SUPPLEMENTAL MATERIAL
| Section/topic | # | Checklist item                                                                                                                                                                                                                                                                                                                                 | Reported on page # |
|---------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| TITLE         |   |                                                                                                                                                                                                                                                                                                                                               |                   |
| Title         | 1 | Identify the report as a systematic review, meta-analysis, or both.                                                                                                                                                                                                                   | 1                 |
| ABSTRACT      |   |                                                                                                                                                                                                                                                                                                                                               |                   |
| Structured summary | 2 | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.                                                   | 2                 |
| INTRODUCTION  |   |                                                                                                                                                                                                                                                                                                                                               |                   |
| Rationale     | 3 | Describe the rationale for the review in the context of what is already known.                                                                                                                                                                                                     | 5                 |
| Objectives    | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).                                                                                                                                  | 5                 |
| METHODS       |   |                                                                                                                                                                                                                                                                                                                                               |                   |
| Protocol and registration | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.                                                                                                               | n/a               |
| Eligibility criteria | 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.                                                                                   | 6                 |
| Information sources | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.                                                                                                                                 | 7                 |
| Search        | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.                                                                                                                                                         | 6                 |
| Study selection | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).                                                                                                                                | 6-7               |
| Data collection process | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.                                                                                                                                 | 7                 |
| Data items    | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.                                                                                                                                                 | 7                 |
| Risk of bias in individual studies | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.                                                                                                           | 8                 |
| Summary measures | 13 | State the principal summary measures (e.g., risk ratio, difference in means).                                                                                                                                                                                                         | 7-8               |
| Section/topic                  | #  | Checklist item                                                                 | Reported on page # |
|-------------------------------|----|---------------------------------------------------------------------------------|--------------------|
| Risk of bias across studies   | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | 8                  |
| Additional analyses           | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | 8-9                |

### RESULTS

| Study selection               | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | 9                  |
| Study characteristics         | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | 9                  |
| Risk of bias within studies   | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | 10-11              |
| Results of individual studies | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | 10-11              |
| Synthesis of results          | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | 10-11              |
| Risk of bias across studies   | 22 | Present results of any assessment of risk of bias across studies (see Item 15). | 10-11              |
| Additional analysis           | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | 10-11              |

### DISCUSSION

| Summary of evidence           | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | 12-16              |
| Limitations                   | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | 17                 |
| Conclusions                   | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | 17                 |

### FUNDING

| Funding                       | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | 18                 |
| Database | Search strategies | Results |
|----------|------------------|---------|
| PubMed   | ("air pollution"[Mesh Terms] OR "air pollution"[All Fields]) OR ("particulate matter"[Mesh Terms] OR "particulate matter"[All Fields]) OR "particles"[All Fields] OR ("air pollutants"[Mesh Terms] OR "air pollutants"[All Fields]) OR "fine particulate" [All Fields] OR ("sulfur dioxide"[Mesh Terms] OR "sulfur dioxide"[All Fields]) OR ("sulfur oxide" [Mesh Terms] OR "sulfur oxide"[All Fields]) OR ("nitrogen dioxide"[Mesh Terms] OR "nitrogen dioxide"[All Fields]) OR ("nitrogen oxide"[Mesh Terms] OR "nitrogen oxide"[All Fields]) OR ("ozone"[Mesh Terms] OR "ozone"[All Fields]) OR ("carbon monoxide"[Mesh Terms] OR "carbon monoxide"[All Fields]) OR ("black carbon" [Mesh Terms] OR "black carbon"[All Fields]) OR "PM2.5"[All Fields] OR "PM10"[All Fields] OR "SO2"[All Fields] OR "SOX"[All Fields] OR "NO2"[All Fields] OR "NOX"[All Fields] OR "O3"[All Fields] OR "CO"[All Fields] OR "BC"[All Fields]) AND ("hypertension"[Mesh Terms] OR "hypertension"[All Fields]) OR "high blood pressure"[All Fields] OR hypertensive[All Fields] OR ("blood pressure"[Mesh Terms] OR "blood pressure"[All Fields]) OR "systolic blood pressure"[All Fields] OR "diastolic blood pressure"[All Fields] OR ("hypotension" [Mesh Terms] OR "hypotension"[All Fields]) OR "hypotensive"[All Fields] OR ("arterial pressure" [Mesh Terms] OR "arterial pressure"[All Fields]) OR ("arterial tension" [Mesh Terms] OR "arterial tension"[All Fields]) OR ("elevated blood pressure" [Mesh Terms] OR "elevated blood pressure"[All Fields]) AND ("child"[Mesh Terms] OR "child"[All Fields]) OR ("children"[Mesh Terms] OR "children"[All Fields]) OR "childhood"[All Fields] OR ("adolescent"[Mesh Terms] OR "adolescent"[All Fields]) OR ("teenager"[Mesh Terms] OR "teenager"[All Fields]) OR "kids"[All Fields]) | 19689 records |
| Embase   | ("air pollution"/exp OR 'air pollution' OR 'particulate matter'/exp OR 'particulate matter' OR 'particles' OR 'air pollutants'/exp OR 'fine particulate' OR 'sulfur dioxide'/exp OR 'sulfur dioxide' OR 'sulfur oxide'/exp OR 'sulfur oxide' OR 'nitrogen dioxide'/exp OR 'nitrogen dioxide' OR 'nitrogen oxide'/exp OR 'nitrogen oxide' OR 'ozone'/exp OR 'ozone' OR 'carbon monoxide'/exp OR 'carbon monoxide' OR 'black carbon'/exp OR 'black carbon' OR 'PM2.5' OR 'PM10' OR 'SO2' OR 'SOX' OR 'NO2' OR 'NOX' OR 'O3' OR 'CO' OR 'BC') AND ("hypertension"/exp OR hypertension OR 'high blood pressure'/exp OR 'high blood pressure' OR hypertensive OR 'blood pressure'/exp OR 'blood pressure' OR 'systolic blood pressure'/exp OR 'systolic blood pressure' OR 'diastolic blood pressure'/exp OR 'diastolic blood pressure' OR 'hypotension'/exp OR 'hypotension' OR | 14878 records |
'hypotensive' OR 'arterial pressure'/exp OR 'arterial pressure' OR 'arterial tension' OR 'arterial tension' OR 'elevated blood pressure' OR 'elevated blood pressure') AND ('child'/exp OR 'child' OR 'children'/exp OR 'children' OR 'childhood' OR 'adolescents'/exp OR 'adolescents' OR 'teenager'/exp OR 'teenager' OR 'kids')

Web of Science TS=('air pollution” OR "particulate matter" OR "particles" OR "air pollutants" OR "fine particulate" OR "sulfur dioxide" OR "sulfur oxide" OR "nitrogen dioxide" OR "nitrogen oxide" OR "ozone" OR "carbon monoxide" OR "black carbon" OR "PM$_{2.5}$" OR "PM$_{10}$" OR "SO$_2$" OR "SO$_X$" OR "NO$_2$" OR "NO$_X$" OR "O$_3$" OR "CO" OR "BC") AND TS=('hypertension' OR "high blood pressure" OR "hypertensive" OR "blood pressure" OR "systolic blood pressure" OR "diastolic blood pressure" OR "hypotension" OR "hypotensive" OR "arterial pressure" OR "arterial tension" OR "elevated blood pressure") AND TS=('child' OR "children" OR "childhood" OR "adolescents" OR "teenager" OR "kids")

2083 records

Table S3. Contextual details of included studies: exposure and blood pressure measurements and confounding factors.

| Author (Publication year) | Subjects | Pollutants | NO$_2$ | PM$_{2.5}$ | PM$_{10}$ | Exposure assessment method | Confounding factors |
|---------------------------|----------|------------|--------|------------|----------|----------------------------|--------------------|
| Zhang et al.(2020)$^{18}$ | Children from five schools in five districts of Guangzhou | PM$_{2.5}$ PM$_{10}$ | - | 39.00 | 61.10 | Monitoring stations and inverse distance weighting interpolation method | age, sex, weight status, humidity, breast, outdoor physical activity time, parental education, parental smoking status and family history of hypertension |
| Wu et al.(2020)$^{19}$   | Children from the Chinese Seven Northeast Cities (SNEC) Study | PM$_{2.5}$ | - | 54.16 | - | Monitoring station | age, sex, parental education, income, passive tobacco smoke exposure, |
| Study                          | Location                          | NO₂ | PM₂.₅ | PM₁₀ | Results                                    |
|-------------------------------|-----------------------------------|-----|-------|------|-------------------------------------------|
| Warembourg et al. (2019)²⁰    | Child from the HELIX (Human Early-Life Exposome) project | 22.10 | 13.50 | 25.60 | Land use regression or dispersion models |
| Ntarladima et al. (2019)²¹    | Children from the Wheezing Illnesses Study Leidsche Rijn (WHISTLER) | 29.40 | 16.70 | 25.00 | Land use regression model                  |
| Yang et al. (2019)⁹           | Children from the 2016 Health Promotion Program for Children and Adolescents (HPPCA) | -   | 45.70 | 76.20 | Monitoring station                        |

- home coal use, exercise time, and BMI.

- age, sex, height, maternal age, maternal education level, maternal pre-pregnancy body mass index, parity, parental country of birth and cohort

- sex, age, parental socio-economic status characteristics, exposed to smoke during pregnancy, child exposed to smoke later in life

- gender, age, body mass index, outdoor temperature, O₃
| Study                 | Population Description                                                                 | Air Quality Parameters | PM2.5 Mean | PM10 Mean | Methodology                                      | Control Variables                                                                 |
|----------------------|----------------------------------------------------------------------------------------|------------------------|------------|-----------|------------------------------------------------|----------------------------------------------------------------------------------|
| Zhang et al. (2019)  | Children and adolescents from seven provinces/municipalities (China)                   | PM2.5, PM10            | -          | 60.10     | Machine learning method with Random Forests model | Age, sex, height, body mass index, exercise, dietary, parental education, parental smoking, parental hypertension, region (south vs north), rurality (urban vs rural), annual average temperature and GDP per capita. |
| Li et al. (2018)     | Primary or middle school students from the 2010 Chinese National Survey on Students’ Constitution and Health (China) | PM10                   | -          | -         | Monitoring station                              | Effect of school, age, gender, height, weight of each child, GDP per capita, relative humidity in 2010 of each city, the spline term of temperature, NO2, SO2, children’s physical activity level. |
| Study                  | Participants                                                                 | Pollutant | Concentration Level | Exposure Factors                                                                 | Outlet                  | Measurements                                                                 |
|-----------------------|-------------------------------------------------------------------------------|-----------|---------------------|-----------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------|
| Zeng et al (2017)     | Children from the Chinese Seven Northeast Cities (SNEC) Study                 | PM$_{10}$ | -                   | Monitoring station temperature, age, sex, BMI, breast feeding, birth weight, etc. | PM$_{10}$              | 108.80                                                                     |
| Piters et al. (2015)  | Primary schools students from Health Effects of Air Pollution in Antwerp Schools (HEAPS) study | PM$_{2.5}$| 35.00               | Air pollution monitoring devices sex, age, height and weight of the child, etc.     | PM$_{10}$              | 24.00                                                                     |
Bilenko et al. (2015) Children from the Prevention and Incidence of Asthma and Mite Allergy (PIAMA) birth cohort study.

NO2 (short-term) PM2.5
13.3 7.8 (long-term) 1 (long-term) Land use regression model
1 (long-term) 11.1 (short-term)

1 (long-term) 1.1 (short-term) PM10

Land use regression model

sex, age, height, weight, age at birth, birthweight, size, gestational age, sex, age, height, and BMI, cuff.

during pregnancy, pneumonia, and otitis media during the first 2 years of life, ambient temperature, and temperature, and...
| Dong et al. (2014) 23 | Children from the Seven Northeastern Cities Chinese Children's Study (SNECCS) | NO$_2$ | 36.44 | - | 88.90 | Monitoring station | age, sex, BMI, parental education, low birth weight, premature birth, breast, income, passive smoking exposure, home coal use, exercise time, area residence per person, family history of hypertension, and district | room temperature |
| Study                          | Focus                                                                 | Exposure Parameters | Analysis Method | Cohort Characteristics |
|-------------------------------|-----------------------------------------------------------------------|---------------------|-----------------|------------------------|
| Liu et al. (2014)\(^{10}\)    | Children from the German Infant Nutritional Intervention plus environmental and genetic influences on allergy development study (GINIplus) | \(\text{NO}_2\) \(\text{PM}_{2.5}\) \(\text{PM}_{10}\) | Land use regression model | cohort study, area, gender, age of child, BMI, physical activity, maternal smoking during pregnancy, parental education level, parental history of hypertension, 7-day level of air pollutants, 7-day temperature |
| Baumgartner et al. (2012)\(^{24}\) | Children from villages in Yunnan, China | \(\text{PM}_{2.5}\) | Portable, battery-operated pump | sex, age, height, body mass index, passive smoking, socioeconomic status, salt intake, monosodium glutamate use, physical activity |
| Clark et al. (2012) | Children from the Road Traffic and Aircraft Noise Exposure and Children’s Cognition and Health (RANCH) project | NO$_2$ | 42.73 | - | - | Combined emission-dispersion and regression model | age, gender, employment status, crowding, home ownership, mother’s educational level, long-standing illness, main language spoken at home, parental support for schoolwork, body mass index, cuff-size, room temperature, birth weight, parental high blood pressure, and prematurity. |

Abbreviations: O$_3$, ozone; GDP, Gross Domestic Product; SES, socio-economic status; NO$_2$, nitrogen dioxide; SO$_2$, sulfur dioxide; BMI, body mass index. The levels of pollutants are present with mean/interquartile range: Pitters et al. (2015) and Bilenko et al. (2015) are present with interquartile range and the rest are present with mean.
### Table S4. Results of the sensitivity analysis for short-term exposure to PM$_{10}$ and change in DBP.

| Excluded article     | Estimated effect | 95% CI       | P   | $I^2$ | P of publication bias |
|----------------------|------------------|--------------|-----|-------|-----------------------|
| Yang et al. (2019)$^9$ | 0.051            | -0.506, 0.608 | 0.858 | 84.23% | 0.001                 |
| Zeng et al. (2017)$^7$ | 0.041            | -0.407, 0.49 | 0.857 | 76.15% | 0.007                 |
| Pieters et al. (2015)$^{11}$ | 0.327          | 0.16, 0.493  | <0.001 | 93.35% | 0.120                 |
| Bilenko et al. (2015)$^6$ | 0.358           | 0.229, 0.487 | <0.001 | 87.59% | 0.039                 |

### Table S5. Results of the sensitivity analysis for long-term exposure to PM$_{2.5}$ and change in SBP.

| Excluded article     | Estimated effect | 95% CI       | P   | $I^2$ | P of publication bias |
|----------------------|------------------|--------------|-----|-------|-----------------------|
| Zhang et al. (2020)$^{18}$ | 1.978            | 1.114, 2.841 | <0.001 | 0.00% | 0.850                 |
| Wu et al. (2020)$^{19}$ | 1.268            | 0.097, 2.439 | 0.03 | 0.00% | 0.702                 |
| Warembo et al. (2019)$^{20}$ | 1.826           | 0.951, 2.701 | <0.001 | 10.49% | 0.355                 |
| Ntarladima et al. (2019)$^{21}$ | 1.778         | 0.924, 2.631 | <0.001 | 5.90% | 0.177                 |
| Zhang et al. (2019)$^8$ | 2.003            | 0.946, 3.059 | <0.001 | 4.72% | 0.269                 |
| Bilenko et al. (2015)$^6$ | 1.84             | 0.988, 2.692 | <0.001 | 4.04% | 0.4787                |
| Liu et al. (2014)$^{10}$ | 1.786            | 0.925, 2.647 | <0.001 | 9.57% | 0.2525                |

### Table S6. Results of the sensitivity analysis for long-term exposure to PM$_{2.5}$ and change in DBP.

| Excluded article     | Estimated effect | 95% CI       | P   | $I^2$ | P of publication bias |
|----------------------|------------------|--------------|-----|-------|-----------------------|
| Zhang et al. (2020)$^{18}$ | 0.952            | 0.156, 1.748 | 0.0191 | 1.89% | 0.1128                |
| Wu et al. (2020)$^{19}$ | 1.041            | 0.069, 2.012 | 0.0357 | 0.20% | 0.1714                |
| Warembo et al. (2019)$^{20}$ | 0.835           | 0.037, 1.633 | 0.0404 | 0.00% | 0.2433                |
| Ntarladima et al. (2019)$^{21}$ | 0.867         | 0.087, 1.646 | 0.0293 | 0.00% | 0.4043                |
| Zhang et al. (2019)$^8$ | 1.048            | 0.017, 2.080 | 0.0464 | 0.62% | 0.1588                |
| Bilenko et al. (2015)$^6$ | 0.86             | 0.079, 1.641 | 0.0310 | 0.00% | 0.3735                |
| Liu et al. (2014)$^{10}$ | 1.002            | 0.209, 1.795 | 0.0133 | 0.00% | 0.0668                |

### Table S7. Results of the sensitivity analysis for long-term exposure to PM$_{10}$ and change in SBP.

| Excluded article     | Estimated effect | 95% CI       | P   | $I^2$ | P of publication bias |
|----------------------|------------------|--------------|-----|-------|-----------------------|
Table S8. Results of the sensitivity analysis for long-term exposure to PM$_{10}$ and change in DBP.

| Excluded article            | Estimated effect | 95%CI         | P     | I$^2$ | P of publication bias |
|-----------------------------|------------------|---------------|-------|-------|-----------------------|
| Zhang et al.(2020)$^{18}$   | 0.387            | 0.009,0.766   | 0.045 | 92.50%| 0.4827                |
| Waremboiurget al.(2019)$^{20}$| 0.359            | -0.027,0.744  | 0.068 | 92.60%| 0.6129                |
| Ntarladima et al.(2019)$^{21}$| 0.37             | 0.013,0.727   | 0.042 | 91.88%| 0.8301                |
| Zhang et al.(2019)$^{8}$    | 0.332            | -0.068,0.731  | 0.104 | 92.67%| 0.6291                |
| Li et al.(2018)$^{22}$      | 0.626            | 0.524,0.727   | 0.000 | 0.00% | 0.8247                |
| Bilenko et al.(2015)$^{6}$  | 0.366            | 0.008,0.725   | 0.045 | 91.91%| 0.7731                |
| Dong et al.(2014)$^{23}$    | 0.081            | 0.067,0.095   | 0.000 | 0.00% | 0.1672                |
| Liu et al.(2014)$^{10}$     | 0.435            | 0.068,0.802   | 0.020 | 91.91%| 0.2444                |

Table S9. Results of the sensitivity analysis for long-term exposure to NO$_2$ and change in SBP.

| Excluded article            | Estimated effect | 95%CI         | P     | I$^2$ | P of publication bias |
|-----------------------------|------------------|---------------|-------|-------|-----------------------|
| Waremboiurget al.(2019)$^{20}$| 0.436            | -0.156,1.028  | 0.1488| 53.14%| 0.897                 |
| Ntarladima et al.(2019)$^{21}$| 0.487            | -0.001,0.976  | 0.0506| 51.81%| 0.262                 |
| Bilenko et al.(2015)$^{6}$  | 0.824            | 0.603,1.045   | <0.001| 0.00% | 0.682                 |
| Dong et al.(2014)$^{23}$    | 0.228            | -0.251,0.707  | 0.3508| 0.00% | 0.311                 |
| Liu et al.(2014)$^{10}$     | 0.791            | 0.571,1.012   | <0.001| 42.48%| 0.866                 |
| Clark et al.(2012)$^{25}$   | 0.481            | -0.057,1.019  | 0.0796| 53.82%| 0.160                 |

Table S10. Results of the sensitivity analysis for long-term exposure to NO$_2$ and change in DBP.

| Excluded article            | Estimated effect | 95%CI         | P     | I$^2$ | P of publication bias |
|-----------------------------|------------------|---------------|-------|-------|-----------------------|
| Waremboiurget al.(2019)$^{20}$| 0.408            | -0.133,0.949  | 0.139 | 59.72%| 0.7251                |
| Air pollutant | design    | No. of estimates | Sample size | I² | P_egg | P   | Estimated effect (95%CI) |
|--------------|-----------|------------------|-------------|----|-------|-----|--------------------------|
| **NO₂**      | cross-sectional | 3                | 10363       | 0.00% | 0.874 | <0.001 | 0.880 (0.644, 1.115) |
|              | cohort    | 3                | 5045        | 8.56% | 0.141 | 0.5023 | 0.173 (-0.333, 0.680) |
| **PM₂.₅**    | cross-sectional | 4                | 61057       | 41.29% | 0.322 | <0.001 | 1.837 (0.940, 2.734) |
|              | cohort    | 3                | 5045        | 0.00% | 0.692 | 0.2284 | 1.575 (0.988, 4.134) |
| **PM₁₀**     | cross-sectional | 5                | 132820      | 96.55% | 0.2179 | 0.0439 | 0.575 (0.016, 1.135) |
|              | cohort    | 3                | 5045        | 0     | 0.9543 | 0.3376 | 0.466 (-0.487, 1.419) |

| Air pollutant | design    | No. of estimates | Sample size | I² | P_egg | P   | Estimated effect (95%CI) |
|--------------|-----------|------------------|-------------|----|-------|-----|--------------------------|
| **NO₂**      | cross-sectional | 3                | 10363       | 0.00% | 0.795 | <0.001 | 0.876 (0.660, 1.093) |
|              | cohort    | 3                | 5045        | 0.00% | 0.973 | 0.7873 | 0.066 (-0.412, 0.543) |
| **PM₂.₅**    | cross-sectional | 4                | 61057       | 0.00% | 0.304 | 0.0509 | 0.825 (-0.003, 1.653) |
|              | cohort    | 3                | 5045        | 26.01% | 0.392 | 0.1343 | 1.657 (-0.512, 3.825) |
| **PM₁₀**     | cross-sectional | 5                | 132820      | 94.88 | 0.398 | 0.0442 | 0.408 (0.011, 0.806) |
|              | cohort    | 3                | 5045        | 23.94 | 0.5719 | 0.6735 | 0.198 (-0.722, 1.117) |

| Age          | Male proportion | Study location |
|--------------|------------------|----------------|
| β(95%CI)     | P                | β(95%CI)       | P   | β(95%CI) | P   |
| **SBP**      |                  |                |      |          |      |
| NO₂          | -0.176 (-0.514, 0.162) | 0.308 | 0.066 (-0.148, 0.281) | 0.545 | -0.657 (-1.192, -0.122) | 0.016 |
Table S14. The results of multivariate meta-regression in the long-term exposure group.

|          | Age        | Male proportion | Study location |
|----------|------------|-----------------|----------------|
|          | β(95%CI)   | P               | β(95%CI)       | P               | β(95%CI)       | P               |
| SBP      |            |                 |                |                 |                 |                 |
| NO₂      | -0.266(-0.625,0.093) | 0.308 | -0.051(-0.293,0.192) | 0.683 | -0.800(-1.377,-0.223) | 0.007 |
| PM₂₅     | -0.481(-1.908,0.946)  | 0.912 | -0.695(-1.874,0.484)  | 0.248 | 0.197(-3.289,3.683)  | 0.912 |
| PM₁₀     | -0.693(-1.093,-0.293) | <0.001 | -0.493(-1.109,0.122)  | 0.116 | -0.562(-1.611,0.487) | 0.293 |
| PM₂₅     | -0.493(-1.855,0.869)  | 0.333 | -0.343(-1.442,0.755)  | 0.540 | 0.856(-1.920,3.633)  | 0.546 |
| PM₁₀     | -0.536(-0.887,-0.185) | <0.001 | -0.309(-0.849,0.231)  | 0.262 | -0.785(-1.796,0.226) | 0.128 |
| DBP      |            |                 |                |                 |                 |                 |
| NO₂      | -0.088(-0.406,0.231)  | 0.479 | -0.044(-0.240,0.152)  | 0.663 | -0.860(-1.372,-0.348) | 0.001 |
| PM₂₅     | -0.493(-1.855,0.869)  | 0.333 | -0.343(-1.442,0.755)  | 0.540 | 0.856(-1.920,3.633)  | 0.546 |
| PM₁₀     | -0.536(-0.887,-0.185) | <0.001 | -0.309(-0.849,0.231)  | 0.262 | -0.785(-1.796,0.226) | 0.128 |
**Figure S1.** Forest plot for the association between short-term exposure to PM$_{10}$ (per 10 μg/m$^3$ increment) and SBP (mmHg). The blue boxes represent estimated effects of included studies. The blue horizontal bars represent 95% CIs of the estimated effects. The green box represents the pooled mean estimated effect. CI indicates confidence interval.

**Figure S2.** Forest plot for the association between short-term exposure to PM$_{2.5}$ (per 10 μg/m$^3$ increment) and DBP (mmHg).

**Figure S3.** Forest plot for the association between short-term exposure to PM$_{10}$ (per 10 μg/m$^3$ increment) and DBP (mmHg).
Figure S4. Funnel plot analysis in the meta-analysis of the association between short-term exposure to PM$_{10}$ and SBP. The x-coordinate is the estimated effect and the y-coordinate is the standard error of estimated effect. The two diagonal lines are the edges of the funnel plot. The black dots represent studies that were included in the meta-analysis. The study with small simple size is at the bottom of funnel plot, while the study with large sample is at the top of funnel plot.

Figure S5. Funnel plot analysis in the meta-analysis of the association between short-term exposure to PM$_{2.5}$ and DBP.
**Figure S6.** Funnel plot analysis in the meta-analysis of the association between short-term exposure to PM$_{10}$ and DBP.

**Figure S7.** Forest plot for the association between long-term exposure to PM$_{2.5}$ (per 10 μg/m$^3$ increment) and SBP (mmHg).
**Figure S8.** Forest plot for the association between long-term exposure to PM$_{10}$ (per 10 μg/m$^3$ increment) and SBP (mmHg).

**Figure S9.** Forest plot for the association between long-term exposure to NO$_2$ (per 10 μg/m$^3$ increment) and SBP (mmHg).

**Figure S10.** Forest plot for the association between long-term exposure to PM$_{2.5}$ (per 10 μg/m$^3$ increment) and DBP (mmHg).
Figure S11. Forest plot for the association between long-term exposure to PM$_{10}$ (per 10 μg/m$^3$ increment) and DBP (mmHg).

![Forest plot for PM$_{10}$ association](image1)

Figure S12. Forest plot for the association between long-term exposure to NO$_2$ (per 10 μg/m$^3$ increment) and DBP (mmHg).

![Forest plot for NO$_2$ association](image2)
**Figure S13.** Funnel plot analysis in the meta-analysis of the association between long-term exposure to PM$_{2.5}$ and SBP.

**Figure S14.** Funnel plot analysis in the meta-analysis of the association between long-term exposure to PM$_{2.5}$ and DBP.
**Figure S15.** Funnel plot analysis in the meta-analysis of the association between long-term exposure to PM$_{10}$ and SBP.

**Figure S16.** Funnel plot analysis in the meta-analysis of the association between long-term exposure to PM$_{10}$ and DBP.
Figure S17. Funnel plot analysis in the meta-analysis of the association between long-term exposure to NO₂ and SBP.

Figure S18. Funnel plot analysis in the meta-analysis of the association between long-term exposure to NO₂ and DBP.