**Table S1. The association between smoking status and incidence of invasive melanoma across strata of cumulative sun exposure**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter |  | Minimally adjusted model1 |  | Fully adjusted model2 | | |
| **Total cohort**  **HR (95% CI)** | **Total cohort**  **HR (95% CI)** | **Males**  **HR (95% CI)** | **Females**  **HR (95% CI)** |
|  |  |  |  |  |  |  |
| Cumulative sun exposure (Q1 and Q2)3  Smoking status |  |  |  |  |  |  |
| Never smoker |  | 1.00 |  | 1.00 | 1.00 | 1.00 |
| Ever smoker |  | 0.81 (0.53-1.24) |  | 0.95 (0.62-1.47) | 1.02 (0.52-2.02) | 0.90 (0.51-1.61) |
| Ex-smoker |  | 0.78 (0.49-1.23) |  | 0.92 (0.57-1.45) | 0.93 (0.44-1.95) | 0.89 (0.49-1.66) |
| Current smoker |  | 0.94 (0.40-2.20) |  | 1.19 (0.51-2.82) | 1.65 (0.48-5.61) | 0.89 (0.27-2.99) |
| *p-*value |  | 0.6 |  | 0.8 | 0.7 | 0.9 |
| Cumulative sun exposure (Q3 and Q4)4 |  |  |  |  |  |  |
| Smoking status |  |  |  |  |  |  |
| Never smoker |  | 1.00 |  | 1.00 | 1.00 | 1.00 |
| Ever smoker |  | 0.67 (0.46-1.03) |  | 0.76 (0.53-1.11) | 0.79 (0.52-1.20) | 0.68 (0.28-1.66) |
| Ex-smoker |  | 0.63 (0.42-1.01) |  | 0.69 (0.46-1.04) | 0.69 (0.44-1.09) | 0.75 (0.30-1.87) |
| Current smoker |  | 0.85 (0.47-1.55) |  | 1.10 (0.60-2.01) | 1.29 (0.67-2.46) | 0.43 (0.06-3.37) |
| *p-*value |  | 0.03 |  | 0.2 | 0.3 | 0.6 |

1Models were adjusted for age and sex

2Models were adjusted for age, sex, natural skin colour, tanning tendency, number of moles at age 21, past history of skin cancer surgically removed, past history of skin cancer destructively removed, history of sunburn as a child, and family history of melanoma.

3First and second quartiles

4Third and fourth quartiles

**Table S2. The association between smoking and all melanoma (invasive and in situ)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Number of Cases | Total cohort  HR1 (95% CI) | Males  HR1 (95% CI) | Females  HR1 (95% CI) |
| Smoking status |  |  |  |  |
| Never smoker2 | 374 | 1.00 | 1.00 | 1.00 |
| Ever smoker | 267 | 0.85 (0.73-1.01) | 0.91 (0.74-1.12) | 0.75 (0.58-0.97) |
| Ex-smoker | 219 | 0.86 (0.72-1.02) | 0.90 (0.72-1.12) | 0.77 (0.58-1.02) |
| Current smoker | 48 | 0.84 (0.62-1.12) | 0.95 (0.65-1.39) | 0.68 (0.41-1.14) |
| *p-*value |  | 0.2 | 0.7 | 0.1 |
| Age (years) at starting smoking |  |  |  |  |
| Never | 374 | 1.00 | 1.00 | 1.00 |
| ≤16 | 97 | 0.71 (0.56-0.90) | 0.69(0.44-1.09) | 0.63 (0.41-0.97) |
| >16 | 164 | 0.95 (0.79-1.15) | 1.03 (0.70-1.53) | 0.81 (0.60-1.10) |
| *p-*value3 |  | 0.02 | 0.03 | 0.3 |
| Duration (years) of smoking |  |  |  |  |
| Never | 374 | 1.00 | 1.00 | 1.00 |
| ≤10 | 56 | 0.87 (0.65-1.15) | 0.92 (0.64-1.34) | 0.79 (0.50-1.23) |
| 11-20 | 63 | 0.88 (0.67-1.15) | 0.93 (0.66-1.31) | 0.77 (0.48-1.24) |
| 21-30 | 59 | 0.91 (0.69-1.21) | 0.95 (0.67-1.33) | 0.85 (0.53-1.38) |
| >30 | 82 | 0.77 (0.60-0.99) | 0.85 (0.63-1.15) | 0.60 (0.38-0.96) |
| *p-*trend3 |  | 0.4 | 0.6 | 0.5 |
| Intensity of smoking (cigarettes/day) |  |  |  |  |
| Never | 374 | 1.00 | 1.00 | 1.00 |
| ≤10 | 75 | 0.90 (0.70-1.15) | 0.97 (0.69-1.36) | 0.82 (0.57-1.17) |
| 11-20 | 114 | 0.87 (0.70-1.08) | 0.92 (0.71-1.21) | 0.77 (0.53-1.12) |
| >20 | 67 | 0.74 (0.56-0.96) | 0.80 (0.59-1.09) | 0.58 (0.33-1.02) |
| *p-*trend3 |  | 0.1 | 0.3 | 0.3 |
| Pack-years of smoking |  |  |  |  |
| Never | 374 | 1.00 | 1.00 | 1.00 |
| ≤10 | 83 | 0.91 (0.71-1.15) | 0.87 (0.62-1.21) | 0.94 (0.67-1.33) |
| 11-20 | 52 | 0.82 (0.61-1.09) | 1.05 (0.75-1.48) | 0.39 (0.20-0.77) |
| 21-30 | 51 | 1.07 (0.79-1.44) | 1.10 (0.76-1.59) | 1.06 (0.63-1.77) |
| >30 | 68 | 0.69 (0.52-0.89) | 0.74 (0.54-1.01) | 0.56 (0.33-0.97) |
| *p-*trend3 |  | 0.08 | 0.2 | 0.3 |
| Years since quitting (past smokers) |  |  |  |  |
| Never | 374 | 1.00 | 1.00 | 1.00 |
| ≤10 | 40 | 0.73 (0.53-1.02) | 0.82 (0.55-1.24) | 0.59 (0.32-1.08) |
| 11-20 | 51 | 0.92 (0.68-1.24) | 0.99 (0.68-1.44) | 0.80 (0.48-1.33) |
| 21-30 | 66 | 0.89 (0.68-1.17) | 0.86 (0.61-1.21) | 0.93 (0.61-1.42) |
| >30 | 59 | 0.88 (0.68-1.16) | 0.96 (0.69-1.33) | 0.59 (0.31-1.09) |
| *p-*trend3 |  | 0.5 | 0.6 | 0.7 |

1Models were adjusted for age, sex, natural skin colour, tanning tendency, number of moles at age 21, past history of skin cancer surgically removed, past history of skin cancer destructively removed, history of sunburn as a child, cumulative sun exposure and family history of melanoma.

2‘Never smoker’ was the reference category for all analyses.

*3p-*Trend values do not include reference group (p-value for the exact Cochran-Armitage trend test)

**Table S3. The association between smoking and invasive melanoma –sensitivity analyses around the treatment of *in situ* melanoma arising during follow-up**

|  |  |  |
| --- | --- | --- |
| Parameter | Sensitivity Analysis 1:  Ignore *in situ* melanoma during follow-up  HR1 (95% CI) | Sensitivity Analysis 2:  treating *in situ* melanoma as time varying covariate  HR1 (95% CI) |
| Smoking status |  |  |
| Never smoker2 | 1.00 | 1.00 |
| Ever smoker | 0.81 (0.62-1.04) | 0.81 (0.63-1.05) |
| Ex-smoker | 0.76 (0.58-1.01) | 0.76 (0.58-1.01) |
| Current smoker | 1.04 (0.66-1.63) | 1.04 (0.67-1.64) |
| *p-*value | 0.1 | 0.1 |
| Age (years) at starting smoking |  |  |
| Never | 1.00 | 1.00 |
| ≤16 | 0.61 (0.41-0.91) | 0.62 (0.42-0.91) |
| >16 | 0.96 (0.72-1.28) | 0.96 (0.72-1.28) |
| *p-*value3 | 0.04 | 0.04 |
| Duration (years) of smoking |  |  |
| Never | 1.00 | 1.00 |
| ≤10 | 0.97 (0.63-1.49) | 0.98 (0.63-1.51) |
| 11-20 | 0.98 (0.65-1.47) | 0.98 (0.65-1.47) |
| 21-30 | 0.59 (0.35-1.02) | 0.60 (0.35-1.02) |
| >30 | 0.72 (0.48-1.07) | 0.72 (0.48-1.08) |
| *p-*trend3 | 0.1 | 0.1 |
| Intensity of smoking (cigarettes/day) |  |  |
| Never | 1.00 | 1.00 |
| ≤10 | 1.15 (0.80-1.64) | 1.16 (0.81-1.65) |
| 11-20 | 0.78 (0.55-1.10) | 0.78 (0.55-1.11) |
| >20 | 0.52 (0.32-0.84) | 0.52 (0.32-0.85) |
| *p-*trend3 | 0.001 | 0.001 |
| Pack-years of smoking |  |  |
| Never | 1.00 | 1.00 |
| ≤10 | 1.01 (0.71-1.46) | 1.02 (0.71-1.47) |
| 11-20 | 0.73 (0.45-1.19) | 0.73 (0.45-1.19) |
| 21-30 | 1.04 (0.65-1.67) | 1.03 (0.42-1.66) |
| >30 | 0.56 (0.35-0.88) | 0.56 (0.35-0.88) |
| *p-*trend3 | 0.02 | 0.02 |
| Years since quitting (past smokers) |  |  |
| Never | 1.00 | 1.00 |
| ≤10 | 0.36 (0.17-0.77) | 0.35 (0.16-0.76) |
| 11-20 | 0.80 (0.48-1.33) | 0.80 (0.48-1.33) |
| 21-30 | 0.73 (0.47-1.16) | 0.73 (0.46-1.16) |
| >30 | 1.08 (0.72-1.61) | 1.08 (0.72-1.62) |
| *p-*trend3 | 0.02 | 0.02 |

1Models were adjusted for age, sex, natural skin colour, tanning tendency, number of moles at age 21, past history of skin cancer surgically removed, past history of skin cancer destructively removed, history of sunburn as a child, cumulative sun exposure and family history of melanoma.

2‘Never smoker’ was the reference category for all analyses.

*3p-*Trend values do not include reference group (p-value for the exact Cochran-Armitage trend test)