	0.90 (0.84, 0.97) *	0.94 (0.86, 1.03)	0.88 (0.78, 1.00)	0.93 (0.88, 0.99) *	0.98 (0.85, 1.13)
uPDI	Model 3 ^d	1.08 (1.04, 1.12) *	1.20 (0.97, 1.48)	0.97 (0.91, 1.03)	0.91 (0.83, 0.98) *	1.26 (1.12, 1.41) *	1.19 (1.13, 1.26) *	1.05 (0.92, 1.20)
LCD	Model 3 ^d	0.97 (0.93, 1.00)	0.97 (0.93, 1.00)	1.06 (0.99, 1.14)	1.13 (1.04, 1.24) *	0.92 (0.82, 1.04)	0.91 (0.85, 0.96) *	1.01 (0.88, 1.16)
Animal-rich LCD	Model 3 ^d	0.99 (0.95, 1.03)	0.93 (0.75, 1.14)	1.04 (0.98, 1.11)	1.12 (1.03, 1.22) *	0.91 (0.82, 1.02)	0.96 (0.91, 1.01)	1.01 (0.89, 1.15)
Plant-rich LCD	Model 3 ^d	0.90 (0.87, 0.94) *	1.02 (0.83, 1.26)	0.96 (0.90, 1.03)	1.01 (0.93, 1.10)	0.91 (0.81, 1.02)	0.86 (0.81, 0.90) *	0.90 (0.79, 1.03)
GDQS	Model 3 ^d	0.93 (0.89, 0.97) *	0.83 (0.66, 1.04)	0.96 (0.90, 1.03)	1.05 (0.97, 1.15)	0.86 (0.76, 0.96) *	0.90 (0.85, 0.96) *	0.95 (0.83, 1.08)
GDQS+	Model 3 ^d	0.95 (0.91, 0.99) *	0.79 (0.64, 0.99) *	1.00 (0.93, 1.07)	1.09 (1.00, 1.19) *	0.86 (0.76, 0.96) *	0.92 (0.87, 0.97) *	0.98 (0.85, 1.11)
GDQS-	Model 3 ^d	0.95 (0.92, 0.99) *	1.00 (0.81, 1.24)	0.95 (0.89, 1.02)	0.98 (0.90, 1.07)	0.92 (0.81, 1.03)	0.95 (0.90, 1.01)	1.00 (0.87, 1.14)
DII	Model 2 ^c	1.06 (1.01, 1.10) *	1.09 (0.85, 1.39)	1.03 (0.95, 1.11)	0.93 (0.84, 1.02)	1.13 (0.99, 1.30)	1.12 (1.05, 1.19) *	0.99 (0.85, 1.15)
Further adjusting for the number of completed dietary surveys								

Dietary patterns	Model	HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
AHEI-2010	Model 4 ^e	0.87 (0.83, 0.90) *	0.78 (0.62, 0.98) *	0.86 (0.80, 0.92) *	0.90 (0.82, 0.98) *	0.88 (0.78, 1.00) *	0.87 (0.82, 0.92) *	0.83 (0.72, 0.96) *
AMED	Model 4 ^e	0.86 (0.82, 0.90) *	0.78 (0.60, 1.01)	0.86 (0.79, 0.93) *	0.91 (0.82, 1.01)	0.89 (0.78, 1.03)	0.85 (0.80, 0.91) *	0.83 (0.71, 0.97) *
DASH	Model 5 ^f	0.86 (0.82, 0.90) *	0.82 (0.64, 1.05)	0.86 (0.80, 0.93) *	0.87 (0.79, 0.96) *	0.83 (0.73, 0.95) *	0.87 (0.82, 0.93) *	0.79 (0.68, 0.93) *
PDI	Model 5 ^f	0.96 (0.92, 1.01)	0.88 (0.67, 1.14)	0.94 (0.86, 1.01)	0.88 (0.79, 0.97) *	1.01 (0.88, 1.17)	0.99 (0.93, 1.06)	0.90 (0.77, 1.06)
hPDI	Model 5 ^f	0.87 (0.83, 0.91) *	0.73 (0.57, 0.92) *	0.88 (0.82, 0.95) *	0.92 (0.83, 1.01)	0.84 (0.74, 0.96) *	0.89 (0.83, 0.95) *	0.90 (0.77, 1.04)
uPDI	Model 5 ^f	1.11 (1.06, 1.16) *	1.28 (1.00, 1.65)	1.05 (0.97, 1.13)	0.97 (0.88, 1.07)	1.20 (1.04, 1.37) *	1.19 (1.11, 1.27) *	1.09 (0.93, 1.27)
LCD	Model 5 ^f	0.96 (0.92, 0.99) *	0.99 (0.79, 1.24)	1.04 (0.97, 1.12)	1.12 (1.02, 1.22) *	0.93 (0.82, 1.05)	0.89 (0.84, 0.95) *	1.01 (0.88, 1.16)
Animal-rich LCD	Model 5 ^f	0.96 (0.92, 1.00) *	0.64 (0.44, 0.92) *	1.01 (0.94, 1.08)	1.08 (0.99, 1.17)	0.92 (0.82, 1.03)	0.93 (0.88, 0.98) *	0.98 (0.86, 1.12)
Plant-rich LCD	Model 5 ^f	0.94 (0.90, 0.97) *	1.05 (0.85, 1.30)	1.00 (0.93, 1.06)	1.05 (0.96, 1.14)	0.91 (0.81, 1.02)	0.90 (0.85, 0.95) *	0.95 (0.83, 1.09)
GDQS	Model 5 ^f	0.90 (0.86, 0.93) *	0.85 (0.68, 1.07)	0.92 (0.86, 0.98) *	0.98 (0.90, 1.07)	0.88 (0.78, 0.99) *	0.87 (0.83, 0.93) *	0.90 (0.78, 1.03)
GDQS+	Model 5 ^f	0.92 (0.89, 0.97) *	0.83 (0.65, 1.06)	0.95 (0.88, 1.03)	1.02 (0.92, 1.12)	0.89 (0.78, 1.01)	0.90 (0.84, 0.95) *	0.96 (0.83, 1.11)
GDQS-	Model 5 ^f	0.91 (0.87, 0.95) *	0.92 (0.72, 1.16)	0.94 (0.87, 1.01)	0.97 (0.89, 1.07)	0.85 (0.75, 0.97) *	0.90 (0.85, 0.96) *	0.90 (0.78, 1.04)
DII	Model 4 ^e	1.10 (1.05, 1.15) *	1.06 (0.82, 1.36)	1.09 (1.00, 1.17)	1.00 (0.91, 1.11)	1.11 (0.96, 1.27)	1.17 (1.09, 1.24) *	1.05 (0.90, 1.23)

87 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary
88 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based
89 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.
90 ^aHRs (95% CI) are comparing the highest quarter with the lowest quarter. *P* value <0.05 was noted with '*'.
91 ^bModel 1 was adjusted for age and sex.
92 ^cModel 2 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake.
93 ^dModel 3 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and
94 alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)].
95 ^eModel 4 was adjusted for number of dietary surveys, age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use
96 and total energy intake.
97 ^fModel 5 was adjusted for number of dietary surveys, age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use,
98 total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for

99 women)].

Supplementary Table 4. Baseline characteristics of participants excluded because of missing covariates data and the population with complete 24-hour recall diet data and no certain disease or pregnant at baseline^a

Characteristics	Total population (n=152 538)	Participants excluded (n=11 088)	P value
Age, y, median (IQR)	56 (13)	56 (13)	0.23
Sex, No. (%)			0.06
Female	82278 (53.9)	6084 (54.9)	
Male	70260 (46.1)	5004 (45.1)	
Race, No. (%)			<.001
White	138221 (91.0)	9143 (86.8)	
Multiple	4873 (3.2)	530 (5.0)	
Asian or Asian British	6481 (4.3)	475 (4.5)	
Black	781 (0.5)	118 (1.1)	
Chinese	477 (0.3)	70 (0.7)	
Other ethnic group	1145 (0.8)	192 (1.8)	
BMI, kg/m ² , median (IQR)	26.2 (5.5)	27.5 (6.8)	<.001
Physical activity, METs-h per week, median (IQR)	7.0 (13.5)	6.2 (12.9)	<.001
Alcohol drinking status ^c , No. (%)			<.001
None drinking	12562 (8.3)	1631 (16.0)	
Moderate drinking	84025 (55.4)	5463 (53.5)	
Heavy drinking	55079 (36.3)	3122 (30.6)	
Smoking status, No. (%)			<.001
Never smoker	87898 (57.8)	5698 (53.2)	
Former smoker	52366 (34.4)	3646 (34.1)	
Current smoker	11894 (7.8)	1364 (12.7)	
Regular aspirin use, No. (%)			<.001
No	139389 (92.1)	8991 (90.5)	
Yes	11999 (7.9)	947 (9.5)	
Regular NSAID use, No. (%)			<.001
No	102129 (67.5)	6232 (62.7)	
Yes	49259 (32.5)	3706 (37.3)	
Multivitamin use, No. (%)			<.001
No	103752 (68.2)	7431 (69.8)	
Yes	48349 (31.8)	3220 (30.2)	

Abbreviations: BMI, body mass index; IQR, interquartile range; METs, metabolic equivalent for task score; NSAID, nonsteroidal anti-inflammatory drug; PDI.

^aThe total population in this context refers to people with complete 24-hour recall diet data and excluded those with gastrointestinal disorders, cancer or pregnancy at baseline.

^bAlcohol drinking status was classified as none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women).

109 **Supplementary Table 5. Associations between dietary patterns and gastrointestinal disorders risk after multiple**
 110 **imputation for missing values of covariates (n=152 538)**

Dietary patterns	Model	HR (95% CI) ^a						
		Gastrointestinal disorders (n=22 936)	Inflammatory bowel disease (n=722)	Polyps (n=7 592)	Adenoma (n=4 642)	Irritable bowel syndrome (n=2 478)	Gastroesophageal reflux disease (n=10 979)	Peptic ulcer disease (n=1 936)
AHEI-2010	Model 1 ^b	0.77 (0.74, 0.80) *	0.71 (0.57, 0.88) *	0.75 (0.70, 0.80) *	0.78 (0.71, 0.84) *	0.82 (0.74, 0.92) *	0.77 (0.73, 0.81) *	0.68 (0.60, 0.77) *
	Model 2 ^c	0.84 (0.81, 0.87) *	0.77 (0.62, 0.96) *	0.85 (0.79, 0.90) *	0.88 (0.80, 0.95) *	0.85 (0.75, 0.95) *	0.84 (0.80, 0.89) *	0.75 (0.66, 0.85) *
AMED	Model 1 ^b	0.77 (0.74, 0.80) *	0.72 (0.57, 0.90) *	0.78 (0.73, 0.83) *	0.81 (0.74, 0.88) *	0.82 (0.73, 0.93) *	0.74 (0.70, 0.79) *	0.66 (0.57, 0.75) *
	Model 2 ^c	0.84 (0.80, 0.87) *	0.75 (0.60, 0.95) *	0.86 (0.80, 0.92) *	0.90 (0.82, 0.98) *	0.84 (0.75, 0.95) *	0.82 (0.77, 0.87) *	0.73 (0.64, 0.84) *
DASH	Model 1 ^b	0.76 (0.73, 0.79) *	0.71 (0.57, 0.88) *	0.74 (0.69, 0.79) *	0.75 (0.69, 0.82) *	0.77 (0.68, 0.87) *	0.78 (0.73, 0.82) *	0.64 (0.56, 0.73) *
	Model 3 ^d	0.84 (0.81, 0.88) *	0.77 (0.62, 0.96) *	0.87 (0.81, 0.93) *	0.88 (0.81, 0.96) *	0.77 (0.69, 0.87) *	0.85 (0.80, 0.90) *	0.73 (0.63, 0.83) *
PDI	Model 1 ^b	0.85 (0.82, 0.88) *	0.87 (0.71, 1.06)	0.81 (0.76, 0.87) *	0.80 (0.74, 0.86) *	0.93 (0.84, 1.03)	0.87 (0.82, 0.91) *	0.71 (0.63, 0.81) *
	Model 3 ^d	0.92 (0.88, 0.95) *	0.91 (0.74, 1.11)	0.92 (0.86, 0.98) *	0.91 (0.84, 0.99) *	0.92 (0.82, 1.02)	0.93 (0.88, 0.98) *	0.79 (0.70, 0.90) *
hPDI	Model 1 ^b	0.88 (0.85, 0.91) *	0.78 (0.63, 0.96) *	0.86 (0.80, 0.92) *	0.89 (0.82, 0.97) *	0.88 (0.79, 0.99) *	0.90 (0.85, 0.95) *	0.95 (0.83, 1.08)
	Model 3 ^d	0.91 (0.88, 0.95) *	0.80 (0.64, 1.00)	0.92 (0.86, 0.98) *	0.94 (0.86, 1.02)	0.87 (0.77, 0.98) *	0.93 (0.88, 0.99) *	0.95 (0.83, 1.09)
uPDI	Model 1 ^b	1.19 (1.15, 1.24) *	1.33 (1.08, 1.65) *	1.07 (1.00, 1.14) *	1.03 (0.95, 1.12)	1.30 (1.16, 1.45) *	1.29 (1.22, 1.36) *	1.32 (1.16, 1.50) *
	Model 3 ^d	1.15 (1.11, 1.19) *	1.33 (1.07, 1.66) *	1.06 (0.99, 1.13)	1.01 (0.92, 1.10)	1.26 (1.12, 1.42) *	1.22 (1.16, 1.29) *	1.24 (1.08, 1.41) *
LCD	Model 1 ^b	0.99 (0.96, 1.03)	1.06 (0.86, 1.31)	1.14 (1.07, 1.22) *	1.21 (1.11, 1.32) *	0.92 (0.82, 1.03)	0.91 (0.86, 0.96) *	1.03 (0.91, 1.17)
	Model 3 ^d	0.95 (0.91, 0.99) *	1.03 (0.83, 1.28)	1.04 (0.98, 1.11)	1.11 (1.02, 1.21) *	0.94 (0.84, 1.05)	0.88 (0.84, 0.93) *	0.98 (0.86, 1.11)
Animal-rich LCD	Model 1 ^b	1.01 (0.98, 1.05)	0.96 (0.79, 1.16)	1.13 (1.06, 1.20) *	1.21 (1.11, 1.31) *	0.89 (0.80, 0.99) *	0.95 (0.91, 1.00)	1.02 (0.91, 1.15)
	Model 3 ^d	0.96 (0.93, 1.00) *	0.64 (0.45, 0.91) *	1.02 (0.96, 1.09)	1.09 (1.00, 1.18) *	0.92 (0.83, 1.03)	0.92 (0.87, 0.97) *	0.98 (0.87, 1.10)
Plant-rich LCD	Model 1 ^b	0.92 (0.89, 0.96) *	1.06 (0.87, 1.29)	1.00 (0.94, 1.06)	1.02 (0.94, 1.10)	0.91 (0.82, 1.02)	0.87 (0.82, 0.91) *	0.92 (0.81, 1.04)
	Model 3 ^d	0.93 (0.90, 0.97) *	1.05 (0.86, 1.29)	1.00 (0.94, 1.06)	1.02 (0.94, 1.11)	0.92 (0.82, 1.02)	0.89 (0.84, 0.94) *	0.92 (0.82, 1.05)
GDQS	Model 1 ^b	0.83 (0.80, 0.86) *	0.82 (0.66, 1.02)	0.86 (0.80, 0.91) *	0.90 (0.83, 0.97) *	0.80 (0.72, 0.90) *	0.80 (0.76, 0.84) *	0.77 (0.68, 0.87) *
	Model 3 ^d	0.88 (0.85, 0.91) *	0.85 (0.69, 1.06)	0.92 (0.86, 0.98) *	0.96 (0.89, 1.05)	0.82 (0.74, 0.92) *	0.86 (0.82, 0.91) *	0.83 (0.73, 0.94) *
GDQS+	Model 1 ^b	0.85 (0.82, 0.88) *	0.82 (0.66, 1.01)	0.90 (0.85, 0.96) *	0.92 (0.85, 1.00) *	0.81 (0.73, 0.91) *	0.81 (0.77, 0.86) *	0.79 (0.70, 0.90) *
	Model 3 ^d	0.90 (0.86, 0.93) *	0.83 (0.67, 1.03)	0.96 (0.90, 1.02)	0.99 (0.91, 1.07)	0.82 (0.73, 0.92) *	0.87 (0.82, 0.92) *	0.86 (0.75, 0.97) *
GDQS-	Model 1 ^b	0.97 (0.93, 1.00)	0.98 (0.80, 1.19)	0.96 (0.90, 1.02)	0.99 (0.92, 1.08)	0.94 (0.84, 1.04)	0.97 (0.92, 1.02)	1.04 (0.92, 1.17)

Dietary patterns	Model	HR (95% CI) ^a						
		Gastrointestinal disorders (n=22 936)	Inflammatory bowel disease (n=722)	Polyps (n=7 592)	Adenoma (n=4 642)	Irritable bowel syndrome (n=2 478)	Gastroesophageal reflux disease (n=10 979)	Peptic ulcer disease (n=1 936)
	Model 3 ^d	0.97 (0.94, 1.01)	1.00 (0.82, 1.23)	0.97 (0.91, 1.04)	1.00 (0.92, 1.08)	0.94 (0.84, 1.06)	0.98 (0.93, 1.03)	1.00 (0.89, 1.14)
DII	Model 1 ^b	1.13 (1.09, 1.18) *	1.01 (0.83, 1.24)	1.06 (1.00, 1.13)	1.04 (0.96, 1.12)	1.17 (1.05, 1.31) *	1.22 (1.15, 1.28) *	1.17 (1.03, 1.32) *
	Model 2 ^c	1.13 (1.08, 1.18) *	1.09 (0.85, 1.38)	1.08 (1.01, 1.17) *	1.01 (0.91, 1.11)	1.21 (1.07, 1.38) *	1.20 (1.13, 1.28) *	1.09 (0.94, 1.27)

- 111 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary
- 112 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based
- 113 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.
- 114 ^aHRs (95% CI) are comparing the highest quarter with the lowest quarter. *P* value <0.05 was noted with '*'.
- 115 ^bModel 1 was adjusted for age and sex.
- 116 ^cModel 2 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake.
- 117 ^dModel 3 was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and
- 118 alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)].

119 **Supplementary Table 6.** Associations between food groups and gastrointestinal disorders

Food groups		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
Vegetables	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.96 (0.93, 1.00)*	0.93 (0.77, 1.13)	1.00 (0.94, 1.07)	0.98 (0.91, 1.06)	0.96 (0.86, 1.07)	0.93 (0.88, 0.98)*	0.91 (0.81, 1.03)
	Tertile 3	0.97 (0.93, 1.01)	0.96 (0.77, 1.20)	1.02 (0.95, 1.09)	1.04 (0.96, 1.14)	0.93 (0.83, 1.05)	0.92 (0.87, 0.97)*	0.95 (0.83, 1.09)
Fruits	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.95 (0.92, 0.99)*	0.92 (0.76, 1.12)	0.97 (0.91, 1.03)	0.92 (0.86, 1.00)*	1.00 (0.90, 1.11)	0.94 (0.90, 0.99)*	0.98 (0.87, 1.11)
	Tertile 3	0.92 (0.88, 0.95)*	0.83 (0.67, 1.02)	0.94 (0.88, 1.00)	0.92 (0.85, 1.00)*	0.88 (0.79, 0.99)*	0.89 (0.85, 0.94)*	1.06 (0.93, 1.21)
Whole grains	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.97 (0.93, 1.00)	0.79 (0.65, 0.96)*	0.96 (0.90, 1.02)	0.91 (0.85, 0.99)*	1.04 (0.93, 1.15)	1.00 (0.95, 1.05)	0.99 (0.88, 1.12)
	Tertile 3	0.95 (0.92, 0.99)*	0.89 (0.72, 1.10)	0.90 (0.84, 0.97)*	0.90 (0.82, 0.98)*	1.07 (0.95, 1.21)	0.97 (0.92, 1.03)	0.95 (0.83, 1.09)
Refined grains	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.99 (0.95, 1.02)	0.90 (0.74, 1.10)	0.97 (0.92, 1.03)	0.93 (0.86, 1.00)	1.05 (0.94, 1.16)	1.02 (0.97, 1.07)	0.95 (0.84, 1.07)
	Tertile 3	1.02 (0.98, 1.05)	1.10 (0.90, 1.34)	0.99 (0.93, 1.05)	0.96 (0.89, 1.04)	1.05 (0.94, 1.17)	1.06 (1.01, 1.12)*	0.97 (0.86, 1.11)
Nuts and	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)

Food groups		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
legumes	1							
	Tertile 2	0.99 (0.96, 1.02)	0.94 (0.78, 1.13)	0.96 (0.91, 1.02)	1.08 (1.00, 1.17)*	0.94 (0.85, 1.04)	1.00 (0.95, 1.05)	0.99 (0.88, 1.11)
	Tertile 3	0.97 (0.93, 1.00)	0.88 (0.71, 1.09)	1.01 (0.94, 1.07)	1.07 (0.98, 1.16)	0.93 (0.83, 1.04)	0.96 (0.91, 1.01)	0.91 (0.80, 1.04)
Red meat	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.00 (0.94, 1.06)	1.01 (0.72, 1.42)	1.01 (0.91, 1.12)	1.02 (0.89, 1.17)	0.77 (0.63, 0.94)*	1.00 (0.92, 1.09)	1.15 (0.94, 1.41)
	Tertile 3	0.99 (0.96, 1.02)	1.02 (0.86, 1.20)	1.02 (0.97, 1.08)	1.05 (0.99, 1.12)	0.92 (0.84, 1.00)	0.98 (0.94, 1.02)	0.93 (0.84, 1.03)
Processed meat	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.98 (0.94, 1.02)	0.80 (0.63, 1.00)	1.01 (0.94, 1.08)	1.04 (0.96, 1.14)	0.96 (0.85, 1.08)	0.98 (0.92, 1.03)	0.96 (0.84, 1.11)
	Tertile 3	1.02 (0.98, 1.05)	0.93 (0.77, 1.11)	1.06 (1.00, 1.12)*	1.03 (0.96, 1.11)	1.06 (0.96, 1.18)	0.97 (0.92, 1.02)	1.12 (1.00, 1.26)*
Poultry	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.02 (0.97, 1.08)	0.97 (0.72, 1.31)	1.09 (1.00, 1.20)*	1.02 (0.91, 1.15)	0.91 (0.78, 1.08)	1.10 (1.02, 1.18)*	0.92 (0.76, 1.11)
	Tertile 3	1.01 (0.98, 1.04)	1.03 (0.87, 1.22)	1.03 (0.97, 1.08)	1.05 (0.99, 1.13)	1.04 (0.95, 1.14)	1.01 (0.97, 1.06)	0.95 (0.85, 1.06)
Fish and seafood	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile	0.95 (0.89, 1.01)	1.08 (0.77, 1.50)	0.93 (0.83, 1.04)	1.10 (0.96, 1.26)	0.79 (0.64, 0.96)*	0.90 (0.82, 0.99)*	0.91 (0.72, 1.14)

Food groups		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	2							
	Tertile 3	0.96 (0.93, 0.99)*	0.93 (0.79, 1.10)	0.96 (0.92, 1.01)	1.03 (0.96, 1.10)	0.93 (0.85, 1.02)	0.93 (0.89, 0.97)*	0.91 (0.82, 1.01)
Eggs	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.97 (0.88, 1.06)	1.15 (0.71, 1.88)	0.87 (0.73, 1.03)	0.91 (0.74, 1.13)	1.07 (0.83, 1.38)	1.01 (0.88, 1.15)	0.83 (0.58, 1.17)
	Tertile 3	1.02 (0.99, 1.05)	1.15 (0.98, 1.36)	1.00 (0.95, 1.06)	1.05 (0.98, 1.12)	1.00 (0.91, 1.10)	1.01 (0.96, 1.05)	0.96 (0.86, 1.06)
Low-fat dairy	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.02 (0.99, 1.06)	1.10 (0.91, 1.34)	1.02 (0.96, 1.09)	0.93 (0.87, 1.01)	0.89 (0.80, 0.99)*	1.06 (1.01, 1.12)*	0.93 (0.82, 1.05)
	Tertile 3	1.01 (0.98, 1.05)	1.10 (0.90, 1.35)	0.99 (0.93, 1.05)	0.93 (0.86, 1.01)	0.87 (0.78, 0.97)*	1.08 (1.02, 1.13)*	0.93 (0.82, 1.06)
High-fat dairy	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.95 (0.91, 0.98)*	1.12 (0.91, 1.38)	1.01 (0.94, 1.07)	0.91 (0.84, 0.99)*	0.94 (0.84, 1.05)	0.92 (0.87, 0.97)*	0.90 (0.79, 1.02)
	Tertile 3	0.92 (0.89, 0.95)*	1.11 (0.93, 1.34)	0.99 (0.93, 1.04)	0.92 (0.86, 0.99)*	0.81 (0.73, 0.90)*	0.88 (0.84, 0.92)*	0.89 (0.80, 1.00)*
Potatoes	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.02 (0.99, 1.06)	1.01 (0.83, 1.22)	0.99 (0.93, 1.05)	0.98 (0.91, 1.06)	1.12 (1.00, 1.24)*	1.01 (0.96, 1.07)	0.98 (0.86, 1.11)
	Tertile 3	1.06 (1.01, 1.11)*	1.01 (0.78, 1.31)	0.97 (0.89, 1.05)	1.06 (0.96, 1.17)	1.21 (1.05, 1.39)*	1.05 (0.99, 1.13)	1.12 (0.96, 1.32)

Food groups		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	3							
Purchased deep fried foods	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.00 (0.91, 1.10)	0.74 (0.39, 1.38)	0.97 (0.81, 1.15)	1.06 (0.86, 1.31)	1.15 (0.88, 1.49)	1.01 (0.88, 1.16)	1.04 (0.74, 1.45)
	Tertile 3	1.03 (0.99, 1.06)	1.03 (0.85, 1.24)	1.06 (1.00, 1.13)*	1.01 (0.93, 1.08)	0.90 (0.81, 1.00)*	1.05 (1.00, 1.10)	0.98 (0.87, 1.10)
Sweets and desserts	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.02 (0.98, 1.05)	1.05 (0.87, 1.27)	1.01 (0.95, 1.07)	0.94 (0.87, 1.01)	1.07 (0.96, 1.19)	1.03 (0.98, 1.09)	0.92 (0.82, 1.03)
	Tertile 3	1.02 (0.98, 1.06)	1.01 (0.82, 1.24)	1.01 (0.94, 1.07)	0.89 (0.82, 0.96)*	1.15 (1.03, 1.29)*	1.06 (1.01, 1.12)*	0.94 (0.82, 1.06)
Sugar-sweetened beverages	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	1.07 (1.01, 1.13)*	1.12 (0.82, 1.53)	1.08 (0.98, 1.19)	1.08 (0.96, 1.22)	1.09 (0.91, 1.30)	1.07 (0.98, 1.16)	0.96 (0.78, 1.18)
	Tertile 3	1.07 (1.04, 1.10)*	1.13 (0.96, 1.33)	1.03 (0.98, 1.08)	1.00 (0.93, 1.06)	1.11 (1.02, 1.22)*	1.09 (1.05, 1.14)*	1.08 (0.97, 1.19)
Juice	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.97 (0.94, 1.01)	1.15 (0.93, 1.42)	0.97 (0.90, 1.04)	0.97 (0.89, 1.06)	0.97 (0.86, 1.09)	0.91 (0.86, 0.97)*	0.98 (0.85, 1.12)
	Tertile 3	0.96 (0.93, 0.99)*	1.00 (0.84, 1.20)	1.00 (0.95, 1.05)	0.94 (0.87, 1.00)	0.98 (0.89, 1.08)	0.94 (0.90, 0.98)*	0.95 (0.85, 1.06)
Tea and coffee	Tertile	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)

Food groups		HR (95% CI) ^a						
		Gastrointestinal disorders (n=20858)	Inflammatory bowel disease (n=666)	Polyps (n=6910)	Adenoma (n=4254)	Irritable bowel syndrome (n=2232)	Gastroesophageal reflux disease (n=9942)	Peptic ulcer disease (n=1713)
	1							
	Tertile 2	1.00 (0.96, 1.03)	0.85 (0.69, 1.04)	1.00 (0.94, 1.06)	1.01 (0.93, 1.09)	1.00 (0.90, 1.12)	1.04 (0.99, 1.09)	0.88 (0.78, 0.99)*
	Tertile 3	0.98 (0.95, 1.02)	0.89 (0.73, 1.07)	0.98 (0.92, 1.04)	0.98 (0.91, 1.06)	1.01 (0.91, 1.12)	1.02 (0.97, 1.08)	0.89 (0.79, 1.01)
Fruits and whole grains	Tertile 1	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Tertile 2	0.95 (0.92, 0.99)*	0.86 (0.71, 1.04)	0.95 (0.89, 1.01)	0.91 (0.85, 0.98)*	0.97 (0.87, 1.07)	0.96 (0.92, 1.01)	1.02 (0.90, 1.15)
	Tertile 3	0.89 (0.86, 0.93)*	0.81 (0.65, 1.00)	0.87 (0.81, 0.93)*	0.85 (0.78, 0.93)*	0.91 (0.81, 1.03)	0.89 (0.84, 0.94)*	1.01 (0.88, 1.16)

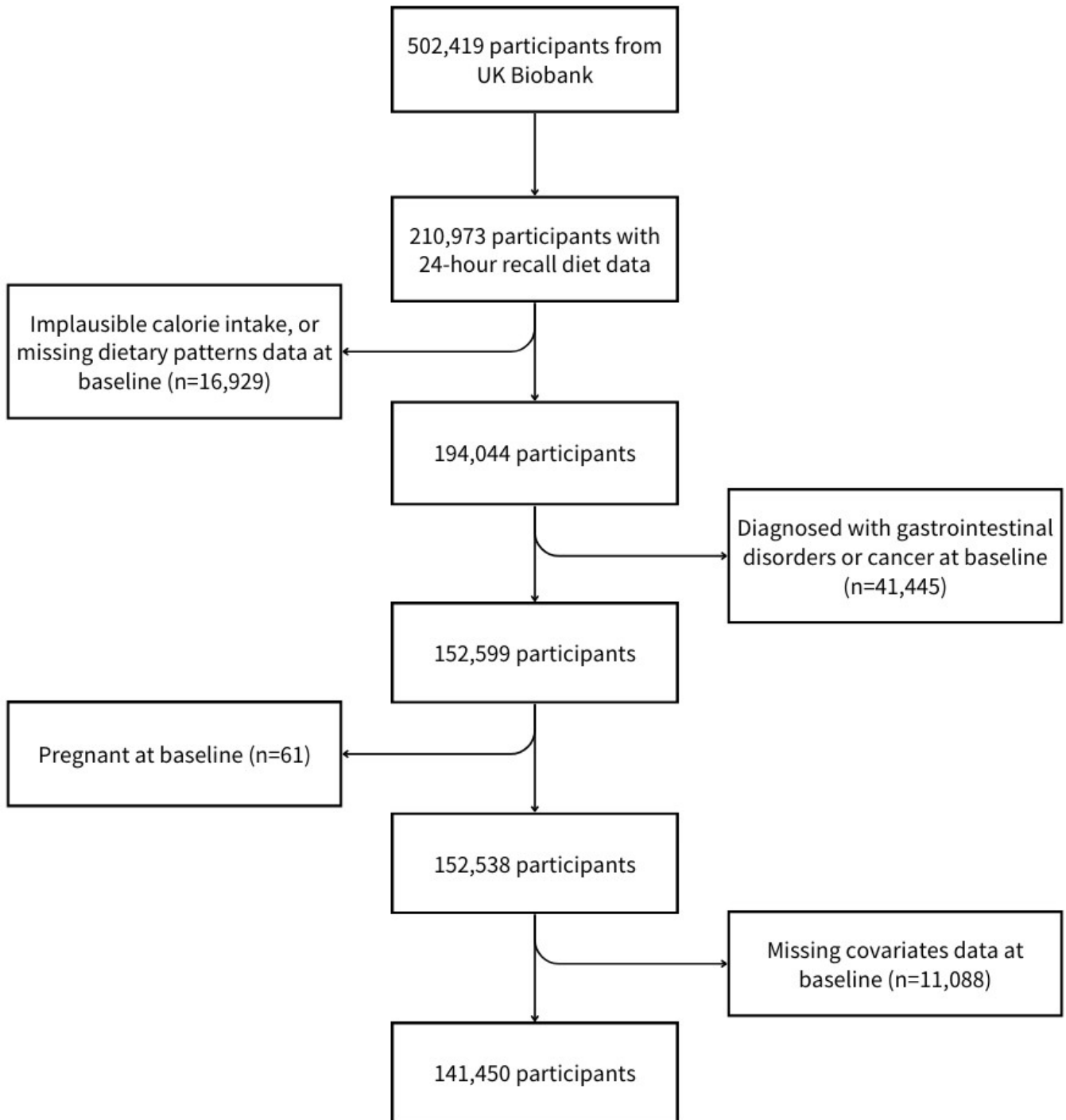
120 Abbreviations: CI, confidence interval; HR, hazard ratio.

121 ^aHRs (95% CI) are comparing the highest with the lowest tertiles. *P* value <0.05 was noted with '*'.

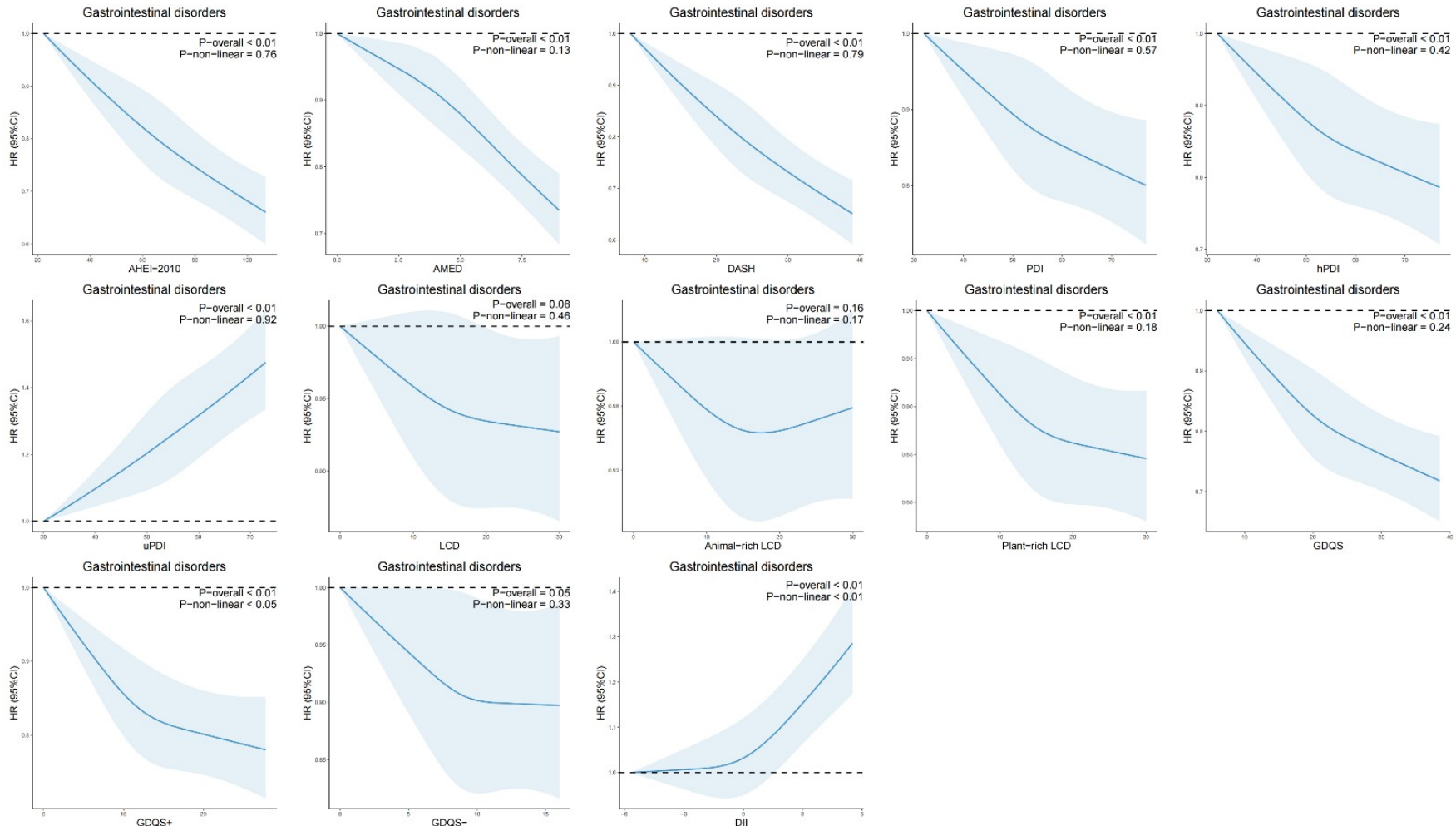
122 The model for food group was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use, total

123 energy intake, alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)]

124 and intakes of other food groups.

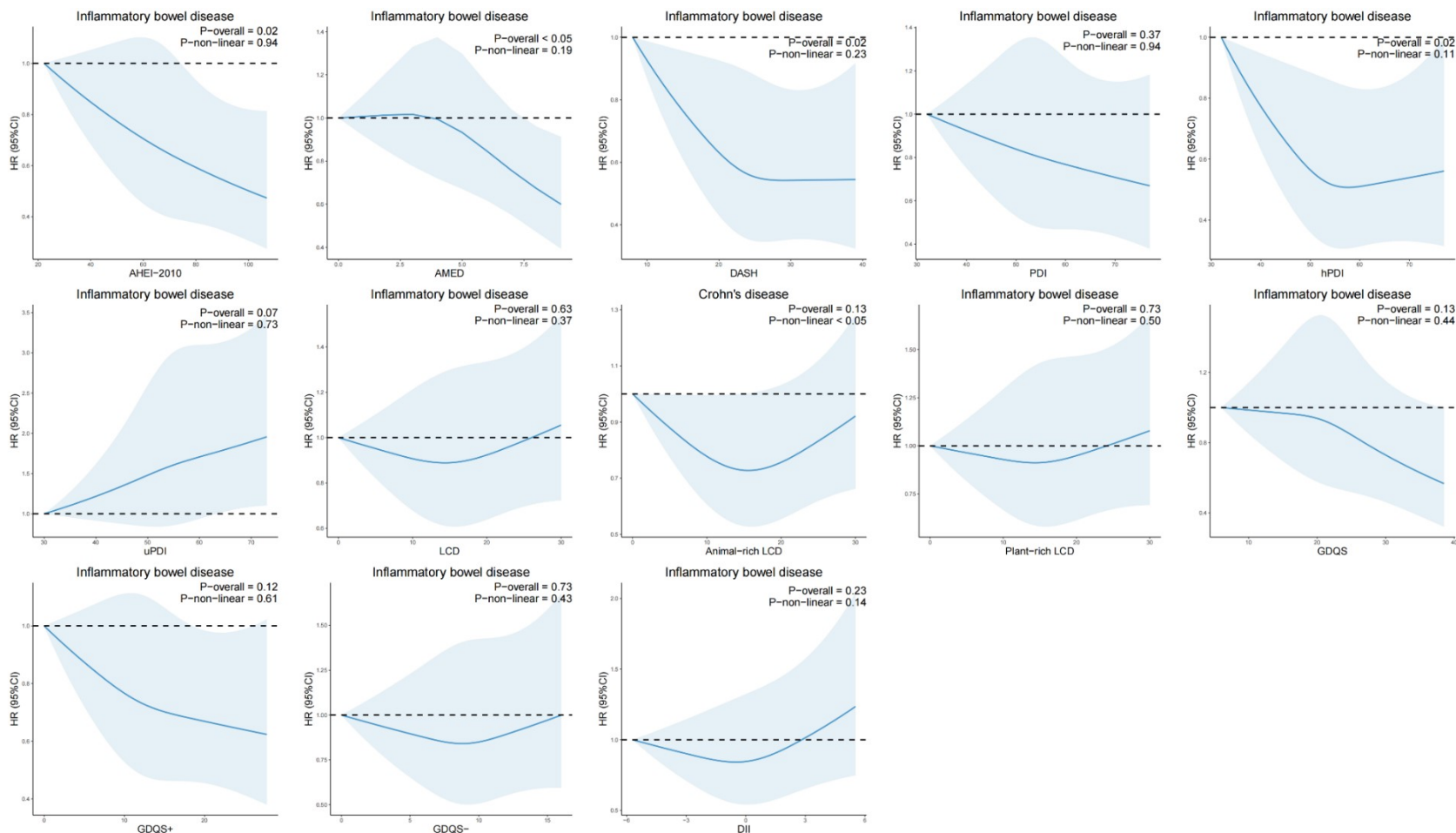


125
126 **Supplementary Figure 1. Flowchart of participants included in the analyses.**



127

128 **Supplementary Figure 2. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of gastrointestinal disorders.** Models for AHEI-2010, AMED and DII were
 129 adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for
 130 DASH, PDI, hPDI, uPDI, LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical
 131 activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for
 132 women), or heavy drinking (≥ 2 drinks/day for men, and ≥ 1 drink/day for women)].
 133 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary
 134 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based
 135 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



136

137 **Supplementary Figure 3. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of inflammatory bowel disease.** Models for AHEI-2010, AMED and DII were

138 adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for

139 DASH, PDI, hPDI, uPDI, LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical

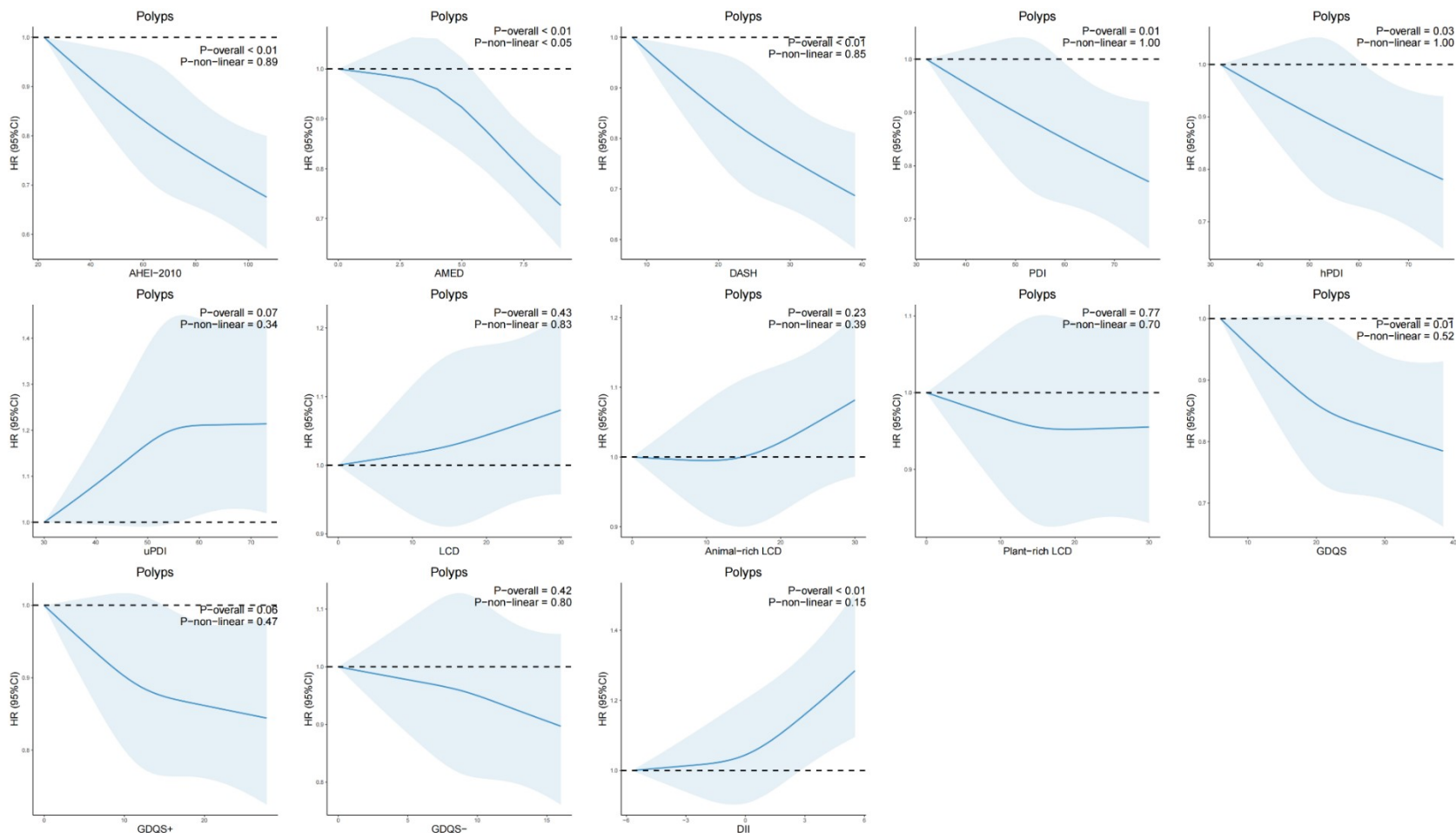
140 activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for

141 women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)].

142 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

143 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based

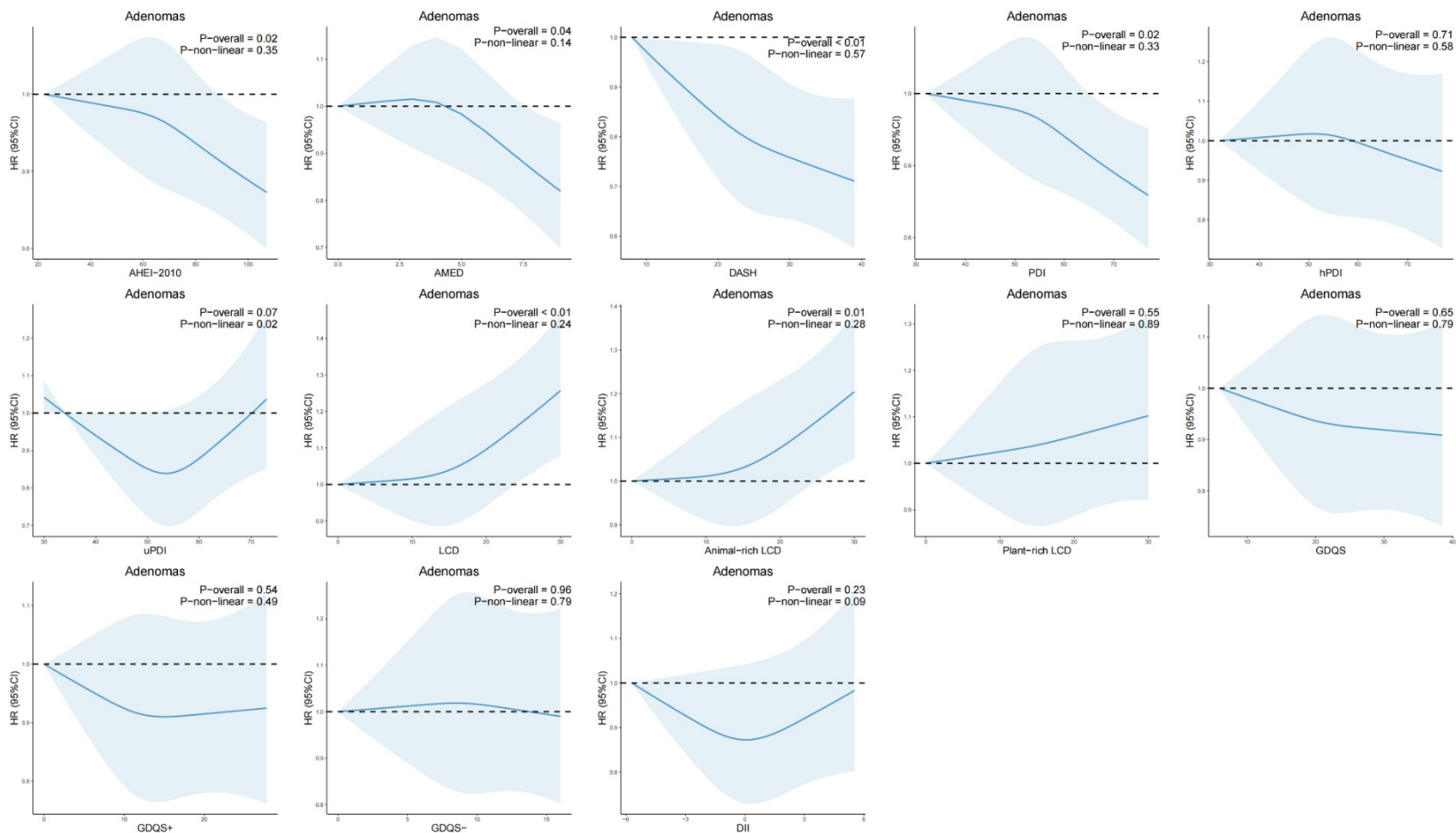
144 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



145

146 **Supplementary Figure 4. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of polyps.** Models for AHEI-2010, AMED and DII were adjusted for age, sex,
 147 BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for DASH, PDI, hPDI, uPDI,
 148 LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use,
 149 regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2
 150 drinks/day for men, and ≥1 drink/day for women)].

151 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary
 152 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based
 153 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



154

155 **Supplementary Figure 5. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of adenomas.** Models for AHEI-2010, AMED and DII were adjusted for age, sex,

156 BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for DASH, PDI, hPDI, uPDI,

157 LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use,

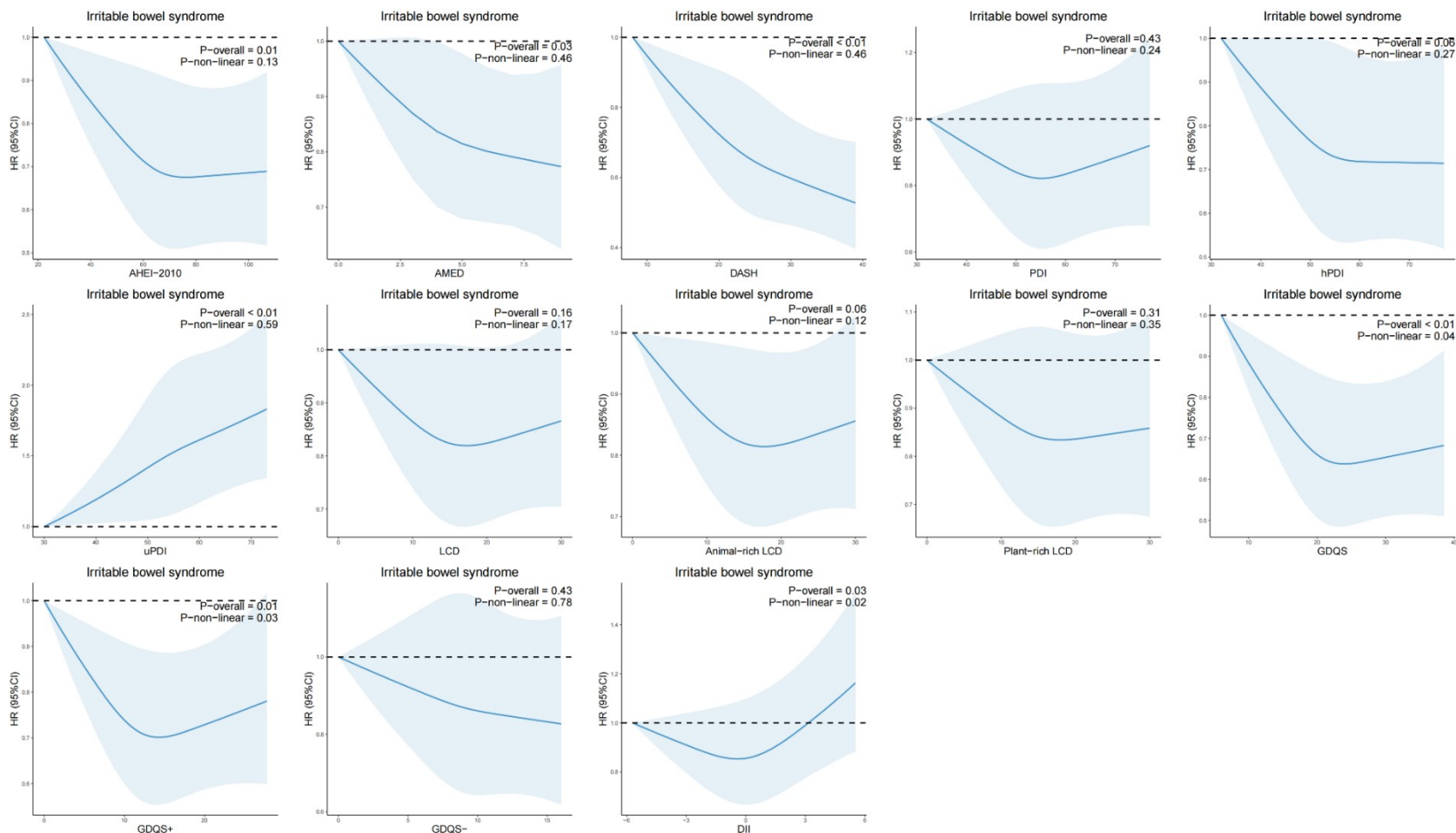
158 regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2

159 drinks/day for men, and ≥1 drink/day for women)].

160 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

161 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based

162 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



163

164 **Supplementary Figure 6. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of irritable bowel syndrome.** Models for AHEI-2010, AMED and DII were

165 adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for

166 DASH, PDI, hPDI, uPDI, LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical

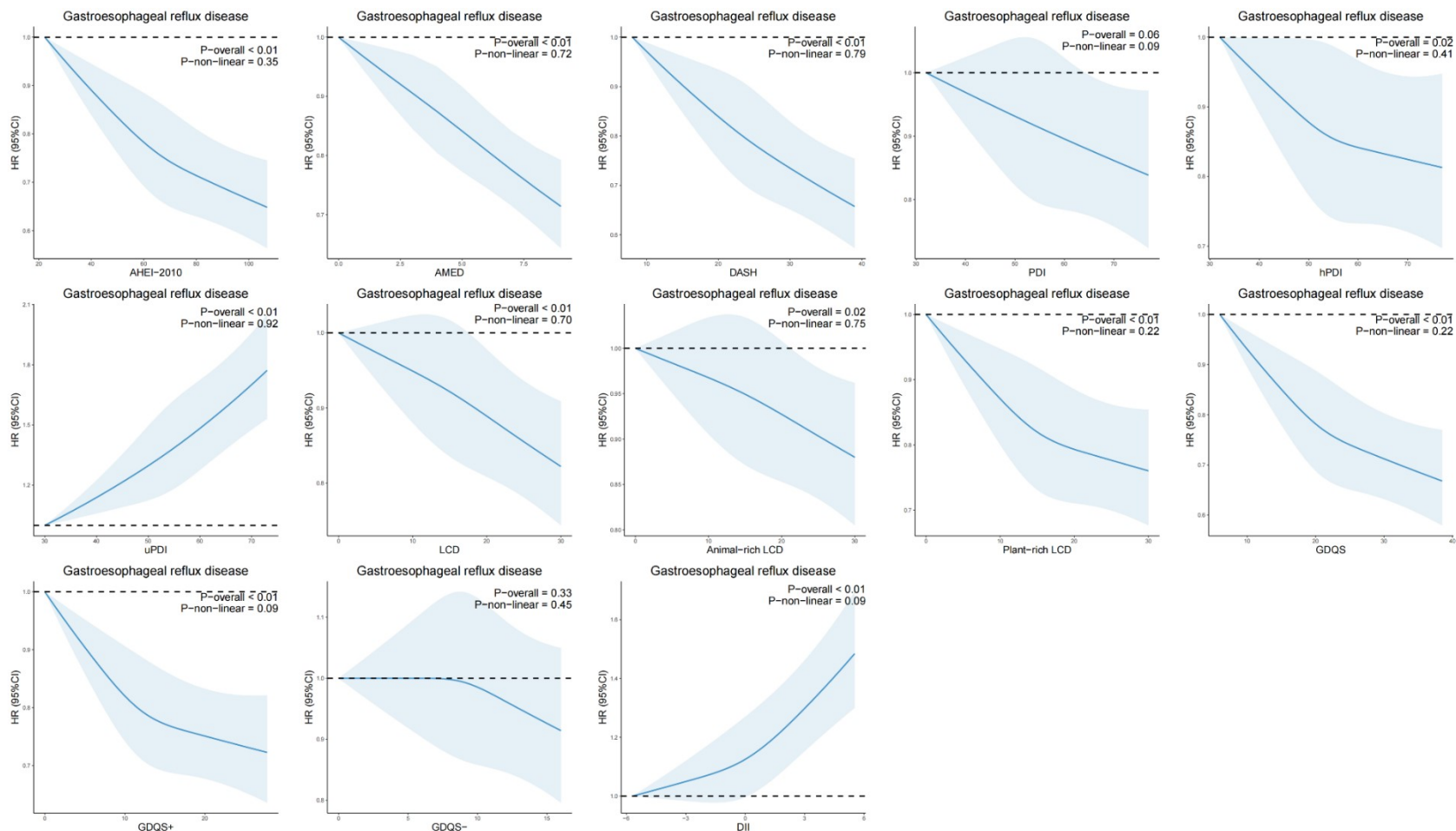
167 activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for

168 women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)].

169 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

170 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based

171 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



172

173 **Supplementary Figure 7. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of gastroesophageal reflux disease.** Models for AHEI-2010, AMED and DII

174 were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models

175 for DASH, PDI, hPDI, uPDI, LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical

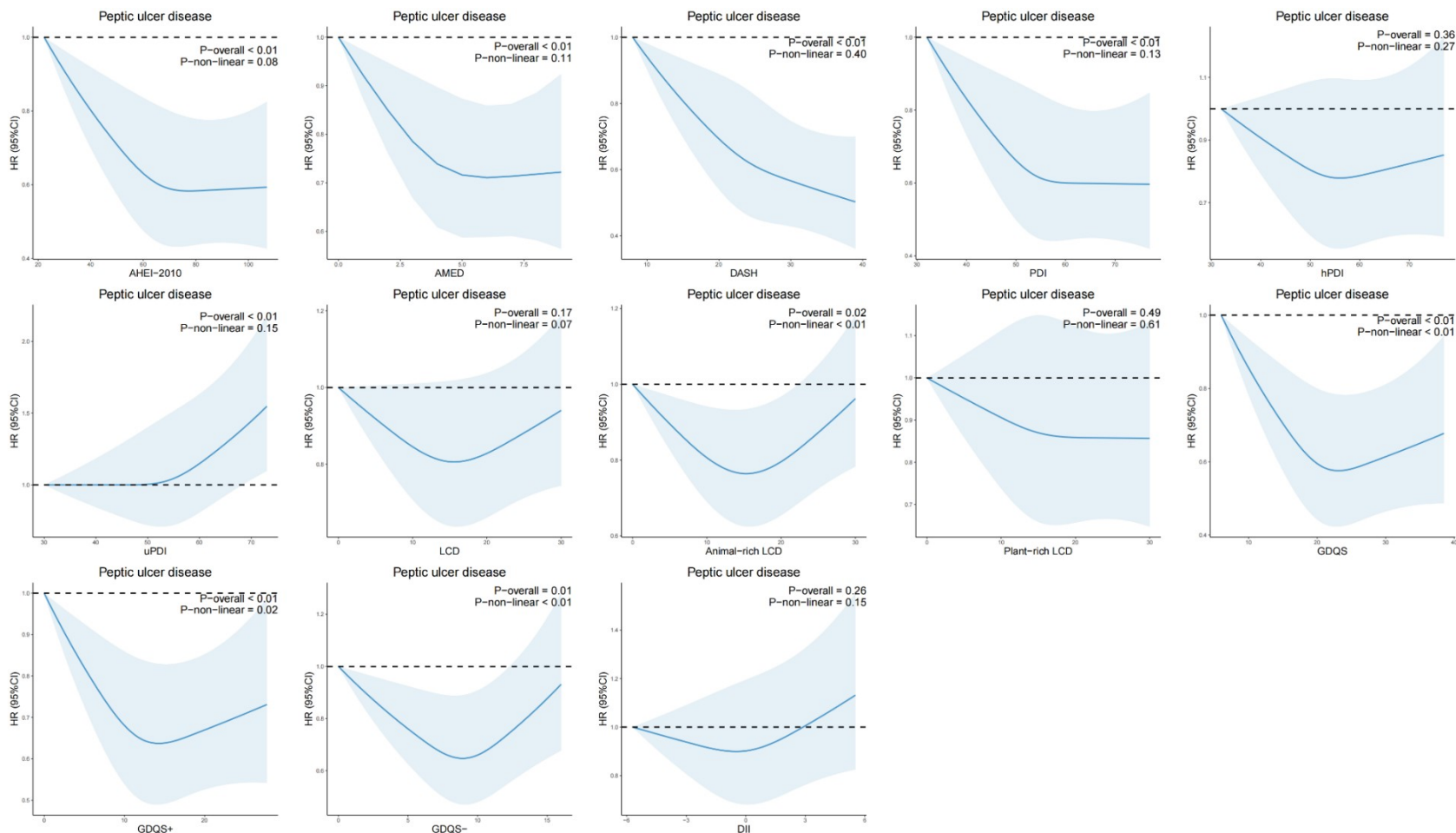
176 activity, multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for

177 women), or heavy drinking (≥ 2 drinks/day for men, and ≥ 1 drink/day for women)].

178 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

179 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based

180 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.



181

182 **Supplementary Figure 8. Multivariable-adjusted cubic spline analysis of dietary pattern scores with the risk of peptic ulcer disease.** Models for AHEI-2010, AMED and DII were adjusted

183 for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for DASH, PDI,

184 hPDI, uPDI, LCD, animal-rich LCD, plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity,

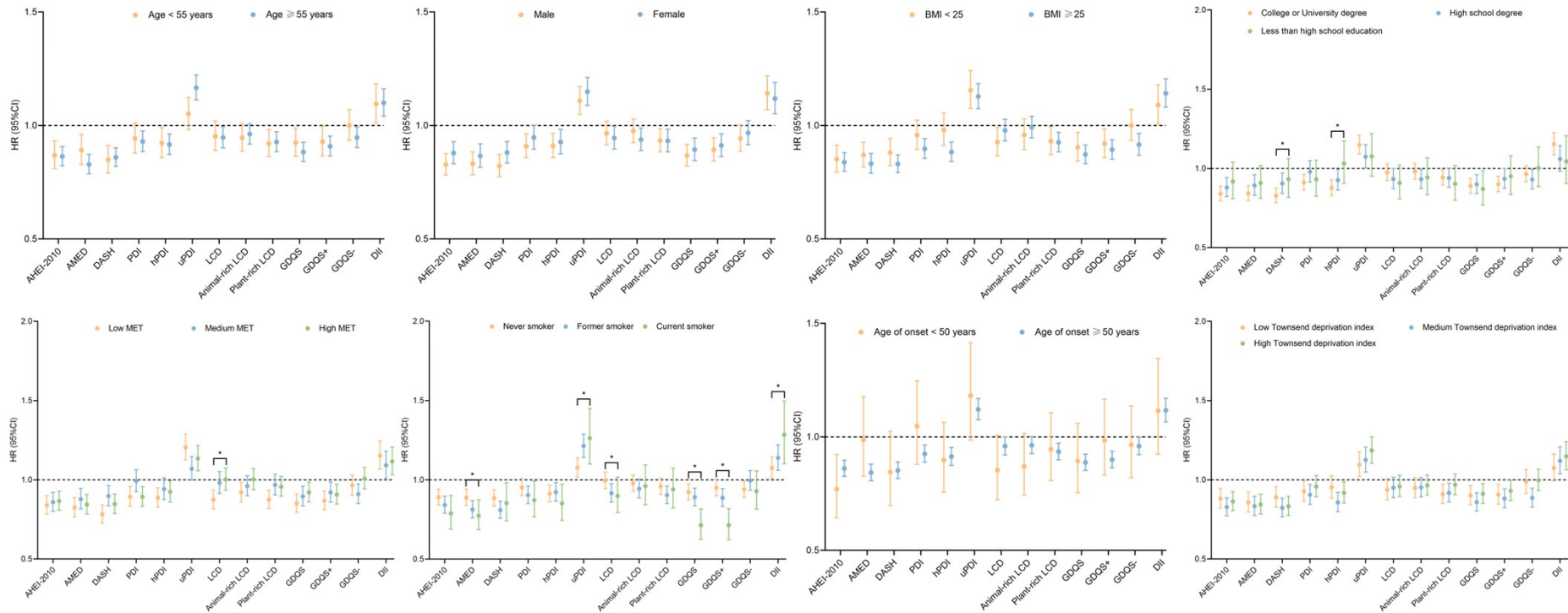
185 multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or

186 heavy drinking (≥ 2 drinks/day for men, and ≥ 1 drink/day for women)].

187 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; DASH, Dietary Approaches to Stop Hypertension; DII, dietary

188 inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score; hPDI, healthful plant-based

189 diet index; HR, hazard ratio; LCD, low carbohydrate diet; PDI, plant-based diet index; uPDI, unhealthful plant-based diet index.

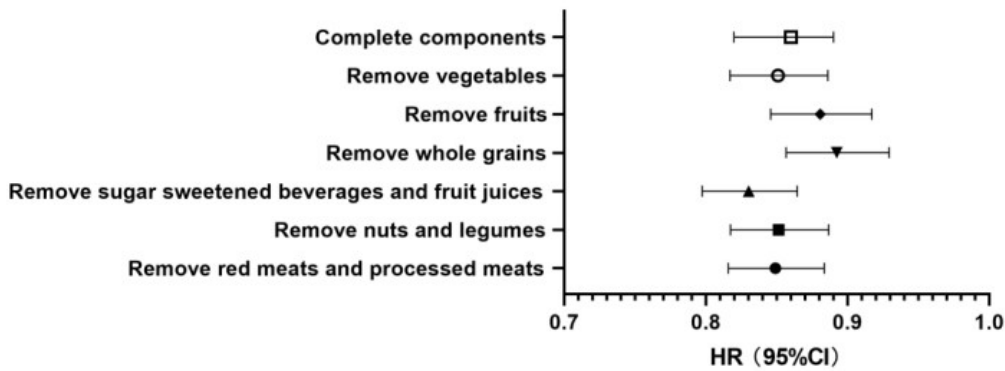


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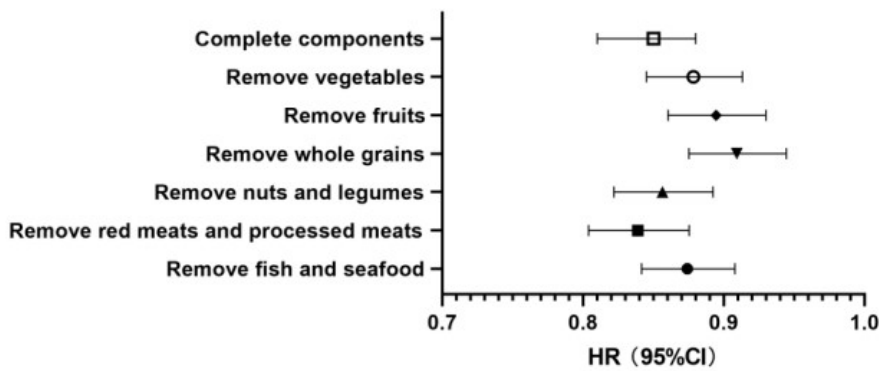
191 **Supplementary Figure 9. The associations between dietary patterns and gastrointestinal disorders in subgroups.** The HRs (95% CIs) were calculated by comparing the highest with the
 192 lowest quarter. The HRs are indicated by the circles and the 95% CIs are reflected by the error bars. The models for AHEI-2010, AMED and DII were adjusted for age, sex, BMI, race, cardiovascular
 193 disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total energy intake. Models for DASH, PDI, hPDI, uPDI, LCD, animal-rich LCD,
 194 plant-rich LCD, GDQS, GDQS+ and GDQS- were adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular
 195 NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1
 196 drink/day for women)]. *P* for trend <0.05 was noted with '*'. Low MET: lowest tertile of MET; medium MET: medium tertile of MET; high MET: highest tertile of MET. Low Townsend deprivation index:
 197 lowest tertile of Townsend deprivation index; medium Townsend deprivation index: medium tertile of Townsend deprivation index; high Townsend deprivation index: highest tertile of Townsend
 198 deprivation index.

199 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; BMI, body mass index; CI, confidence interval; DASH, Dietary Approaches to Stop
 200 Hypertension; DII, dietary inflammatory index; GDQS, Global Diet Quality Score; GDQS-, negative submetric of Global Diet Quality Score; GDQS+, positive submetric of Global Diet Quality Score;
 201 hPDI, healthful plant-based diet index; HR, hazard ratio; LCD, low carbohydrate diet; MET, metabolic equivalent; PDI, plant-based diet index; uPDI, unhealthy plant-based diet index.

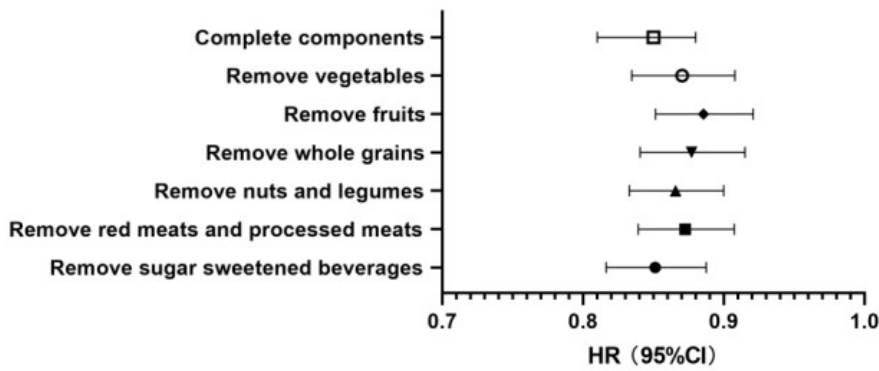
AHEI-2010



AMED



DASH



202
 203 **Supplementary Figure 10. Associations of AHEI-2010, AMED and DASH with gastrointestinal disorders after removing food group**
 204 **components.** The HRs (95% CIs) were calculated by comparing the highest quarter with the lowest quarter. The HRs are indicated by rectangles,
 205 circles or triangles. The 95% CIs are reflected by the error bars. The model for AHEI-2010 and AMED of complete components was adjusted for age,
 206 sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity, multivitamin use, regular aspirin use, regular NSAID use and total
 207 energy intake. The models for AHEI-2010 and AMED of removing components were further adjusted for the intake of the removing component. The
 208 model for DASH of complete components was adjusted for age, sex, BMI, race, cardiovascular disease, diabetes, smoking status, physical activity,
 209 multivitamin use, regular aspirin use, regular NSAID use, total energy intake and alcohol drinking status [none drinking, moderate drinking (<2
 210 drinks/day for men, and <1 drink/day for women), or heavy drinking (≥2 drinks/day for men, and ≥1 drink/day for women)]. The models for DASH of
 211 removing components were further adjusted for the intake of the removing component.

212 Abbreviations: AHEI-2010, Alternate Healthy Eating Index-2010; AMED, Alternate Mediterranean Diet; CI, confidence interval; HR, hazard ratio.

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