

Figure S1 Association between current asthma and α -carotene intakes. The red line and blue line represent the estimated values and their corresponding 95% confidence interval. All adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; BMI-Z scores, body mass index standard deviation scores.

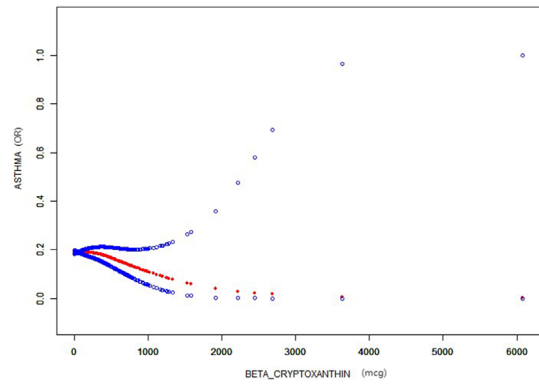


Figure S3 Association between current asthma and β -cryptoxanthin intakes. The red line and blue line represent the estimated values and their corresponding 95% confidence interval. All adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; BMI-Z scores, body mass index standard deviation scores.

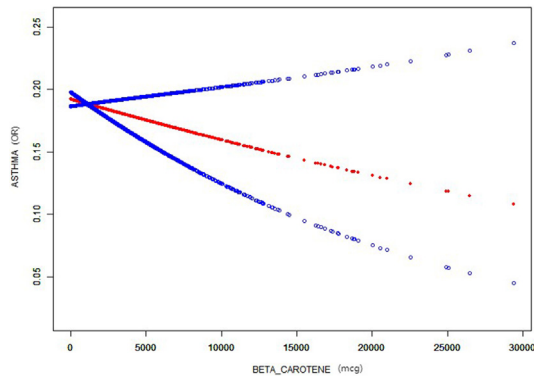


Figure S2 Association between current asthma and β -carotene intakes. The red line and blue line represent the estimated values and their corresponding 95% confidence interval. All adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; BMI-Z scores, body mass index standard deviation scores.

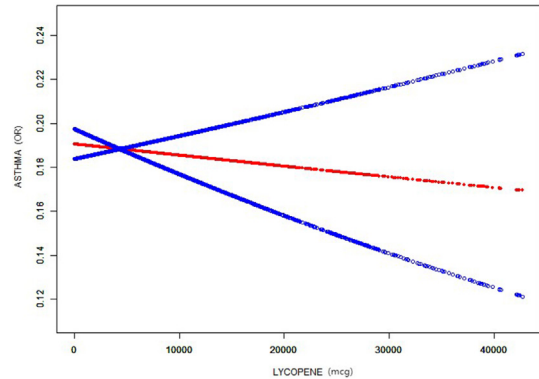


Figure S4 Association between current asthma and lycopene intakes. The red line and blue line represent the estimated values and their corresponding 95% confidence interval. All adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; BMI-Z scores, body mass index standard deviation scores.

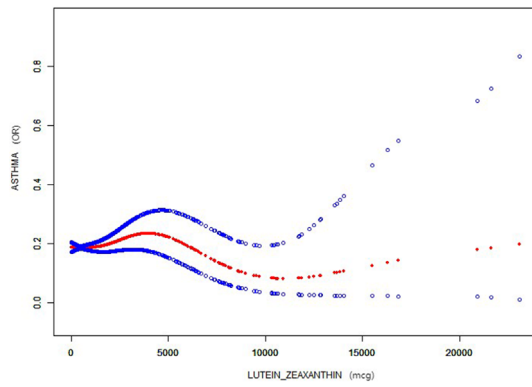


Figure S5 Association between current asthma and lutein zeaxanthin intakes. The red line and blue line represent the estimated values and their corresponding 95% confidence interval. All adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; BMI-Z scores, body mass index standard deviation score.

Table S1 Stratified analyses of the relationship between current asthma and α -carotene intakes by age, gender, and self-reported family history of asthma

Variables	Model I		Model II		Model III		P for interaction
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
Age							0.85
6–11 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.094 (0.899, 1.330)	0.37	1.111 (0.912, 1.354)	0.30	1.106 (0.877, 1.393)	0.40	
Quartile 3	1.164 (0.955, 1.418)	0.13	1.170 (0.957, 1.431)	0.12	1.268 (1.004, 1.601)	0.047	
Quartile 4	0.774 (0.629, 0.953)	0.02	0.777 (0.629, 0.961)	0.02	0.871 (0.680, 1.115)	0.27	
12–16 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.979 (0.782, 1.224)	0.85	0.970 (0.774, 1.216)	0.79	0.880 (0.658, 1.177)	0.39	
Quartile 3	0.946 (0.761, 1.176)	0.62	0.951 (0.763, 1.186)	0.66	1.076 (0.811, 1.428)	0.61	
Quartile 4	0.947 (0.758, 1.182)	0.63	0.984 (0.784, 1.236)	0.89	1.003 (0.750, 1.342)	0.98	
Gender							0.28
Male							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.050 (0.860, 1.282)	0.63	1.033 (0.844, 1.264)	0.75	1.072 (0.840, 1.369)	0.58	
Quartile 3	1.041 (0.855, 1.267)	0.69	1.047 (0.857, 1.279)	0.65	1.169 (0.918, 1.489)	0.20	
Quartile 4	0.831 (0.677, 1.020)	0.08	0.832 (0.675, 1.026)	0.09	0.936 (0.726, 1.205)	0.61	
Female							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.019 (0.821, 1.266)	0.86	1.053 (0.847, 1.311)	0.64	0.945 (0.723, 1.236)	0.68	
Quartile 3	1.066 (0.857, 1.327)	0.57	1.092 (0.875, 1.363)	0.44	1.222 (0.934, 1.600)	0.14	
Quartile 4	0.840 (0.670, 1.054)	0.13	0.880 (0.699, 1.107)	0.27	0.898 (0.678, 1.190)	0.45	
Self-reported family history of asthma							0.62
No							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.036 (0.828, 1.297)	0.75	1.036 (0.826, 1.298)	0.76	0.999 (0.769, 1.298)	0.99	
Quartile 3	1.042 (0.835, 1.301)	0.71	1.031 (0.824, 1.290)	0.79	1.038 (0.801, 1.346)	0.78	
Quartile 4	0.930 (0.743, 1.163)	0.53	0.939 (0.748, 1.179)	0.59	0.978 (0.752, 1.272)	0.87	
Yes							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.022 (0.829, 1.259)	0.84	1.037 (0.840, 1.280)	0.74	1.027 (0.802, 1.315)	0.83	
Quartile 3	1.187 (0.960, 1.466)	0.11	1.169 (0.942, 1.450)	0.16	1.327 (1.032, 1.705)	0.03	
Quartile 4	0.883 (0.707, 1.102)	0.27	0.860 (0.686, 1.079)	0.19	0.851 (0.651, 1.111)	0.24	

Each subgroup analyses adjusted for all other variables except its own. Significant values are highlighted in bold. Model I was adjusted for none. Model II was adjusted for age, gender, race, vitamin E. Model III was adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; CI, confidence interval; BMI-Z scores, body mass index standard deviation scores

Table S2 Stratified analyses of the relationship between current asthma and β -carotene intakes by age, gender, and self-reported family history of asthma

Variables	Model I		Model II		Model III		P for interaction
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
Age							0.46
6–11 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.129 (0.925, 1.378)	0.23	1.113 (0.910, 1.360)	0.30	1.156 (0.914, 1.461)	0.23	
Quartile 3	1.123 (0.920, 1.372)	0.25	1.079 (0.879, 1.324)	0.47	1.081 (0.850, 1.376)	0.52	
Quartile 4	1.068 (0.873, 1.306)	0.52	1.010 (0.821, 1.244)	0.92	1.195 (0.937, 1.523)	0.15	
12–16 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.900 (0.719, 1.127)	0.36	0.905 (0.722, 1.136)	0.39	0.959 (0.718, 1.280)	0.77	
Quartile 3	1.053 (0.847, 1.309)	0.64	1.039 (0.831, 1.299)	0.74	1.069 (0.800, 1.427)	0.65	
Quartile 4	0.869 (0.694, 1.088)	0.22	0.873 (0.690, 1.104)	0.26	0.887 (0.655, 1.202)	0.44	
Gender							0.27
Male							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.081 (0.882, 1.325)	0.45	1.085 (0.883, 1.333)	0.44	1.082 (0.845, 1.385)	0.53	
Quartile 3	1.116 (0.913, 1.364)	0.29	1.099 (0.895, 1.350)	0.37	1.016 (0.790, 1.305)	0.90	
Quartile 4	1.077 (0.879, 1.321)	0.47	1.053 (0.852, 1.302)	0.63	1.120 (0.867, 1.448)	0.39	
Female							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.943 (0.759, 1.172)	0.60	0.945 (0.759, 1.176)	0.61	1.095 (0.838, 1.431)	0.51	
Quartile 3	1.036 (0.834, 1.287)	0.75	1.026 (0.822, 1.280)	0.82	1.163 (0.885, 1.528)	0.28	
Quartile 4	0.849 (0.680, 1.060)	0.15	0.834 (0.663, 1.049)	0.12	1.007 (0.761, 1.334)	0.96	
Self-reported family history of asthma							0.98
No							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.044 (0.838, 1.301)	0.70	1.039 (0.833, 1.297)	0.73	1.095 (0.848, 1.414)	0.49	
Quartile 3	0.923 (0.737, 1.155)	0.48	0.889 (0.707, 1.118)	0.31	0.892 (0.681, 1.168)	0.41	
Quartile 4	0.941 (0.754, 1.175)	0.59	0.907 (0.722, 1.140)	0.40	0.996 (0.765, 1.297)	0.97	
Yes							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.998 (0.805, 1.237)	0.99	0.980 (0.789, 1.217)	0.86	1.064 (0.826, 1.370)	0.63	
Quartile 3	1.306 (1.056, 1.614)	0.01	1.245 (1.001, 1.548)	0.04	1.264 (0.979, 1.632)	0.07	
Quartile 4	1.130 (0.908, 1.407)	0.27	1.066 (0.848, 1.340)	0.59	1.139 (0.870, 1.491)	0.35	

Each subgroup analyses adjusted for all other variables except its own. Significant values are highlighted in bold. Model I was adjusted for none. Model II was adjusted for age, gender, race, vitamin E. Model III was adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; CI, confidence interval; BMI-Z scores, body mass index standard deviation scores.

Table S3 Stratified analyses of the relationship between current asthma and β -Cryptoxanthin intakes by age, gender, and self-reported family history of asthma

Variables	Model I		Model II		Model III		P for interaction
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
Age							0.43
6–11 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.140 (0.934, 1.392)	0.20	1.124 (0.918, 1.375)	0.26	1.374 (1.083, 1.744)	0.009	
Quartile 3	0.960 (0.785, 1.175)	0.70	0.951 (0.775, 1.167)	0.63	1.089 (0.853, 1.390)	0.49	
Quartile 4	1.015 (0.829, 1.243)	0.89	0.986 (0.801, 1.212)	0.89	1.211 (0.947, 1.547)	0.13	
12–16 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.042 (0.840, 1.292)	0.71	1.031 (0.829, 1.281)	0.78	1.042 (0.787, 1.379)	0.77	
Quartile 3	0.932 (0.743, 1.168)	0.54	0.922 (0.733, 1.160)	0.49	0.976 (0.729, 1.307)	0.87	
Quartile 4	0.861 (0.688, 1.079)	0.19	0.845 (0.672, 1.064)	0.15	0.922 (0.688, 1.237)	0.59	
Gender							0.23
Male							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.181 (0.968, 1.441)	0.10	1.166 (0.953, 1.426)	0.14	1.281 (1.001, 1.640)	0.049	
Quartile 3	0.976 (0.796, 1.198)	0.82	0.941 (0.765, 1.158)	0.56	1.082 (0.841, 1.392)	0.54	
Quartile 4	0.942 (0.768, 1.154)	0.56	0.902 (0.733, 1.111)	0.33	1.056 (0.820, 1.360)	0.67	
Female							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.987 (0.795, 1.225)	0.91	0.982 (0.789, 1.221)	0.87	1.179 (0.904, 1.539)	0.22	
Quartile 3	0.883 (0.708, 1.102)	0.27	0.915 (0.731, 1.146)	0.44	0.974 (0.738, 1.285)	0.85	
Quartile 4	0.919 (0.736, 1.149)	0.46	0.948 (0.755, 1.189)	0.64	1.119 (0.847, 1.479)	0.43	
Self-reported family history of asthma							0.36
No							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.300 (1.040, 1.624)	0.02	1.286 (1.027, 1.609)	0.03	1.321 (1.015, 1.718)	0.04	
Quartile 3	1.042 (0.827, 1.314)	0.72	1.023 (0.810, 1.292)	0.85	1.086 (0.829, 1.424)	0.55	
Quartile 4	1.039 (0.825, 1.309)	0.74	1.013 (0.801, 1.282)	0.91	1.073 (0.816, 1.410)	0.62	
Yes							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.016 (0.824, 1.254)	0.88	1.000 (0.808, 1.237)	0.99	1.160 (0.904, 1.489)	0.24	
Quartile 3	0.953 (0.770, 1.181)	0.66	0.948 (0.763, 1.179)	0.63	0.986 (0.762, 1.276)	0.92	
Quartile 4	0.992 (0.800, 1.231)	0.94	0.943 (0.756, 1.175)	0.60	1.103 (0.851, 1.429)	0.46	

Each subgroup analyses adjusted for all other variables except its own. Significant values are highlighted in bold. Model I was adjusted for none. Model II was adjusted for age, gender, race, vitamin E. Model III was adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; CI, confidence interval; BMI-Z scores, body mass index standard deviation scores.

Table S4 Stratified analyses of the relationship between current asthma and lycopene intakes by age, gender, and self-reported family history of asthma

Variables	Model I		Model II		Model III		P for interaction
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
Age							0.33
6–11 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.896 (0.735, 1.092)	0.28	0.921 (0.754, 1.125)	0.42	0.938 (0.743, 1.183)	0.59	
Quartile 3	0.926 (0.759, 1.129)	0.44	0.922 (0.754, 1.127)	0.43	0.859 (0.678, 1.087)	0.20	
Quartile 4	1.016 (0.834, 1.237)	0.88	0.963 (0.787, 1.180)	0.72	0.940 (0.742, 1.190)	0.60	
12–16 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.967 (0.768, 1.217)	0.77	0.959 (0.761, 1.210)	0.72	0.882 (0.655, 1.187)	0.41	
Quartile 3	1.071 (0.856, 1.340)	0.55	1.068 (0.852, 1.337)	0.57	1.006 (0.757, 1.338)	0.97	
Quartile 4	1.192 (0.959, 1.482)	0.11	1.132 (0.905, 1.418)	0.28	1.002 (0.754, 1.332)	0.99	
Gender							0.28
Male							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.892 (0.724, 1.098)	0.28	0.887 (0.719, 1.095)	0.27	0.911 (0.707, 1.175)	0.47	
Quartile 3	0.958 (0.785, 1.171)	0.68	0.964 (0.788, 1.181)	0.73	0.943 (0.741, 1.200)	0.63	
Quartile 4	1.057 (0.869, 1.285)	0.58	1.025 (0.838, 1.253)	0.81	0.942 (0.739, 1.201)	0.63	
Female							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.966 (0.778, 1.201)	0.76	0.986 (0.792, 1.226)	0.90	0.934 (0.717, 1.216)	0.61	
Quartile 3	0.991 (0.794, 1.238)	0.94	0.998 (0.798, 1.248)	0.99	0.880 (0.667, 1.160)	0.36	
Quartile 4	1.094 (0.877, 1.365)	0.42	1.066 (0.851, 1.337)	0.58	1.045 (0.796, 1.372)	0.75	
Self-reported family history of asthma							0.001
No							
Quartile 1	Reference		Reference		Reference		
Quartile 2	0.851 (0.682, 1.062)	0.15	0.862 (0.690, 1.078)	0.19	0.832 (0.644, 1.075)	0.16	
Quartile 3	0.942 (0.757, 1.172)	0.59	0.939 (0.753, 1.171)	0.58	0.872 (0.676, 1.126)	0.29	
Quartile 4	0.906 (0.726, 1.130)	0.38	0.846 (0.675, 1.061)	0.15	0.790 (0.609, 1.025)	0.08	
Yes							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.075 (0.864, 1.339)	0.52	1.096 (0.879, 1.368)	0.42	1.041 (0.804, 1.349)	0.76	
Quartile 3	1.039 (0.838, 1.289)	0.73	1.024 (0.823, 1.274)	0.83	0.972 (0.754, 1.254)	0.83	
Quartile 4	1.318 (1.066, 1.629)	0.01	1.250 (1.004, 1.558)	0.046	1.186 (0.919, 1.529)	0.19	

Each subgroup analyses adjusted for all other variables except its own. Significant values are highlighted in bold. Model I was adjusted for none. Model II was adjusted for age, gender, race, vitamin E. Model III was adjusted for age, gender, race, Vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; CI, confidence interval; BMI-Z scores, body mass index standard deviation scores.

Table S5 Stratified analyses of the relationship between current asthma and lutein zeaxanthin intakes by age, gender, and self-reported family history of asthma

Variables	Model I		Model II		Model III		P for interaction
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	
Age							0.45
6–11 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.072 (0.878, 1.309)	0.49	1.041 (0.850, 1.274)	0.70	1.158 (0.913, 1.469)	0.23	
Quartile 3	1.017 (0.831, 1.246)	0.87	0.972 (0.790, 1.195)	0.78	1.149 (0.903, 1.461)	0.26	
Quartile 4	1.167 (0.955, 1.426)	0.13	1.035 (0.839, 1.277)	0.75	1.142 (0.892, 1.463)	0.29	
12–16 years							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.147 (0.915, 1.437)	0.23	1.156 (0.920, 1.454)	0.21	1.179 (0.886, 1.570)	0.26	
Quartile 3	1.170 (0.937, 1.462)	0.17	1.152 (0.917, 1.446)	0.22	0.978 (0.729, 1.312)	0.88	
Quartile 4	1.028 (0.822, 1.286)	0.81	0.995 (0.786, 1.260)	0.97	0.933 (0.688, 1.265)	0.66	
Gender							0.66
Male							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.049 (0.853, 1.290)	0.65	1.026 (0.832, 1.267)	0.81	1.103 (0.858, 1.419)	0.44	
Quartile 3	1.147 (0.937, 1.404)	0.18	1.094 (0.889, 1.346)	0.39	1.121 (0.872, 1.442)	0.37	
Quartile 4	1.095 (0.893, 1.343)	0.38	1.009 (0.813, 1.252)	0.94	1.077 (0.831, 1.398)	0.57	
Female							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.130 (0.911, 1.403)	0.27	1.155 (0.929, 1.437)	0.19	1.239 (0.949, 1.616)	0.11	
Quartile 3	0.957 (0.764, 1.198)	0.70	0.980 (0.780, 1.232)	0.86	1.056 (0.800, 1.394)	0.70	
Quartile 4	1.082 (0.868, 1.348)	0.48	1.041 (0.829, 1.308)	0.73	1.043 (0.786, 1.385)	0.77	
Self-reported family history of asthma							0.73
No							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.228 (0.982, 1.535)	0.07	1.207 (0.963, 1.512)	0.10	1.213 (0.935, 1.572)	0.15	
Quartile 3	1.051 (0.836, 1.322)	0.67	1.009 (0.800, 1.273)	0.94	0.994 (0.758, 1.303)	0.96	
Quartile 4	1.091 (0.869, 1.371)	0.45	1.000 (0.789, 1.267)	0.99	1.009 (0.766, 1.330)	0.95	
Yes							
Quartile 1	Reference		Reference		Reference		
Quartile 2	1.086 (0.875, 1.347)	0.45	1.060 (0.852, 1.321)	0.60	1.098 (0.850, 1.417)	0.47	
Quartile 3	1.249 (1.008, 1.547)	0.04	1.189 (0.955, 1.481)	0.12	1.182 (0.914, 1.528)	0.20	
Quartile 4	1.238 (1.001, 1.533)	0.049	1.131 (0.902, 1.418)	0.29	1.098 (0.841, 1.434)	0.49	

Each subgroup analyses adjusted for all other variables except its own. Significant values are highlighted in bold, values are OR (95% CIs) P value unless otherwise indicated. Model I was adjusted for none. Model II was adjusted for age, gender, race, vitamin E. Model III was adjusted for age, gender, race, vitamin E, BMI-Z scores, tobacco smoke exposure, whether mother smoked when pregnant, and self-reported family history of asthma. OR, odds ratio; CI, confidence interval; BMI-Z scores, body mass index standard deviation scores.