**Supplementary Table 1**: Associations between recent summer and winter leisure sun exposure and covariates in control participants

|  |  |
| --- | --- |
| Covariate | Median (Q1, Q3) last summer leisure sun exposure (mins/day) |
|  | Summer | p | Winter | p |
| **Ancestry**  Caucasian Non-Caucasian/Mixed | 210 (150, 270)210 (127.5, 270) | 0.78 | 150 (90, 180)120 (90, 180) | 0.44 |
| **Sun sensitivity** Never burn or only after 2 hours Burn after 1-2 hours Burn within 1 hour | 210 (150, 270)210 (150, 240)195 (150, 240) | 0.20 | 150 (90, 210)150 (90, 210)120 (90, 195) | 0.82 |
| **Tanning** No tan or a light tan A medium or dark tan | 180 (150, 210)210 (150, 270) | **0.001** | 120 (90, 180)150 (90, 210) | **0.06** |
| **Sun protection at age 0-2 years** Never/rarely or occasionally Most of time Always/almost always | 150 (90, 240)180 (150, 240)210 (150, 270) | **0.01** | 120 (90, 180)120 (90, 165)150 (90, 210) | 0.05 |
| **Physical activity**Low Moderate High | 180 (120, 255)210 (150, 240)180 (127.5, 240) | 0.62 | 150 (90, 210)150 (90, 180)120 (90, 180) | 0.71 |
| **Mother cigarette smoking** No Yes | 180 (150, 240)210 (150, 270) | **0.03** | 120 (90, 180)150 (90, 210) | **0.04** |
| **Father cigarette smoking**  No Yes | 180 (150, 240)210 (150, 270) | 0.08 | 150 (90, 180)120 (90, 210) | 0.64 |
| **Mother smoking when pregnant** No  Yes | 210 (150, 240)210 (150, 270) | 0.91 | 150 (90, 180)135 (90, 210) | 0.99 |
| **Mother’s education level** Secondary school or less Trade certificate or other University qualification  | 210 (150, 270)210 (150, 270)180 (150, 240) | 0.40 | 150 (90, 210)135 (90, 210)120 (90, 180) | 0.76 |
| **Father’s education level** Secondary school or less Trade certificate or other University qualification | 210 (150, 270)195 (150, 270)210 (150, 270) | 0.70 | 150 (90, 180)135 (90, 180)150 (90, 210) | 0.84 |

**Supplementary Table 2:** Correlation matrix for potential covariates to be included in the multivariable regression (Spearman’s rho (ρ), number of observations and the p-value for the pairwise correlations) within the control sample.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Ancestry | Sun sensitivity | Tanning | Sun protection at age 0-2 y | Physical activity | Mother’s cigarette smoking | Father’s cigarette smoking | Mother smoking when pregnant | Mother’s education level | Father’s education level |
| Ancestry | 1.00 |  |  |  |  |  |  |  |  |  |
| Sun sensitivity | **ρ =-0.26****n=336****p<0.0001** | 1.00 |  |  |  |  |  |  |  |  |
| Tanning | ρ =0.03n=361p=0.57 | **ρ = -0.23****n=349****P<0.0001** | 1.00 |  |  |  |  |  |  |  |
| Sun protection at age 0-2 y | **ρ = -0.14****n=301****p=0.01** | ρ =0.13n=286**p=0.02** | ρ = -0.05n=303p=0.34 | 1.00 |  |  |  |  |  |  |
| Physical activity | ρ = -0.04n=287p=0.54 | ρ =0.02n=269p=0.72 | ρ = 0.08n=288p=0.20 | ρ =0.01n=291p=0.92 | 1.00 |  |  |  |  |  |
| Mother’s cigarette smoking | ρ = 0.04n=308p=0.54 | ρ = 0.05n=354p=0.38 | ρ = 0.02n=373p=0.66 | ρ = -0.02n=307p=0.71 | ρ = 0.05n=292p=0.37 | 1.00 |  |  |  |  |
| Father’s cigarette smoking | ρ =0.04n=308p=0.54 | ρ = 0.04n=302p=0.51 | ρ = 0.02n=317p=0.73 | ρ =0.001n=269p=0.99 | ρ = -0.11n=250p=0.09 | **ρ = 0.46****n=328****p<0.0001** | 1.00 |  |  |  |
| Mother smoking when pregnant | ρ = -0.04n=364p=0.43 | ρ = 0.07n=352p=0.16 | ρ =-0.03n=371p=0.56 | ρ = -0.06n=307p=0.26 | ρ = 0.01n=292p=0.83 | **ρ = 0.58****n=383****p<0.0001** | **ρ = 0.25****n=326****p<0.0001** | 1.00 |  |  |
| Mother’s education | ρ = -0.08n=362p=0.12 | ρ = 0.007n=355p=0.90 | ρ = -0.02n=374p=0.77 | ρ = 0.06n=308p=0.31 | ρ = -0.05n=293p=0.39 | **ρ = -0.29****n=386****p<0.0001** | **ρ = -0.23****n=329****p<0.0001** | **ρ =-0.23****n=384****p<0.0001**  | 1.00 |  |
| Father’s education level | ρ = 0.03n=315p=0.55 | ρ = 0.11n=272p=0.07 | ρ = -0.08n=324p=0.16 | ρ = 0.11n=272p=0.07 | ρ = -0.01n=253p=0.87 | **ρ = -0.24****n=335****p<0.0001** | **ρ = -0.17****n=328****p=0.002** | **ρ = -0.30****n=333****p<0.0001** | **ρ = 0.49****n=336****p<0.0001** | 1.00 |

**Supplementary Table 3** Univariable and multivariable analysis for the association between being an IBD case and leisure-time sun exposure in the previous summer and winter (10 min increment), adjusted for tanning and mother cigarette smoking. Analysis restricted to participants with data on all of the included variables (summer: n=91 cases, n=354 controls; winter: n=88 cases, n=347 controls).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Crude OR** | **CI (95%)**  | **p-value** | **Adjusted OR\*** | **CI (95%)** | **P value** |
| **Summer time in sun**  | 0.92 | 0.89, 0.96 | <0.001 | 0.93 | 0.90, 0.97 | 0.001 |
| **Tanning** |
|  No tan or a light tan | Reference |  |  | Reference |  |  |
|  A medium or dark tan | 0.67 | 0.41, 1.10 | 0.11 | 0.69 | 0.41, 1.16 | 0.16 |
| **Mother cigarette smoking** |
|  No | Reference |  |  | Reference |  |  |
|  Yes | 0.47 | 0.26, 0.86 | 0.02 | 0.56 | 0.30, 1.05 | 0.07 |
|  |  |  |  |  |  |  |
| **Winter time in sun**  | 0.93 | 0.90, 0.97 | 0.001 | 0.94 | 0.90, 0.98 | 0.004 |
| **Tanning** |  |  |  |  |  |  |
|  No tan or a light tan | Reference |  |  | Reference |  |  |
|  A medium or dark tan | 0.66 | 0.40, 1.10 | 0.12 | 0.63 | 0.37, 1.06 | 0.08 |
| **Mother cigarette smoking** |
|  No | Reference |  |  | Reference |  |  |
|  Yes | 0.47 | 0.26, 0.86 | 0.02 | 0.60 | 0.32, 1.14 | 0.12 |

\* Adjusted for the other factors in the table.

**Supplementary Table 4** Univariate and multivariable analysis for the association between being an IBD case and leisure-time sun exposure in the previous summer and winter (10 min increment), adjusted for tanning and mother’s cigarette smoking. Analysis restricted to cases where the diagnosis was in the previous year (summer: n=38 cases, n=159 controls; winter: n=36 cases, n=153 controls)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Crude OR** | **CI (95%)**  | **p-value** | **Adjusted OR\*** | **CI (95%)** | **P value** |
| **Summer time in sun**  | 0.95 | 0.90, 1.01 | 0.10 | 0.96 | 0.91, 1.02 | 0.21 |
| **Tanning** |
|  No tan or a light tan | Reference |  |  | Reference |  |  |
|  A medium or dark tan | 0.54 | 0.25, 1.18 | 0.12 | 0.51 | 0.22, 1.15 | 0.11 |
| **Mother cigarette smoking** |
|  No | Reference |  |  | Reference |  |  |
|  Yes | 0.50 | 0.17, 1.44 | 0.20 | 0.50 | 0.17, 1.52 | 0.22 |
|  |  |  |  |  |  |  |
| **Winter time in sun**  | 0.94 | 0.89, 1.01 | 0.08 | 0.94 | 0.88, 1.00 | 0.06 |
| **Tanning** |
|  No tan or a light tan | Reference |  |  | Reference |  |  |
|  A medium or dark tan | 0.54 | 0.24, 1.18 | 0.12 | 0.47 | 0.20, 1.11 | 0.09 |
| **Mother cigarette smoking** |
|  No | Reference |  |  | Reference |  |  |
|  Yes | 0.50 | 0.17, 1.44 | 0.20 | 0.48 | 0.16, 1.51 | 0.21 |

\* Adjusted for the other factors in the table