**SUPPLEMENTAL MATERIAL**

**Long-Term Exposure to Traffic-Related Air Pollution, Traffic Noise and Incident Hypertension: An Analysis in the European Study of Cohorts for Air Pollution Effects (ESCAPE)**

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**Cohort acronyms**

HUBRO = Oslo Health Study

SDPP = Stockholm diabetes preventive program

SNAC-K = the Swedish National study of Aging and Care in Kungsholmen

DCH = the Diet, Cancer and Health Cohort

HNR = the Heinz Nixdorf Risk Factors, Evaluation of Coronary Calcification, and Lifestyle study

KORA = the Cooperative Health Research in the Region of Augsburg

REGICOR = Registre Gironí del Cor – Girona’s heart registry

**Cohort-specific sensitivity analyses**

We performed the following sensitivity analyses: (i) adding a random intercept to account for area-level clustering; (ii) including additional covariates for fruit and vegetable consumption, where available; (iii) excluding participants who changed their residence during the follow-up period; (iv) adjusting for short-term air pollution and meteorology at the time of follow-up examination to account for short-term effects; (v) defining alternative outcomes: measured hypertension as systolic BP ≥ 160 mmHg or diastolic BP ≥ 95 mmHg or current intake of BPLM (to reduce false positive hypertensive cases) and measured hypertension as systolic BP ≥130 mmHg or diastolic BP ≥85 mmHg or current intake of BPLM (to include prehypertension).

**Tables**

**Table S1**

Description of baseline characteristics of cohorts included in the analysis of incident measured hypertension. Missing values for exposure, prevalent hypertension and blood pressure lowering medication intake, and covariates excluded.

| Parameter | SDPP | SNAC-K | HNR | KORA | REGICOR |
| --- | --- | --- | --- | --- | --- |
| N | 4,196 | 457 | 1,759 | 3,250 | 1,234 |
| Systolic blood pressure (mmHg; mean ± SD) | 116.6 ± 10.1 | 121.8 ± 9.4 | 119.8 ± 12.2 | 119.2 ± 11.2 | 115.9 ± 11.4 |
| Diastolic blood pressure (mmHg; mean ± SD) | 73.4 ± 7.2 | 74.9 ± 7.2 | 76.2 ± 7.4 | 75.8 ± 7.5 | 74.4 ± 7.6 |
| Self-reported hypertension at baseline (%) | Not available | 1.8% | 11.2% | 14.4% | 9.1% |
| Men (%) | 39.0% | 40.0% | 42.3% | 43.1% | 42.1% |
| Age (years; mean ± SD) | 46.8 ± 5.0 | 67.5 ± 8.5 | 56.9 ± 7.2 | 45.7 ± 12.3 | 51.5 ± 10.3 |
| Body mass index [kg/m²; mean ± SD) | 25.0 ± 3.5 | 24.9 ± 3.3 | 26.5 ± 3.9 | 26.0 ± 4.1 | 25.6 ± 3.8 |
| Area unemployment (%; mean ± SD) | 21.3 ± 2.9 | 2.1 ± 0.2 | 12.3 ± 3.4 | 27.2 ± 18.4 | 7.6 ± 2.7 |
| Current smoker (%) | 25.6% | 12.9% | 26.0% | 25.7% | 23.2% |
| Any environmental tobacco smoke exposure (%) | Not available | 65.4% | 37.5% | 43.6% | Not available |
| High alcohol consumption\* (%) | 48.1% | 62.6% | 22.1% | 44.4% | 38.5% |
| Low education† (%) | 23.8% | 12.0% | 7.6% | 7.9% | 24.6% |
| Employed (%) | 93.3% | 43.8% | 51.6% | 68.6% | 73.7% |
| Type 2 diabetes mellitus (%) | 0.0% | 3.9% | 6.0% | 1.9% | 7.8% |
| Coronary heart disease ‡ (%) | 0.2% | 4.2% | 4.3% | 4.0% | 0.7% |

Abbreviations: SD = standard deviation

\* *More than 6 drinks/week*

*† Primary school or less.*

*‡ Defined as personal history of myocardial infarction or angina pectoris.*

**Table S2.** Description of baseline characteristics of cohorts, included in the analysis of incident self-reported hypertension. Missing values for exposure, prevalent hypertension and blood pressure lowering medication intake, and covariates excluded.

| Parameter | HUBRO | SDPP | SNAC-K | DCH | HNR | KORA | REGICOR |
| --- | --- | --- | --- | --- | --- | --- | --- |
| N | 4,462 | 4,211 | 1,094 | 24,181 | 2,205 | 3,402 | 1,337 |
| Systolic blood pressure (mmHg; mean ± SD) | 121.6 ± 9.7 | 116.6 ± 10.1 | 138.8 ± 18.6 | 136.8 ± 18.8 | 127.1 ± 18.4 | 123.6 ± 16.0 | 119.3 ± 15.3 |
| Diastolic blood pressure (mmHg; mean ± SD) | 71.1 ± 8.3 | 73.4 ± 7.2 | 81.2 ± 10.0 | 81.7 ± 9.9 | 79.3 ± 10.0 | 78.1 ± 9.7 | 75.6 ± 9.1 |
| Measured hypertension at baseline (%) | 0.0%§ | 0.0%§ | 58.5% | 44.8% | 31.4% | 19.3% | 16.1% |
| Men (%) | 38.8% | 39.1% | 41.4% | 47.0% | 47.5% | 46.8% | 44.9% |
| Age (years; mean ± SD) | 44.6 ± 11.7 | 46.8 ± 5.0 | 69.8 ± 9.1 | 56.6 ± 4.3 | 58.1 ± 7.6 | 46.8 ± 12.4 | 52.8 ± 11.0 |
| Body mass index [kg/m²; mean ± SD) | 24.8 ± 3.6 | 25.0 ± 3.5 | 25.4 ± 3.6 | 25.6 ± 3.8 | 26.8 ± 4.0 | 26.1 ± 3.9 | 25.8 ± 3.8 |
| Area unemployment (%; mean ± SD) | 1.8 ± 0.8 | 21.3 ± 2.9 | 2.1 ± 0.2 | 2.3 ± 0.9 | 12.3 ± 3.4 | 27.5 ± 18.5 | 7.7 ± 2.8 |
| Current smoker (%) | 24.5% | 25.5% | 12.4% | 35.0% | 24.8% | 24.7% | 23.4% |
| Any environmental tobacco smoke exposure (%) | 22.4% | Not available | 66.1% | 81.4% | 36.9% | 43.2% | Not available |
| High alcohol consumption\* (%) | 6.7% | 48.1% | 63.6% | 62.9% | 23.0% | 46.7% | 40.2% |
| Low education† (%) | 11.6% | 23.8% | 17.3% | 28.0% | 8.6% | 8.3% | 26.6% |
| Employed (%) | 87.0% | 93.3% | 35.2% | 18.3% | 48.1% | 67.9% | 70.1% |
| Type 2 diabetes mellitus (%) | 1.6% | 0.0% | 5.1% | 1.3% | 8.0% | 1.7% | 8.7% |
| Coronary heart disease ‡ (%) | 0.8% | 0.2% | 3.8% | 2.4% | 6.2% | 3.3% | 1.4% |

Abbreviations: SD = standard deviation

\* *More than 6 drinks/week*

*† Primary school or less.*

*‡ Defined as personal history of myocardial infarction or angina pectoris.*

§ *The definition of measured hypertension at baseline was used to exclude prevalent cases in SDPP and HUBRO, because the self-reported hypertension at baseline was not available.*

**Table S3.** Cross-tabulation of incident self-reported and measured hypertension and of self-reported hypertension and blood pressure lowering medication in cohorts.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cohort** | **Incident self-reported hypertension** | **Incident measured hypertension** | | | | **Incident blood pressure lowering medication intake** | | | |
| *Yes (%)* | *No (%)* | *Agreement (%)* | *Total* | *Yes (%)* | *No (%)* | *Agreement (%)* | *Total* |
| HUBRO | *Yes (%)* | Not available |  |  |  | 208 (4.5%) | 206 (4.5%) |  |  |
|  | *No (%)* |  |  |  |  | 37 (0.8%) | 4,158 (90.2%) | 4,366 (94.7%) | 4,609 |
| SDPP | *Yes (%)* | 568 (13.2%) | 63 (1.5%) |  |  | 370 (8.5%) | 269 (6.2%) |  |  |
|  | *No (%)* | 1,202 (28.0%) | 2,466 (57.4%) | 3,034 (70.6%) | 4,299 | 13 (0.3%) | 3,714 (85.1%) | 3,727 (85.4%) | 4,366 |
| SNAC-K | *Yes (%)* | 53 (8.3%) | 1 (0.2%) |  |  | 319 (20.2%) | 21 (1.3%) |  |  |
|  | *No (%)* | 194 (30.2%) | 394 (61.4%) | 447 (69.6%) | 642 | 1 (0.1%) | 1,241 (78.4%) | 1,560 (98.6%) | 1,582 |
| DCH | *Yes (%)* | Not available |  |  |  | 2,270 (9.5%) | 0 (0%) |  |  |
|  | *No (%)* |  |  |  |  | 894 (3.7%) | 20,856 (86.8%) | 23126 (96.3%) | 24,020 |
| HNR | *Yes (%)* | 179 (11.3%) | 340 (21.4%) |  |  | 310 (14.4%) | 121 (5.6%) |  |  |
|  | *No (%)* | 39 (2.5%) | 1,033 64.9%) | 1,212 (76.2%) | 1,591 | 128 (5.9%) | 1,594 (74.0%) | 1,904 (88.4%) | 2,153 |
| KORA | *Yes (%)* | 308 (11.2%) | 213 (7.8%) |  |  | 407 (12.3%) | 472 (14.2%) |  |  |
|  | *No (%)* | 212 (7.7%) | 2,015 73.3%) | 2,323 (84.5%) | 2,748 | 105 (3.2%) | 2,332 (70.3%) | 2,460 (74.2%) | 3,316 |
| REGICOR | *Yes (%)* | 88 (6.3%) | 46 (3.3%) |  |  | 133 (8.2%) | 113 (7.0%) |  |  |
|  | *No (%)* | 174 (12.4%) | 1,092 78.0%) | 1,180 (84.3%) | 1,400 | 47 (2.9%) | 1,327 (81.9%) | 1,460 (90.1%) | 1,620 |

**Table S4.** Description of exposure in cohorts included in the analysis of measured incidence of hypertension [mean ± standard deviation (5–95 percentile range, if not indicated otherwise]. Missing values for exposure, prevalent hypertension and blood pressure lowering medication intake, and covariates excluded.

| Exposure | SDPP | SNAC-K | HNR | KORA | REGICOR |
| --- | --- | --- | --- | --- | --- |
| PM25 [µg/m³] | 6.6 ± 1.2 (4.5–8.5) | 7.9 ± 1.3 (5.7–10.2) | 18.4 ± 1.0 (16.7–20.2) | 13.6 ± 0.9 (12.5–15.2) | 15.0 ± 1.6 (12.2–17.7) |
| PMcoarse [µg/m³] | 6.2 ± 2.4 (0.7–8.6) | 8.6 ± 4.7 (0.9–18.3) | 10.1 ± 1.6 (7.9–12.4) | 6.2 ± 1.0 (4.8–8.2) | 15.2 ± 2.4 (12.7–20.2) |
| PM25abs [µg/m³] | 0.5 ± 0.1 (0.4–0.7) | 0.8 ± 0.2 (0.5–1.1) | 1.6 ± 0.4 (1.2–2.2) | 1.7 ± 0.2 (1.4–2.0) | 2.3 ± 0.7 (1.3–3.4) |
| PM10 [µg/m³] | 13.5 ± 3.2 (6.0–16.7) | 16.5 ± 6.0 (6.2–28.4) | 27.7 ± 1.8 (25.1–31.1) | 20.3 ± 2.4 (16.5–24.2) | 32.2 ± 4.0 (26.9–40.4) |
| NO2 [µg/m³] | 8.3 ± 1.6 (6.1–11.2) | 17.2 ± 4.9 (8.7–24.9) | 30.0 ± 5.0 (23.2–38.5) | 18.6 ± 3.8 (13.7–25.4) | 37.0 ± 13.0 (12.4–56.0) |
| NOx [µg/m³] | 14.2 ± 3.0 (11.8–19.5) | 33.6 ± 12.6 (15.4–59.3) | 50.1 ± 11.8 (33.1–71.4) | 32.3 ± 7.1 (23.7–45.5) | 65.9 ± 27.8 (21.7–112.2) |
| NO [µg/m³] | 5.9 ± 2.0 (3.6–8.9) | 16.3 ± 8.3 (5.2–35.4) | 20.1 ± 7.7 (8.9–34.3) | 13.7 ± 3.8 (9.0–20.7) | 28.9 ± 15.3 (8.2–57.6) |
| Traffic intensity at the nearest road  [10³ vehicles/day] | 0.8 ± 1.6 (0.5–2.5) | 3.6 ± 6.5 (0.5–23.0) | Not available | 1.5 ± 3.2 (0.5–7.5) | 4.6 ± 6.8 (0.2–21.0) |
| Traffic load on major road fragments within 100 m [106 vehicles×m/day] | 0.1 ± 0.4 (0.0–0.9) | 1.9 ± 2.4 (0.0–5.2) | 1.0 ± 2.3 (0.0–4.1) | 0.4 ± 1.0 (0.0–2.4) | 1.6 ± 2.3 (0.0–6.0) |
| Lden [dB], median (interquartile range) | Not available | 66.5 (9.0) | 51.9 (13.4) | 53.7 (8.1) | 66.6 (6.3) |

**Table S5.** Description of exposure in cohorts included in the analysis of self-reported incidence of hypertension [mean ± standard deviation (5–95 percentile range), if not indicated otherwise]. Missing values for exposure, prevalent hypertension and blood pressure lowering medication intake, and covariates excluded.

| Exposure | HUBRO | SDPP | SNAC-K | DCH | HNR | KORA | REGICOR |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PM25 [µg/m³] | 9.0 ± 1.3 (6.7–11.0) | 6.6 ± 1.2 (4.5–8.5) | 7.9 ± 1.3 (5.9–10.2) | 11.3 ± 0.9 (9.7–12.6) | 18.4 ± 1.1 (16.8–20.3) | 13.6 ± 0.9 (12.5–15.2) | 15.0 ± 1.7 (12.2–18.0) |
| PMcoarse [µg/m³] | 4.0 ± 2.0 (3.2–8.8) | 6.2 ± 2.4 (0.7–8.6) | 8.7 ± 4.8 (0.9–18.6) | 5.6 ± 1.0 (4.1–7.4) | 10.1 ± 1.6 (7.9–12.4) | 6.2 ± 1.0 (4.9–8.2) | 15.2 ± 2.4 (12.7–20.0) |
| PM25abs [µg/m³] | 1.2 ± 0.3 (0.8–1.7) | 0.5 ± 0.1 (0.4–0.7) | 0.8 ± 0.2 (0.5–1.1) | 1.1 ± 0.2 (0.8–1.5) | 1.6 ± 0.4 (1.2–2.2) | 1.7 ± 0.2 (1.4–2.0) | 2.3 ± 0.7 (1.2–3.4) |
| PM10 [µg/m³] | 13.7 ± 3.1 (9.3–19.1) | 13.5 ± 3.2 (6.0–16.7) | 16.6 ± 6.0 (6.2–28.8) | 17.0 ± 1.9 (13.9–20.3) | 27.8 ± 1.9 (25.2–31.4) | 20.3 ± 2.4 (16.5–24.2) | 32.3 ± 4.0 (26.7–40.4) |
| NO2 [µg/m³] | 20.5 ± 7.6 (10.9–35.5) | 8.3 ± 1.6 (6.1–11.2) | 17.4 ± 4.8 (8.9–25.3) | 16.0 ± 7.0 (8.0–29.8) | 30.2 ± 5.0 (23.4–38.6) | 18.5 ± 3.8 (13.7–25.4) | 37.0 ± 13.3 (12.0–56.2) |
| NOx [µg/m³] | 37.8 ± 14.6 (21.7–67.9) | 14.2 ± 3.0 (11.8–19.5) | 33.7 ± 12.4 (15.4–59.1) | 26.0 ± 18.3 (6.9–64.8) | 50.6 ± 11.8 (33.5–71.8) | 32.3 ± 7.1 (23.7–45.5) | 66.1 ± 28.3 (18.7–113.6) |
| NO [µg/m³] | 17.2 ± 8.1 (8.8–34.9) | 5.9 ± 2.0 (3.6–8.9) | 16.2 ± 8.2 (4.9–34.5) | 10.0 ± 11.6 (-1.1–36.2) | 20.4 ± 7.8 (9.1–34.2) | 13.7 ± 3.8 (8.9–20.7) | 29.1 ± 15.6 (6.6–58.4) |
| Traffic intensity at the nearest road  [10³ vehicles/day] | 2.4 ± 5.3 (0.5–10.0) | 0.8 ± 1.6 (0.5–2.5) | 3.6 ± 7.6 (0.5–23.0) | 2.8 ± 7.0 (0.2–16.0) | Not available | 1.5 ± 3.2 (0.5–7.8) | 4.8 ± 7.1 (0.2–22.0) |
| Traffic load on major road fragments within 100 m [106 vehicles×m/day] | 0.8 ± 1.8 (0.0–3.8) | 0.1 ± 0.4 (0.0–0.9) | 2.2 ± 3.2 (0.0–5.6) | 1.2 ± 2.3 (0.0–5.3) | 1.0 ± 2.3 (0.0–4.2) | 0.4 ± 1.0 (0.0–2.4) | 1.7 ± 2.3 (0.0–6.0) |
| Lden [dB] , median (interquartile range) | 55.3 (10.0) | Not available | 66.5 (9.0) | 57.6 (9.3) | 52.1 (14.0) | 53.7 (7.9) | 66.7 (6.1) |

**Table S6.** Correlation coefficient of exposures assigned to residential locations of all cohort participants, at baseline (Spearman’s ρ).

| Exposures | HUBRO | SDPP | SNAC-K | DCH | HNR | KORA | REGICOR |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PM2.5 × PM2.5abs. | 0.47 | 0.93 | 0.98 | 0.48 | 0.89 | 0.42 | 0.80 |
| PM2.5 × PMcoarse | 0.14 | 0.32 | 0.71 | 0.62 | 0.68 | 0.26 | 0.33 |
| PM2.5 × PM10 | 0.71 | 0.32 | 0.70 | 0.72 | 0.88 | 0.37 | 0.71 |
| PM2.5 × NO2 | 0.40 | 0.63 | 0.82 | 0.64 | 0.65 | 0.35 | 0.67 |
| PM2.5 × traffic load | 0.22 | 0.13 | 0.57 | 0.35 | 0.21 | 0.24 | 0.35 |
| PM2.5 × traffic noise | 0.30 | Not available | 0.61 | 0.30 | 0.30 | 0.35 | 0.66 |
| PM2.5abs. × PMcoarse | 0.21 | 0.42 | 0.79 | 0.60 | 0.73 | 0.83 | 0.25 |
| PM2.5abs. × PM10 | 0.21 | 0.41 | 0.78 | 0.69 | 0.90 | 0.66 | 0.78 |
| PM2.5abs. × NO2 | 0.78 | 0.79 | 0.85 | 0.71 | 0.63 | 0.66 | 0.90 |
| PM2.5abs. × traffic load | 0.34 | 0.21 | 0.59 | 0.50 | 0.41 | 0.43 | 0.39 |
| PM2.5abs. × traffic noise | 0.34 | Not available | 0.66 | 0.45 | 0.48 | 0.46 | 0.77 |
| PM10 × PMcoarse | 0.38 | 1.00 | 1.00 | 0.64 | 0.69 | 0.77 | 0.44 |
| PM10 × NO2 | 0.28 | 0.45 | 0.71 | 0.81 | 0.54 | 0.68 | 0.79 |
| PM10 × traffic load | 0.38 | 0.16 | 0.48 | 0.51 | 0.21 | 0.26 | 0.53 |
| PM10 × traffic noise | 0.29 | Not available | 0.58 | 0.43 | 0.31 | 0.29 | 0.72 |
| NO2 × traffic load | 0.47 | 0.23 | 0.50 | 0.65 | 0.54 | 0.36 | 0.37 |
| NO2 × traffic noise | 0.47 | Not available | 0.64 | 0.62 | 0.36 | 0.43 | 0.66 |
| Traffic load × traffic noise | 0.59 | Not available | 0.63 | 0.58 | 0.60 | 0.48 | 0.45 |

**Table S7.** Pooled estimates of association of air pollutants with incident self-reported hypertension in the subset of cohorts\* with available measured hypertension†. Estimates are adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

|  |  |  |  |
| --- | --- | --- | --- |
| **Exposure** | **Relative risk (95% confidence interval)** | **I2** | **pheterogeneity** |
| PM2.5 [5 µg/m³] | 1.24 (1.05, 1.46) | 0.00 | 0.98 |
| PMcoarse [5 µg/m³] | 1.05 (0.94, 1.16) | 30.76 | 0.22 |
| PM10 [10 µg/m³] | 1.03 (0.93, 1.15) | 0.00 | 0.62 |
| PM2.5 absorbance [10-5 m-1] | 1.17 (1.03, 1.33) | 0.00 | 0.73 |
| NO2 [10 µg/m³] | 1.05 (0.98, 1.13) | 0.00 | 0.91 |
| NOx [20 µg/m³] | 1.03 (0.95, 1.12) | 19.96 | 0.29 |
| Traffic load [4×106 vehicles×m/day] | 1.08 (1.01, 1.17) | 0.00 | 0.98 |
| Traffic intensity [5,000 vehicles/day] † | 1.00 (0.94, 1.07) | 45.81 | 0.14 |
| Lden [per 10 dB] ‡ | 1.03 (1.01, 1.06) | 0.00 | 0.90 |

*\* SNAC-K, SDPP, HNR, KORA, REGICOR; Npopulation under risk = 12,249; Nincident hypertension cases = 2,467.*

*† HNR excluded due to missing traffic intensity data.*

*‡ SDPP excluded due to missing noise data.*

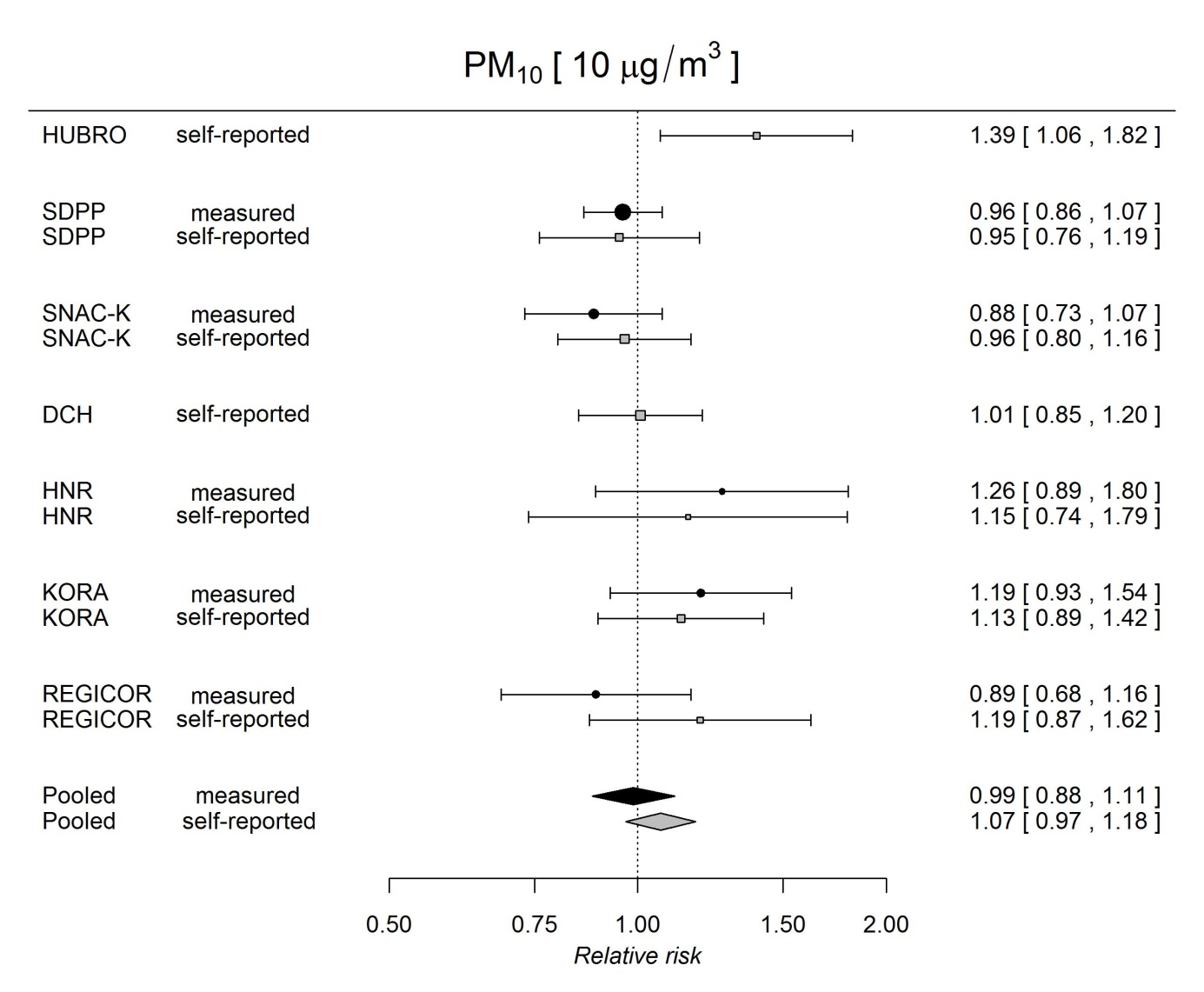
**Table S8.** Pooled estimates of the association of air pollution, traffic indicators and road traffic noise with alternative definitions of hypertension\*. Estimates are adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

| **Outcome and exposure** | **Relative risk (95% confidence interval)** | **I2** | **Pheterogeneity** |
| --- | --- | --- | --- |
| *Incident measured hypertension, low blood pressure cutoff (systolic BP ≥130 mmHg or diastolic BP ≥85 mmHg or current intake of BPLM).* |  |  |  |
| PM2.5 [5 µg/m³] | 1.01 (0.90, 1.14) | 4.11 | 0.38 |
| PMcoarse [5 µg/m³] | 1.02 (0.95, 1.10) | 25.91 | 0.25 |
| PM10 [10 µg/m³] | 1.04 (0.94, 1.16) | 23.48 | 0.26 |
| PM2.5 absorbance [10-5 m-1] | 1.06 (0.96, 1.18) | 0.00 | 0.55 |
| NO2 [10 µg/m³] | 1.00 (0.94, 1.07) | 0.00 | 0.88 |
| NOx [20 µg/m³] | 0.99 (0.94, 1.05) | 0.00 | 0.57 |
| Traffic load [4×106 vehicles×m/day] | 1.06 (0.94, 1.19) | 44.18 | 0.13 |
| Traffic intensity [5,000 vehicles/day] *†* | 0.99 (0.93, 1.04) | 25.20 | 0.26 |
| Lden [per 10 dB] *‡* | 1.01 (0.96, 1.06) | 0.00 | 0.79 |
| *Incident measured hypertension, high blood pressure cutoff (systolic BP ≥ 160 mmHg or diastolic BP ≥ 95 mmHg or current intake of BPLM)* |  |  |  |
| PM2.5 [5 µg/m³] | 1.09 (0.95, 1.26) | 0.00 | 0.81 |
| PMcoarse [5 µg/m³] | 1.02 (0.91, 1.14) | 48.81 | 0.10 |
| PM10 [10 µg/m³] | 0.99 (0.88, 1.12) | 25.90 | 0.25 |
| PM2.5 absorbance [10-5 m-1] | 1.08 (0.96, 1.20) | 0.00 | 0.50 |
| NO2 [10 µg/m³] | 1.02 (0.95, 1.08) | 0.00 | 0.52 |
| NOx [20 µg/m³] | 1.01 (0.95, 1.07) | 0.00 | 0.64 |
| Traffic load [4×106 vehicles×m/day] | 1.06 (0.98, 1.15) | 0.00 | 0.89 |
| Traffic intensity [5,000 vehicles/day] *†* | 0.96 (0.91, 1.01) | 0.00 | 0.90 |
| Lden [per 10 dB] *‡* | 0.99 (0.94, 1.05) | 0.00 | 0.42 |

*\* SNAC-K, SDPP, HNR, KORA, REGICOR; Npopulation under risk = 12,249; Nincident hypertension cases = 2,467.*

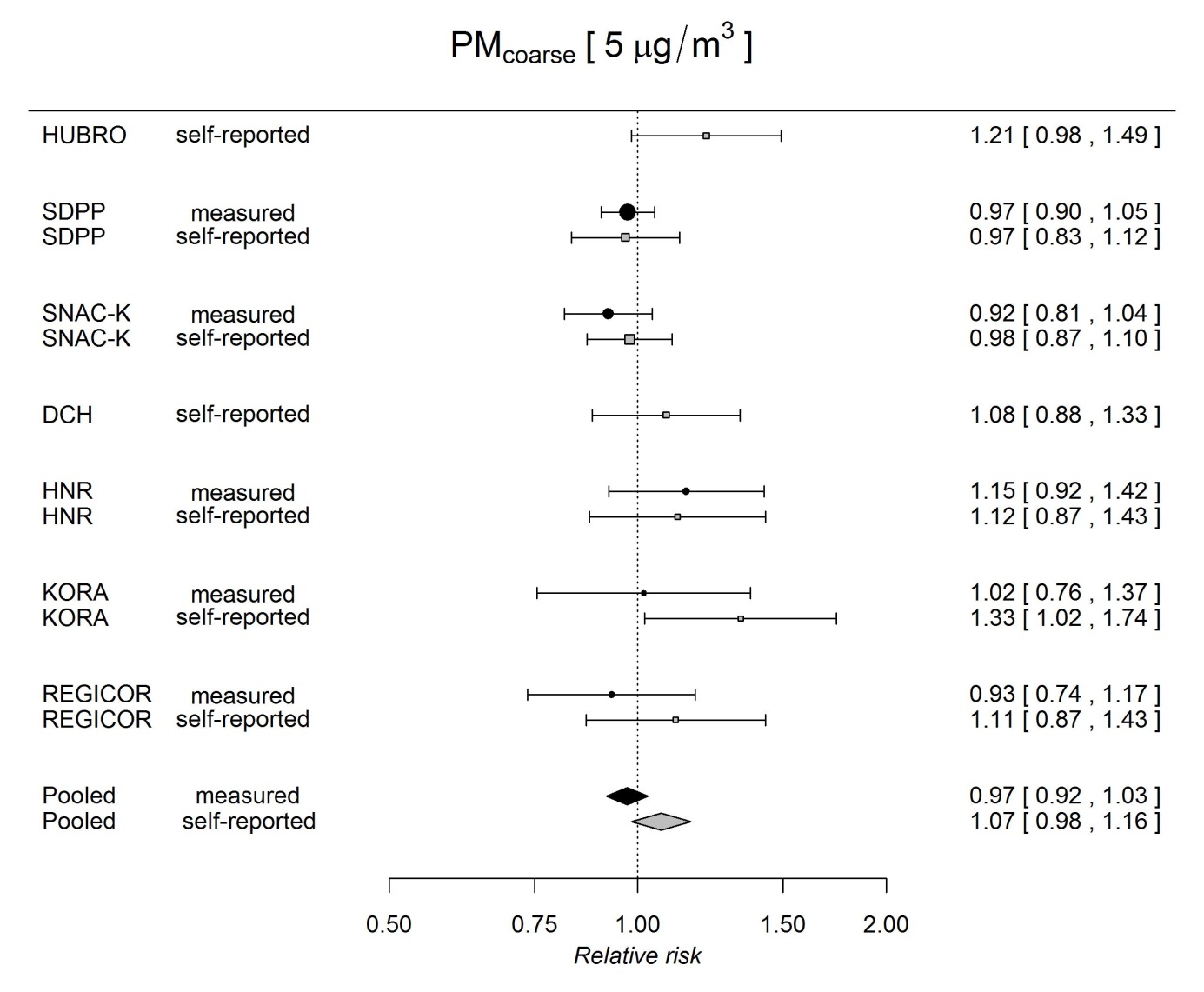
*† HNR excluded due to missing traffic intensity data.*

*‡ SDPP excluded due to missing noise data.*

**Figures**

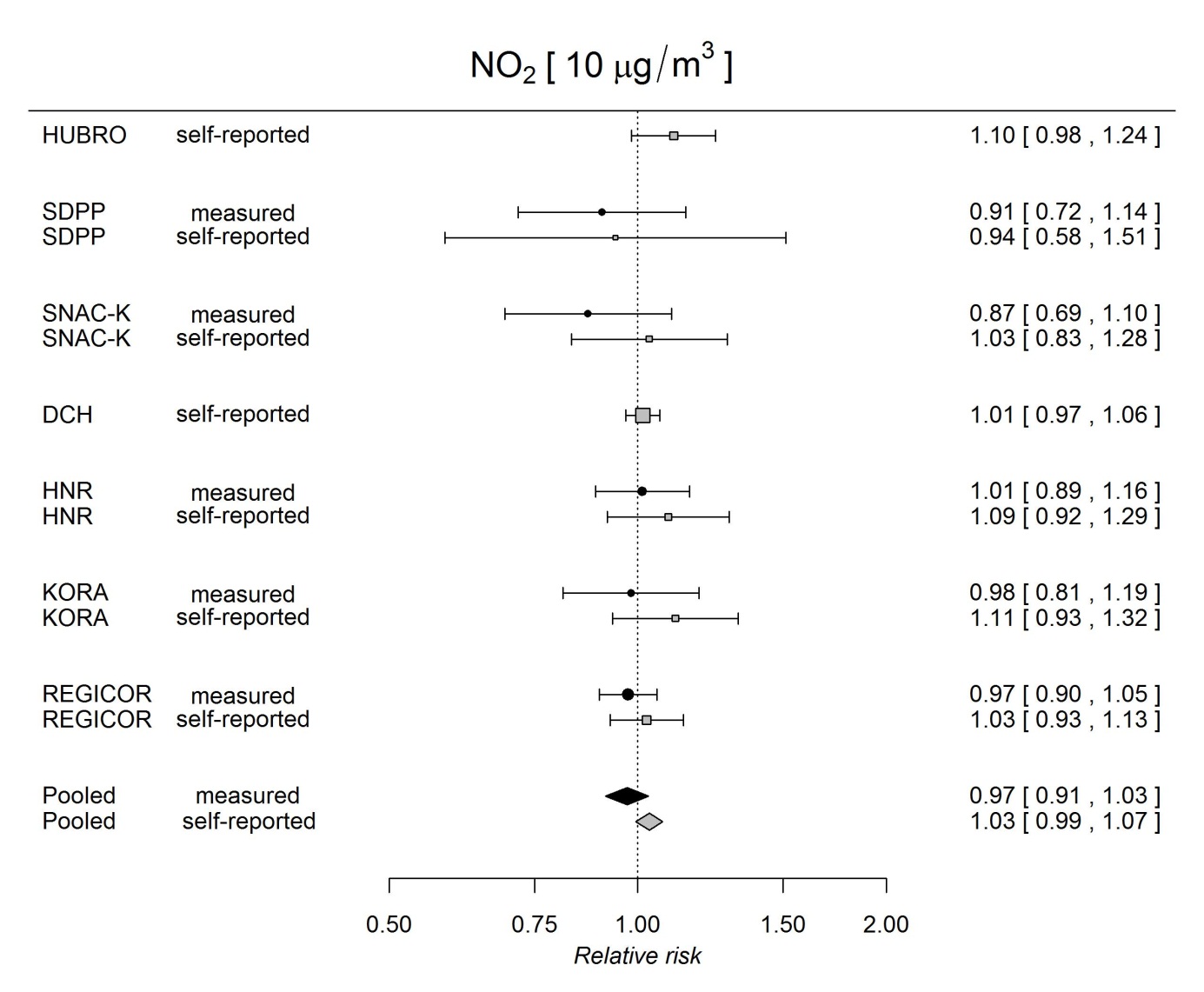
**Figure S1.** Random-effects meta-analysis of the association of PM10 at baseline with measured and self-reported incidence of hypertension at follow-up. Estimates adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

**Legend:** Filled marks = incident measured hypertension as outcome; open marks = incident self-reported hypertension. Relative risk (with 95% confidence interval) per given increase in exposure concentration is presented.

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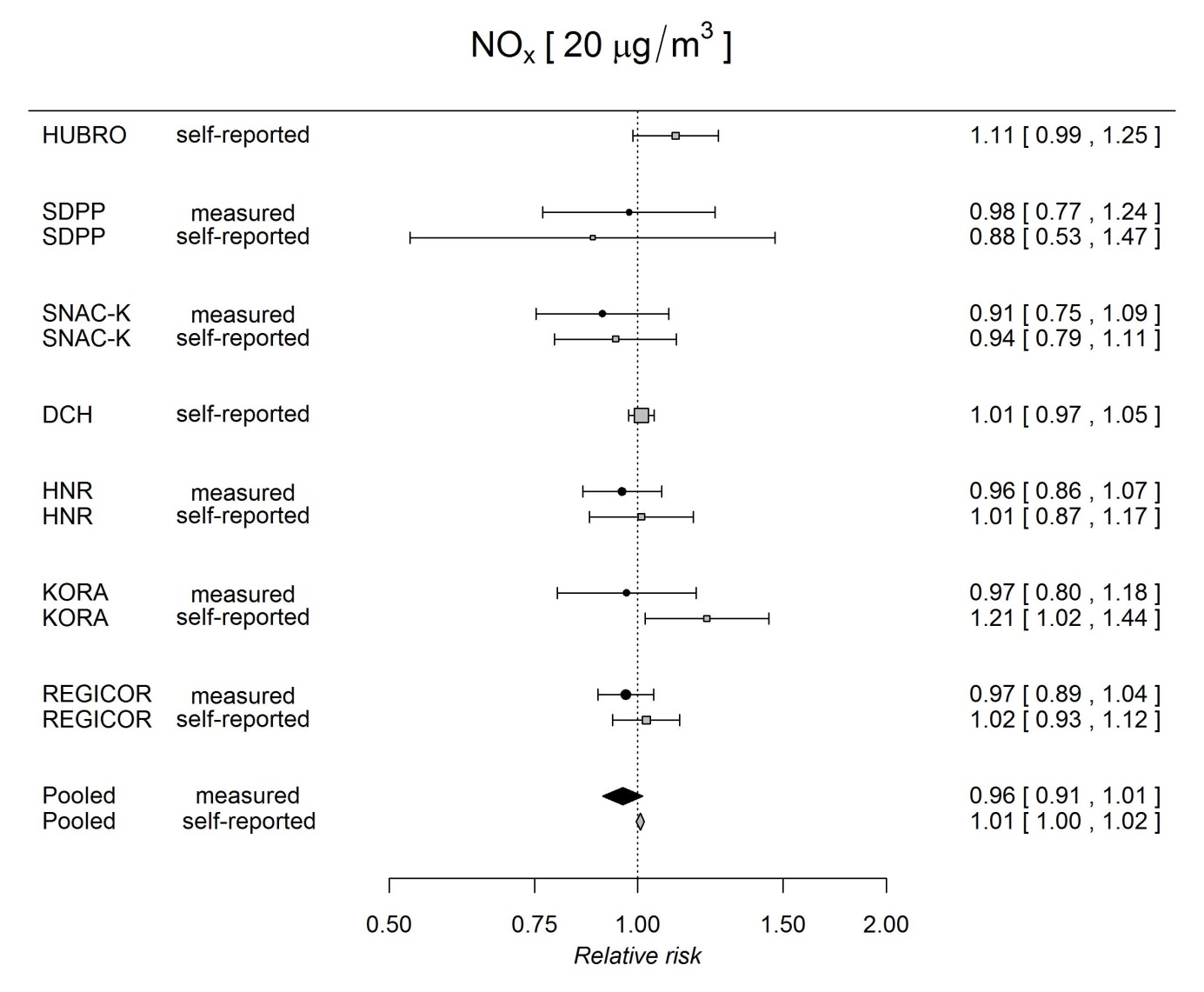
**Figure S2.** Random-effects meta-analysis of the association of PMcoarse at baseline with measured and self-reported incidence of hypertension at follow-up. Estimates adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

**Legend:** Filled marks = incident measured hypertension as outcome; open marks = incident self-reported hypertension. Relative risk (with 95% confidence interval) per given increase in exposure concentration is presented.

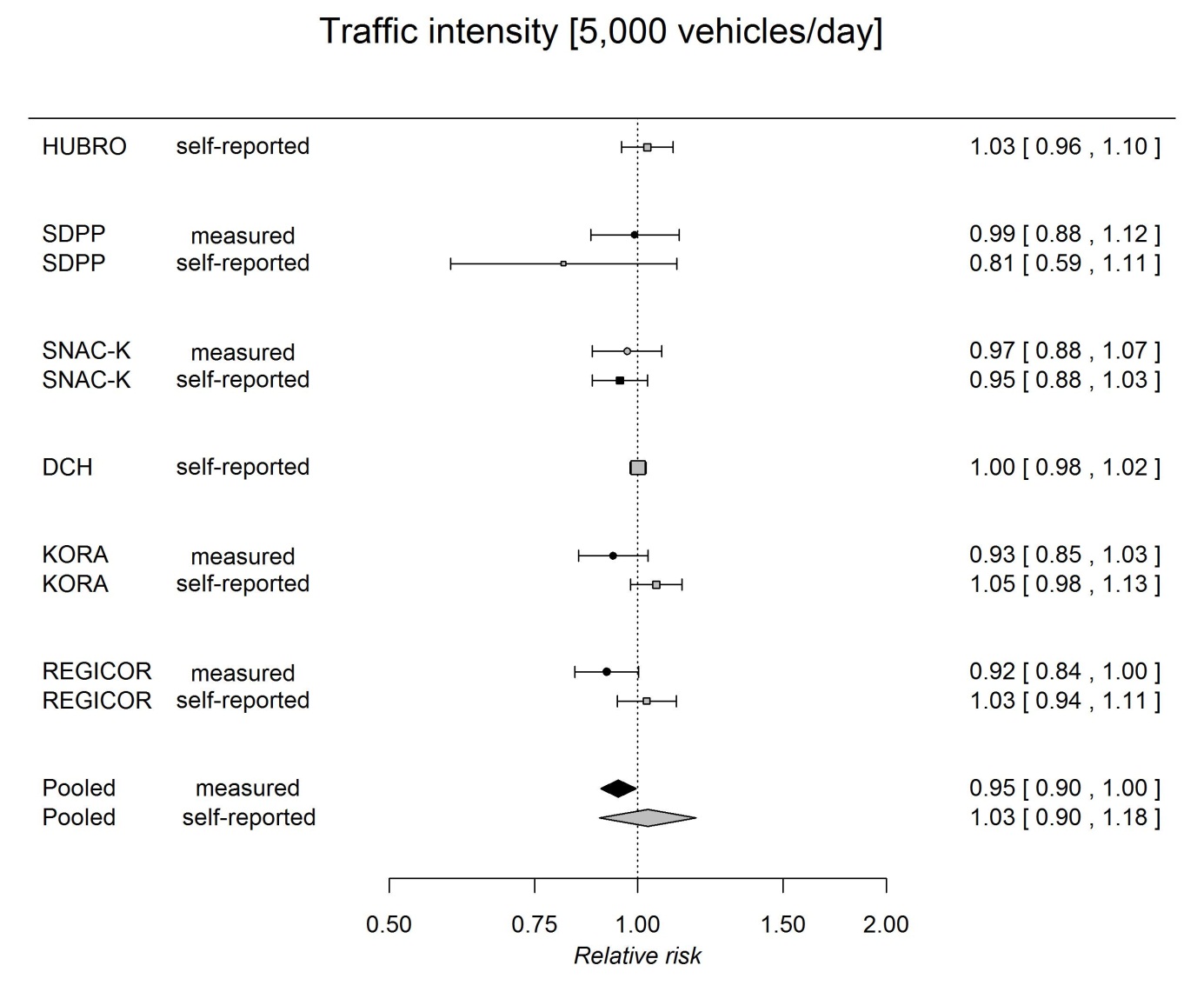


**Figure S3.** Random-effects meta-analysis of the association of NO2 at baseline with measured and self-reported incidence of hypertension at follow-up. Estimates adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

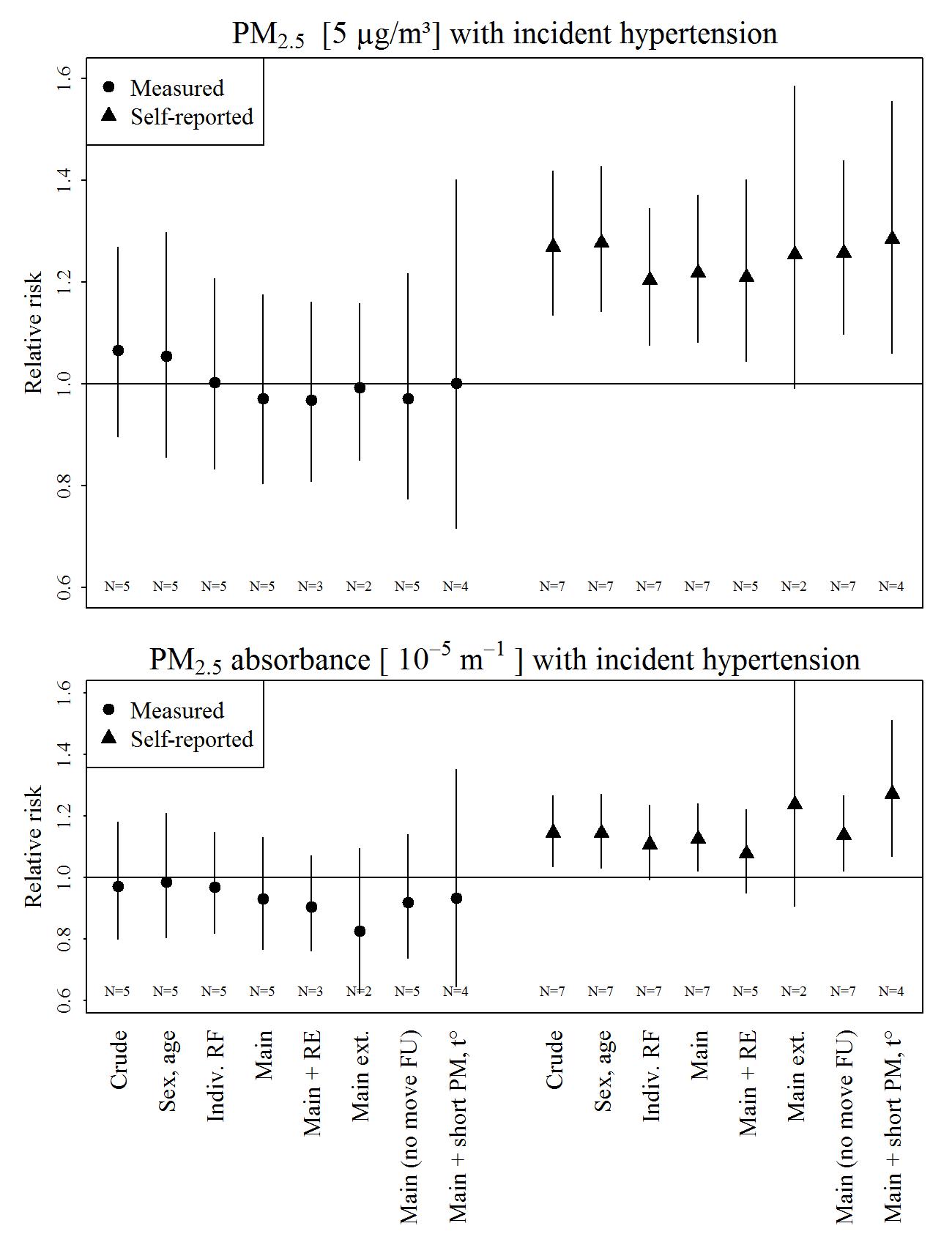
**Legend:** Filled marks = incident measured hypertension as outcome; open marks = incident self-reported hypertension. Relative risk (with 95% confidence interval) per given increase in exposure concentration is presented.

**Figure S4.** Random-effects meta-analysis of the association of NOx at baseline with measured and self-reported incidence of hypertension at follow-up. Estimates adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

**Legend:** Filled marks = incident measured hypertension as outcome; open marks = incident self-reported hypertension. Relative risk (with 95% confidence interval) per given increase in exposure concentration is presented.

**Figure S5.** Random-effects meta-analysis of the association of traffic intensity at the nearest road at baseline with measured and self-reported incidence of hypertension at follow-up. Estimates adjusted for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption, physical activity, family history of hypertension, and area-level socio-economic status.

**Legend:** Filled marks = incident measured hypertension as outcome; open marks = incident self-reported hypertension. Relative risk (with 95% confidence interval) per given increase in exposure concentration is presented.



**Figure S6.** Association of PM2.5 and PM2.5 absorbance with incident hypertension, using different model specifications /sensitivity analysis).

**Legend:** Measured = incident measured hypertension as outcome; self-report = incident self-reported hypertension as outcome. N = number of studies in the meta-analysis.

Adjustment models:  
Crude = only exposure in the model. Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.

Sex, age = adjusted for sex and age. Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.

Indiv. RF = adjusted for individual risk factors, namely, for age, sex, education, economic activity, body mass index, smoking status, pack-years of smoking, environmental tobacco smoking, total alcohol consumption, wine consumption (if available separately; in this case, wine was excluded from total alcohol consumption), physical activity, family history of hypertension (if available). Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.

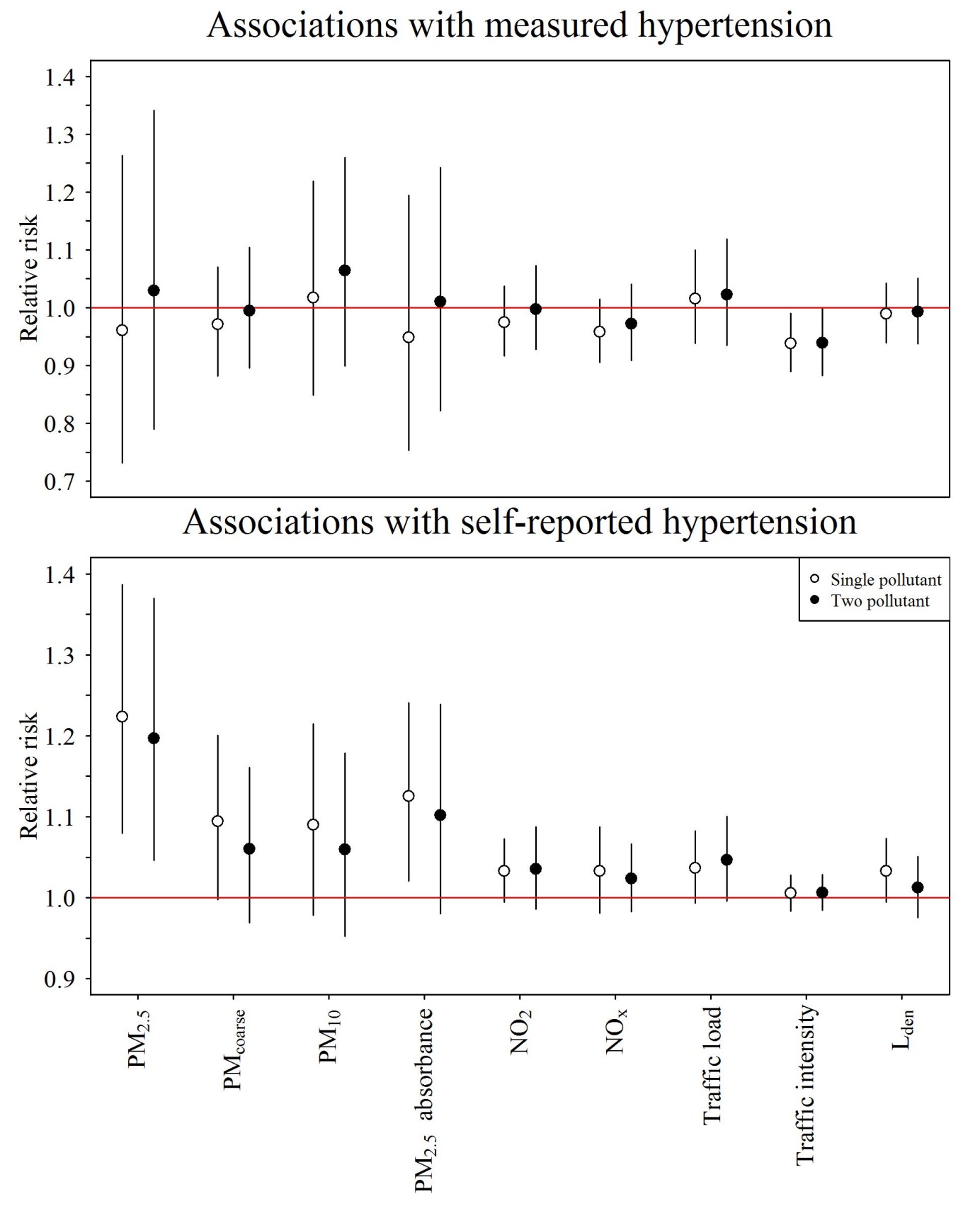
Main = adjusted for individual risk factors and area-level socio-economic status. Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.

Main + RE = main adjustment model with random intercept for area. Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, KORA, REGICOR.

Main ext. = main adjustment model, additionally adjusted for salt, fruit and vegetable consumption. Cohorts included with self-reported hypertension: SDPP, KORA. Cohorts included with measured hypertension: SDPP, KORA.

Main (no move FU) = main adjustment model, participants with address change during follow-up excluded. Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.

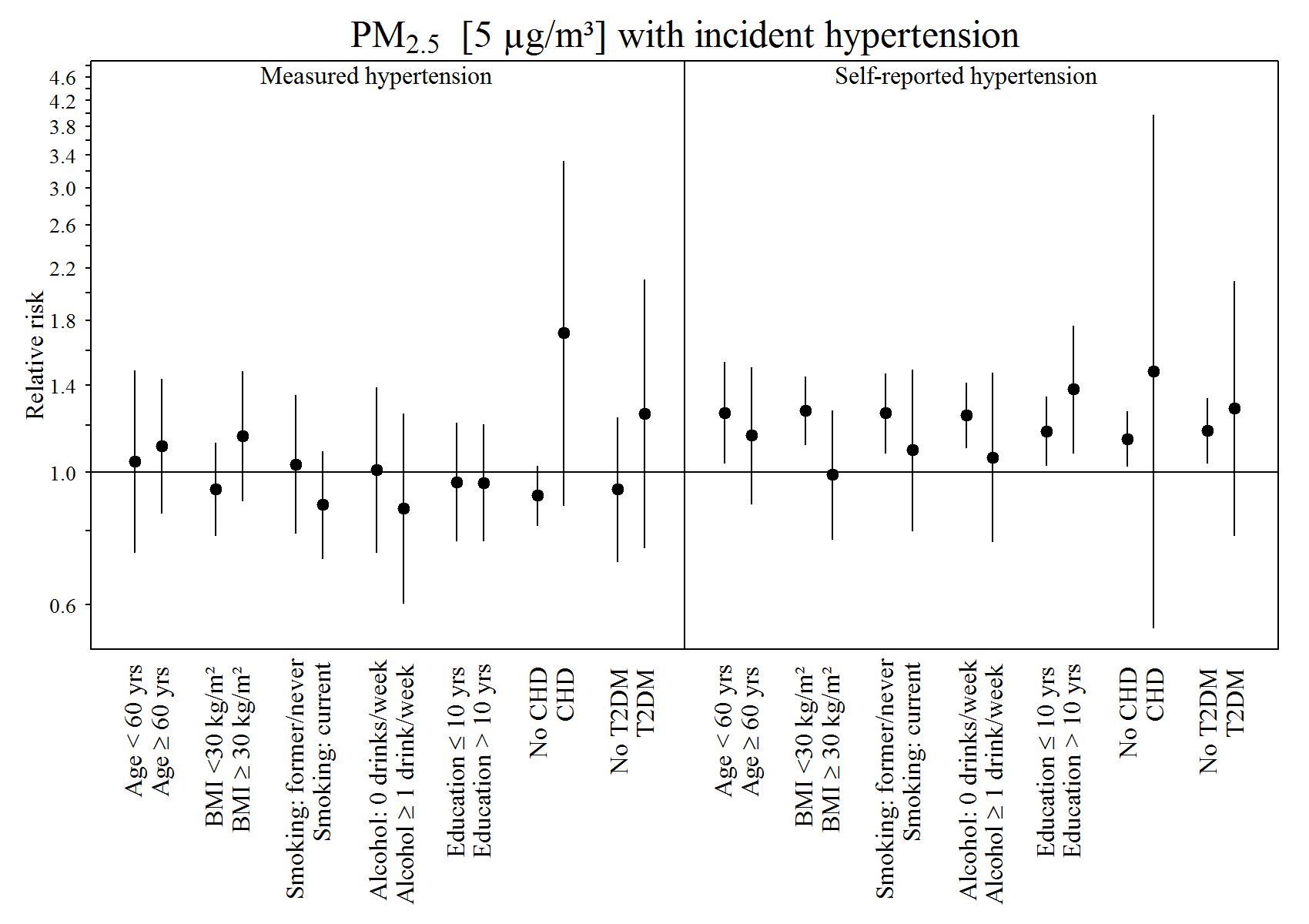
Main + short-term PM, t° = main model adjusted for short-term PM2.5 and ambient temperature (5-day mean). Cohorts included with self-reported hypertension: SDPP, SNAC-K, HNR, KORA. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA.



**Figure S7.** Meta-analysis estimates of the association of air pollution, traffic indicators and Lden with incident hypertension, analysed with single- and two-pollutant models.

**Legend:** Single pollutant = model with only one pollutant included (PM2.5, PMcoarse, PM10, PM2.5 absorbance, NO2, NOx, traffic indicators or Lden, respectively);

Two pollutant = adjusted for Lden (with PM2.5, PMcoarse, PM10, PM2.5 absorbance, NO2, NOx, or traffic indicators as main exposures) or for PM2.5 (with Lden as main exposure). Cohorts included with self-reported hypertension: HUBRO, DCH, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SNAC-K, HNR, KORA, REGICOR.



**Figure S8.** Meta-analysis estimates of the association of PM2.5 with incident hypertension (measured and self-reported), estimated in subgroups using product terms exposure×effect modifier.

**Legend:** BMI = body mass index; CHD = coronary heart disease; T2DM = type 2 diabetes mellitus.Cohorts included with self-reported hypertension: HUBRO, DCH, SDPP, SNAC-K, HNR, KORA, REGICOR. Cohorts included with measured hypertension: SDPP, SNAC-K, HNR, KORA, REGICOR.