**Supplementary Material**

**Additional file 1:**

**Article:** Head and neck cancer and occupational exposure to leather dust: results from the ICARE study, a French case-control study

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Table S1: Formula and weight for calculating the cumulative exposure index (CEI) to leather dust.

Table S2: Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by sex.

Table S3: Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by tobacco smoking status.

Table S4: Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by alcohol drinking status.

**Table S1.** Formula and weight for calculating the cumulative exposure index (CEI) to leather dust.

CEI = Σ lifetime (weighted duration \* weighted probability \* weighted level)

|  |  |  |
| --- | --- | --- |
| **Leather dust** | | |
| **Parameter** | **Definition** | **Weight** |
| **Probability of exposure** | **% of workers of the employment concerned** |  |
| 0 | P≤ 1% | 0 |
| 1 | 1<P≤ 10% | 0.05 |
| 2 | 10<P≤ 50% | 0.3 |
| 3 | 50<P≤ 90% | 0.7 |
| 4 | P>90% | 0.95 |
| **Level of exposure** | **Concentration in mg/m3** |  |
| 0 | N = 0 | 0 |
| 1 | N< 1 | 0.5 |
| 2 | 1≤N< 3 | 2 |
| 3 | 3≤N<7 | 5 |
| 4 | N≥7 | 10 |

**Table S2. Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by sex.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ***All subjects (n=5716)*** | | |  |  | ***Males (n=4642)*** | | ***Females (n=1074)*** | | | |
|  |  | **Cases|Controls** | | **OR1 [95% CI]** |  | **Cases|Controls** | | **OR1 [95% CI]** | |  | **Cases|Controls** | **OR1 [95% CI]** |
| **Exposure to leather dust** | |  |  |  |  |  | |  | |  |  |  |
| Never exposed \* | |  | 2087|3476 | reference |  | 1797|2728 | | reference | |  | 290|748 | reference |
| Ever exposed | |  | 57|75 | 0.99 [0.62-1.56] |  | 50|50 | | 1.08 [0.65-1.80] | |  | 7|25 | 0.65 [0.21-2.01] |
| **Maximum probability of exposure (%)** | | | |  |  |  | |  | |  |  |  |
| ≤ 50 | |  | 26|32 | 1.17 [0.59-2.31] |  | 23|24 | | 1.31 [0.63-2.70] | |  | 3|8 | 0.47 [0.05-4.32] |
| > 50 | |  | 31|43 | 0.86 [0.47-1.58] |  | 27|26 | | 0.90 [0.44-1.82] | |  | 4|17 | 0.72 [0.20-2.57] |
| **Maximal level of exposure (mg/m3)** | | | |  |  |  | |  | |  |  |
| < 3 | |  | 41|50 | 1.09 [0.63-1.89] |  | 37|30 | | 1.41 [0.75-2.65] | |  | 4|20 | 0.37 [0.08-1.74] |
| ≥ 3 | |  | 16|25 | 0.79 [0.35-1.77] |  | 13|20 | | 0.63 [0.26-1.53] | |  | 3|5 | 1.52 [0.27-8.53] |
| **Cumulative duration of exposure (years)** | | | |  |  |  | |  | |  |  |  |
| ≤ 7 | |  | 45|43 | 1.22 [0.70-2.14] |  | 39|29 | | 1.39 [0.74-2.63] | |  | 6|14 | 0.81 [0.21-3.06] |
| > 7 | |  | 12|32 | 0.63 [0.28-1.44] |  | 11|21 | | 0.65 [0.26-1.60] | |  | 1|11 | 0.39 [0.04-3.50] |
| **Cumulative exposure index (mg/m3-years)** | | | |  |  |  | |  | |  |  |
| ≤ 6 | |  | 37|38 | 1.43 [0.78-2.61] |  | 32|25 | | 1.57 [0.80-3.08] | |  | 5|13 | 0.93 [0.20-4.32] |
| > 6 | |  | 20|37 | 0.60 [0.29-1.22] |  | 18|25 | | 0.63 [0.28-1.40] | |  | 2|12 | 0.44 [0.08-2.36] |

\* Never exposed = reference category for all variables presented in this table.

1 ORs (odds ratios) adjusted for age, sex, area of residence, socioeconomic status, and tobacco and alcohol consumption.

**Table S3. Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by tobacco smoking status.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***All subjects (n=5716)*** | |  |  | ***Never smokers (n=1372) Ever smokers (n=4322)*** | | | | |
| **Cases|Controls** | **OR1[95% CI]** |  | **Cases|Controls** | | **OR1 [95% CI]** |  | **Cases|Controls** | **OR1 [95% CI]** |
| **Exposure to leather dust** |  |  |  |  | |  |  |  |  |
| Never exposed \* | 2087|3476 | reference |  | 107|1232 | | reference |  | 1973|2232 | reference |
| Ever exposed | 57|75 | 0.99 [0.62-1.56] |  | 2|28 | | 0.69 [0.15-3.12] |  | 55|47 | 1.11 [0.68-1.80] |
| **Maximum probability of exposure (%)** | |  |  |  | |  |  |  |  |
| ≤ 50 | 26|32 | 1.17 [0.59-2.31] |  | 0|10 | | - |  | 26|22 | 1.50 [0.73-3.07] |
| > 50 | 31|43 | 0.86 [0.47-1.58] |  | 2|18 | | 1.13 [0.24-5.25] |  | 29|25 | 0.87 [0.46-1.66] |
| **Maximal level of exposure (mg/m3)** | |  |  |  | |  |  |  |
| < 3 | 41|50 | 1.09 [0.63-1.89] |  | 1|19 | | 0.51 [0.06-4.05] |  | 40|31 | 1.39 [0.76-2.51] |
| ≥ 3 | 16|25 | 0.79 [0.35-1.77] |  | 1|9 | | 1.10 [0.12-9.72] |  | 15|16 | 0.72 [0.31-1.64] |
| **Cumulative duration of exposure (years)** | |  |  |  | |  |  |  |  |
| ≤ 7 | 45|43 | 1.22 [0.70-2.14] |  | 1|16 | | 0.85 [0.10-6.83] |  | 44|27 | 1.41 [0.78-2.57] |
| > 7 | 12|32 | 0.63 [0.28-1.44] |  | 1|12 | | 0.58 [0.07-4.76] |  | 11|20 | 0.66 [0.27-1.60] |
| **Cumulative exposure index (mg/m3-years)** | |  |  |  | |  |  |  |
| ≤ 6 | 37|38 | 1.43 [0.78-2.61] |  | 1|14 | | 0.69 [0.08-5.73] |  | 36|24 | 1.73 [0.90-3.32] |
| > 6 | 20|37 | 0.60 [0.29-1.22] |  | 1|14 | | 0.69 [0.08-5.72] |  | 19|23 | 0.63 [0.30-1.31] |

\* Never exposed = reference category for all variables presented in this table.

1 ORs (odds ratios) adjusted for age, sex, area of residence, socioeconomic status, and tobacco and alcohol consumption.

**Table S4. Odds ratios for head and neck cancer associated with occupational exposure to leather dust, stratified by alcohol drinking status.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***All subjects (n=5716)*** | | | |  | |  | | ***Never drinkers (n=409) Drinkers (n=5231)*** | | | | | | | |
| **Cases|Controls** | | **OR1[95% CI]** | |  | | **Cases|Controls** | | | **OR1 [95% CI]** | |  | **Cases|Controls** | | **OR1 [95% CI]** | |
| **Exposure to leather dust** | |  | |  | |  | |  | | |  |  | |  | |  |
| Never exposed \* | 2087|3476 | | reference | |  | | 98|299 | | | reference | |  | 1943|3157 | | reference | |
| Ever exposed | 57|75 | | 0.99 [0.62-1.56] | |  | | 3|6 | | | 1.67 [0.28-9.65] | |  | 54|68 | | 1.06 [0.66-1.70] | |
| **Maximum probability of exposure (%)** | | |  | |  | |  | | |  | |  |  | |  | |
| ≤ 50 | 26|32 | | 1.17 [0.59-2.31] | |  | | 1|1 | | | 10.55 [0.30-366.65] | |  | 25|30 | | 1.21 [0.61-2.41] | |
| > 50 | 31|43 | | 0.86 [0.47-1.58] | |  | | 2|5 | | | 0.93 [0.11-7.36] | |  | 29|38 | | 0.95 [0.50-1.79] | |
| **Maximal level of exposure (mg/m3)** |  | |  | |  | |  | | |  | |  |  | |
| < 3 | 41|50 | | 1.09 [0.63-1.89] | |  | | 1|3 | | | 3.51 [0.22-54.44] | |  | 40|46 | | 1.28 [0.73-2.25] | |
| ≥ 3 | 16|25 | | 0.79 [0.35-1.77] | |  | | 2|3 | | | 1.08 [0.12-9.69] | |  | 14|22 | | 0.69 [0.30-1.62] | |
| **Cumulative duration of exposure (years)** | | |  | |  | |  | | |  | |  |  | |  | |
| ≤ 7 | 45|43 | | 1.22 [0.70-2.14] | |  | | 2|3 | | | 1.24 [0.13-11.37] | |  | 43|39 | | 1.38 [0.77-2.49] | |
| > 7 | 12|32 | | 0.63 [0.28-1.44] | |  | | 1|3 | | | 2.64 [0.19-36.74] | |  | 11|29 | | 0.63 [0.27-1.46] | |
| **Cumulative exposure index (mg/m3-years)** | | |  | |  | |  | | |  | |  |  | |
| ≤ 6 | 37|38 | | 1.43 [0.78-2.61] | |  | | 1|1 | | | 10.55 [0.30-366.65] | |  | 36|36 | | 1.48 [0.80-2.71] | |
| > 6 | 20|37 | | 0.60 [0.29-1.22] | |  | | 2|5 | | | 0.93 [0.11-7.36] | |  | 18|32 | | 0.65 [0.30-1.37] | |

\* Never exposed = reference category for all variables presented in this table.

1 ORs (odds ratios) adjusted for age, sex, area of residence, socioeconomic status, and tobacco and alcohol consumption.