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| **Table 1. Description of the included (sub) cohort studies** | | | | | | | | | | | | | | |
|  | | **Total participants** | **Baseline period** | **End of follow-up** | **Baseline age**  **Mean (SD)** | **Lung cancers** | **Males**  **%** | **Current smokers**  **%** | **Cigarettes /daya**  **Mean (SD)** | **Years of smokinga**  **Mean (SD)** | **BMI ≥ 25 kg/m2**  **%** | **Not em-ployed %** | **Married/**  **cohabiting**  **%** | **Neighborhood incomeb**  **Mean (SD)** |
| CEANS  Stockholm, Sweden | |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | SDPP | 7,305 | 1992–1998 | 31-12-2011 | 47.0 (4.9) | 42 | 41 | 26 | 13.5 (7.4) | 27.8 (8.6) | 51 | 9 | 84 | 24.3 (4.2) |
|  | SIXTY | 3,660 | 1997–1999 | 31-12-2011 | 60 (0) | 38 | 50 | 21 | 13.3 (7.7) | 27.8 (8.6) | 65 | 32 | 74 | 24.7 (6.8) |
|  | SALT | 5,625 | 1998–2003 | 31-12-2011 | 57.3 (10.4) | 43 | 47 | 21 | 12.7 (8.0) | 37.6 (9.1) | 41 | 33 | 68 | 25.4 (6.6) |
|  | SNAC-K | 2,359 | 2001–2004 | 31-12-2011 | 72.5 (10.4) | 21 | 38 | 15 | 11.7 (8.3) | 43.2 (13.5) | 53 | 76 | 46 | 28.7 (2.2) |
| DCH, Copenhagen /Aarhus, Denmark | | 52,779 | 1993–1997 | 31-12-2015 | 56.7 (4.4) | 1,474 | 47 | 36 | 16.5 (9.0) | 36.3 (7.7) | 56 | 22 | 71 | 20.1 (3.4) |
| DNC,  Denmark | |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | DNC-1993 | 15,556 | 1993 | 31-12-2012 | 56.0 (8.3) | 299 | 0 | 37 | 13.8 (8.1) | 31.4 (9.9) | 28 | 29 | 68 | 19.2 (2.6) |
|  | DNC-1999 | 7,430 | 1999 | 31-12-2012 | 47.9 (4.1) | 25 | 0 | 33 | 13.2 (7.4) | 27.1 (7.1) | 30 | 5 | 76 | 19.0 (2.4) |
| EPIC-NL,  Netherlands | |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | MORGEN | 17,792 | 1993–1997 | 31-12-2012 | 42.7 (11.2) | 170 | 46 | 35 | 15.7 (8.6) | 24.5 (10.6) | 49 | 31 | 65 | 12.2 (1.6) |
|  | Prospect | 13,640 | 1993–1997 | 31-12-2012 | 57.6 (6.0) | 191 | 0 | 23 | 13.6 (8.7) | 36.7 (7.6) | 55 | 49 | 77 | 13.1 (1.4) |
| HNR,  Ruhr area, Germany | | 3,611 | 2000–2003 | 26-04-2017 | 59.1 (7.7) | 69 | 50 | 25 | 19.1 (12.5) | 33.9 (9.2) | 73 | 57 | 75 | 25.1 (8.1) |
| E3N,  France | | 36,258 | 1989–1991 | 08-12-2014 | 52.8 (6.7) | 157 | 0 | 13 | 11.3 (9.1) | 28.5 (7.6) | 21 | 31 | 84 | 11.2 (3.0) |
| VHM&PP,  Vorarlberg, Austria | | 140,089 | 1985–2005 | 31-12-2014 | 41.7 (14.9) | 1,387 | 44 | 20 | 15.6 (8.9) | 13.4 (8.2) | 42 | 29 | 69 | 22.9 (1.7) |
| **Pooled cohort** | | **306,104** | **1985-2005** | **2011–2017** | **48.3 (13.4)** | **3,916** | **34** | **24** | **15.2 (8.9)** | **25.3 (13.1)** | **43** | **29** | **72** | **19,8 (5,3)** |
| CEANS: Cardiovascular Effects of Air Pollution and Noise in Stockholm; SDPP: The Stockholm Diabetes Preventive Program; SIXTY: The Stockholm cohort of 60-year-olds; SALT: Screening Across the Lifespan Twin Study; SNAC-K: The Swedish National Study of Aging and Care in Kungsholmen; DCH: Diet, Cancer and Health; DNC: Danish Nurses Cohort; EPIC-NL: European Prospective Investigation into Cancer and Nutrition, the Netherlands; MORGEN: Monitoring Project on Risk Factors and chronic diseases in the Netherlands; HNR: Heinz Nixdorf Recall study; E3N (EPIC-France): Etude Epidémiologique auprès de femmes de la Mutuelle Générale de l'Education Nationale; VHM&PP: Vorarlberg Health Monitoring and Prevention Programme.  aAmong current smokers at baseline.  bEuros x 1,000, year 2001. | | | | | | | | | | | | | | |

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| **Figure 1. Distribution of PM2.5 components for the year 2010 at baseline addresses estimated from SLR and random forest models.** |
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| The box boundaries indicate P25 and P75; the bold line in the middle of the box – P50; whiskers indicate P5 and P95. |

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| **Table 2.** Pooled analyses of PM2.5 components (SLR) exposure and risk of lung cancer | | | | | | | | | | | | | |
|  |  |  | **Model 1a**  N=306,104 | | |  | **Model 2b**  N=306,104 | | |  | **Model 3c**  N=306,104 | | |
| **PM2.5 component** | | *Increment* | **HR** | **95% CI** | |  | **HR** | **95% CI** | |  | **HR** | **95% CI** | |
|  | PM2.5 mass | 5 μg/m3 | 1.19 | 1.11 | 1.28 |  | 1.12 | 1.04 | 1.22 |  | 1.14 | 1.05 | 1.23 |
|  | PM2.5 Cu | 5 ng/m3 | 1.21 | 1.12 | 1.32 |  | 1.02 | 0.94 | 1.11 |  | 1.04 | 0.96 | 1.13 |
|  | PM2.5 Fe | 100 ng/m3 | 1.26 | 1.16 | 1.38 |  | 1.02 | 0.93 | 1.12 |  | 1.04 | 0.95 | 1.14 |
|  | PM2.5 K | 50 ng/m3 | 1.12 | 1.06 | 1.18 |  | 1.09 | 1.04 | 1.15 |  | 1.10 | 1.05 | 1.16 |
|  | PM2.5 Ni | 1 ng/m3 | 1.23 | 1.17 | 1.30 |  | 1.10 | 1.04 | 1.16 |  | 1.09 | 1.02 | 1.15 |
|  | PM2.5 S | 200 ng/m3 | 1.45 | 1.31 | 1.59 |  | 1.23 | 1.12 | 1.35 |  | 1.22 | 1.11 | 1.35 |
|  | PM2.5 Si | 100 ng/m3 | 1.84 | 1.56 | 2.18 |  | 1.17 | 0.98 | 1.39 |  | 1.14 | 0.96 | 1.35 |
|  | PM2.5 V | 2 ng/m3 | 1.18 | 1.14 | 1.24 |  | 1.08 | 1.03 | 1.13 |  | 1.07 | 1.02 | 1.12 |
|  | PM2.5 Zn | 10 ng/m3 | 1.09 | 1.05 | 1.13 |  | 1.02 | 0.98 | 1.07 |  | 1.03 | 0.98 | 1.07 |
| HR, hazard ratio; CI, confidence interval  aAdjusted for study (strata), age (time-scale), sex (strata), year of baseline visit  bFurther adjusted for smoking status, duration, intensity, intensity², BMI, marital status, and employment status  cFurther adjusted for 2001 mean income at the neighborhood level | | | | | | | | | | | | | |

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| **Table 3.** Pooled two-pollutant analyses of PM2.5 components (SLR) and co-pollutants and risk of lung cancer | | | | | | | | | | | | | |
|  |  |  | **Single pollutanta**  N=306,104 | | |  | **Adjusted for PM2.5 mass**  N=306,104 | | |  | **Adjusted for NO2**  N=306,104 | | |
| **PM2.5 component** | | *Increment* | **HR** | **95% CI** | |  | **HR** | **95% CI** | |  | **HR** | **95% CI** | |
|  | PM2.5 Cu | 5 ng/m3 | 1.04 | 0.96 | 1.13 |  | 0.92 | 0.82 | 1.03 |  | 1.04 | 0.90 | 1.20 |
|  | PM2.5 Fe | 100 ng/m3 | 1.04 | 0.95 | 1.14 |  | 0.92 | 0.83 | 1.03 |  | 1.02 | 0.86 | 1.21 |
|  | PM2.5 K | 50 ng/m3 | 1.10 | 1.05 | 1.16 |  | 1.08 | 1.01 | 1.15 |  | 1.10 | 1.04 | 1.16 |
|  | PM2.5 Ni | 1 ng/m3 | 1.09 | 1.02 | 1.15 |  | 1.05 | 0.99 | 1.12 |  | 1.10 | 1.03 | 1.18 |
|  | PM2.5 S | 200 ng/m3 | 1.22 | 1.11 | 1.35 |  | 1.21 | 1.06 | 1.39 |  | 1.31 | 1.17 | 1.48 |
|  | PM2.5 Si | 100 ng/m3 | 1.14 | 0.96 | 1.35 |  | 1.01 | 0.83 | 1.22 |  | 1.17 | 0.92 | 1.49 |
|  | PM2.5 V | 2 ng/m3 | 1.07 | 1.02 | 1.12 |  | 1.05 | 0.99 | 1.10 |  | 1.07 | 1.02 | 1.13 |
|  | PM2.5 Zn | 10 ng/m3 | 1.03 | 0.98 | 1.07 |  | 0.98 | 0.93 | 1.27 |  | 1.02 | 0.98 | 1.07 |
| HR, hazard ratio; CI, confidence interval  aAdjusted for study (strata), age (time-scale), sex (strata), year of baseline visit, smoking status, duration, intensity, intensity², BMI, marital status, employment status, and 2001 mean income at the neighborhood level | | | | | | | | | | | | | |

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| **Figure 2.** Natural spline functions (3 df) of PM2.5 components (SLR) and lung cancer incidence | | |
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| **Figure 3. Associations between PM2.5 components and lung cancer based on SLR and random forest exposure algorithms (N=306,104)** |
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| SLR, Supervised Linear regression; RF, Random Forest  Model 3 estimates adjusted for study (strata), age (time-scale), sex (strata), year of baseline visit, smoking status, duration, intensity, intensity², BMI, marital status, employment status, and 2001 mean income at the neighborhood level |