Particulate matter exposure and Attention-Deficit/Hyperactivity Disorder in children: A systematic review of epidemiological studies.

**Supplementary C.** Quality and risk of bias assessment for each study

The Newcastle-Ottawa scale (Wells G 2013) was adopted in this review to evaluate the quality of cohort and cross-sectional study respectively.

The Office of Health Assessment and Translation (OHAT) by the National Institutes of Environmental Health Sciences National Toxicology Program (NEHS-NTP) (OHAT 2015) and Navigation Guide by the University of California (Lamet al. 2016; Woodruff and Sutton 2014) was adopted to evaluate risk of bias for each included study.

**References**

* Wells G, S.B., O’Connell D, Peterson J, Welch V, Losos M, Tugwell P. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses. http://www.ohri.ca/programs/clinical\_epidemiology/oxford.asp; 2013
* Zhao, T., Markevych, I., Romanos, M., Nowak, D., & Heinrich, J. (2018). Ambient ozone exposure and mental health: A systematic review of epidemiological studies. Environmental research.
* OHAT. Handbook for Conducting Systematic Reviews. Office of Health Assessment and Translation (OHAT) Division of the National Toxicology Program National Institute of Environmental Health Sciences; 2015
* Woodruff, T.J.; Sutton, P. The Navigation Guide systematic review methodology: a rigorous and transparent method for translating environmental health science into better health outcomes. Environ Health Perspect 2014;122:1007-1014

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| **1.**  **Forns et al., 2018** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 3-10 years | | |
| Exposure | PM10, PM2.5, PMcoarse and PM2.5 absorbance. | | |
| Comparison | 29127 children followed up from 1992 through 2008 | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Cohort Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Assessment of outcome |  |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts |  |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably high |
| Confoundingbias | Low risk |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Low risk |
| Selective reporting bias | Low risk |
| Conflict of interest | Low risk |
| Other sources of bias | Probably low |

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| **2.**  **Markevych et al., 2018** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 10-14 | | |
| Exposure | PM10 | | |
| Comparison | 66,823 children followed up from 2000 through 2014 | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Assessment of outcome | **\*** |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts |  |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Low |
| Confoundingbias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **3.**  **Yorifuji et al., 2017** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 8 | | |
| Exposure | PM with aerodynamic diameter <7 μm | | |
| Comparison | 33,911 children followed up from 2001 through 2009 | | |
| Outcomes | attention problems queried by survey | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Assessment of outcome |  |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts |  |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably high |
| Confoundingbias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **4.** **Min et al., 2016** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 2-10 years | | |
| Exposure | PM10 | | |
| Comparison | 8936 children followed up from 2002 through 2012 | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder diagnosis | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*** |
| **Outcome** | | Ascertainment of outcome | **\*** |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts |  |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably low |
| Detection bias, outcome assessment | Low |
| Confounding bias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **5. Yorifuji et al., 2016** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 5.5 years | | |
| Exposure | PM with aerodynamic diameter <7 μm | | |
| Comparison | 27,527 children followed up from 2001 to 2008 | | |
| Outcomes | attention problems queried by survey | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study |  |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome |  |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably high |
| Confounding bias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Probably low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **6.** **Basagaña et al., 2016** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 7 – 10 years | | |
| Exposure | PM2.5 | | |
| Comparison | 2,618 children followed up from 2012 through 2013 | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome | **\*** |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably low |
| Confounding bias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **7.**  **Chiu et al., 2016** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 6 – 7 years | | |
| Exposure | PM2.5 | | |
| Comparison | 267 children followed up from 2002 through 2014 | | |
| Outcomes | attention and response inhibition | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study |  |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome | **\*** |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably low |
| Confounding bias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Probably low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **8. Saenen et al. 2016** | | | |
| Design | Cross-sectional study | | |
| Participants | Human, | | |
| Exposure | PM10, PM2.5 | | |
| Comparison | - | | |
| Outcomes | Stroop Test (selective attention domain) | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representativeness of the sample: | **\*** |
| Sample size |  |
| Non-respondents | **\*** |
| Ascertainment of the exposure (risk factor) | **\*** |
| **Comparability** | | Comparability of subjects in different outcome groups on the basis of design or analysis. Confounding factors controlled. | **\*\*** |
| **Outcome** | | Assessment of outcome | **\*** |
| Statistical test | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably low |
| Confoundingbias | Probably low |
| **Other criteria** | | Selection bias | Probably high |
| Attrition/exclusion bias | Low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **9.**  **Fuertes et al., 2016** | | | |
| Design | Cohort study | | |
| Participants | Human, aged | | |
| Exposure | PM10 mass, PM2.5 massand PM2.5 absorbance | | |
| Comparison | 4745 children | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome |  |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts |  |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably high |
| Confounding bias | Probably low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **10. Sunyer et al. 2015** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 7 – 10 years | | |
| Exposure | ultrafine particle number (UFP; 10-700 nm) | | |
| Comparison | 2,715 children | | |
| Outcomes | Inattentiveness (Hit Reaction Time Standard Error in milliseconds) | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure | **\*** |
| Demonstration that outcome of interest was not present at start of study |  |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome | **\*** |
| Was follow-up long enough for outcome to occur |  |
| Adequate of follow up of cohorts | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | High |
| Detection bias, outcome assessment | Probably low |
| Confoundingbias | Low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **11.** **Gong et al., 2014** | | | |
| Design | Cohort study | | |
| Participants | Human, aged 9 -12 years | | |
| Exposure | PM10 | | |
| Comparison | 3,426 children followed up from 1992 through 2000 | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representative of the exposed cohort | **\*** |
| Selection of the non-exposed cohort | **\*** |
| Ascertainment of exposure |  |
| Demonstration that outcome of interest was not present at start of study | **\*** |
| **Comparability** | | Comparability of cohorts on the basis of the design of analysis | **\*\*** |
| **Outcome** | | Ascertainment of outcome |  |
| Was follow-up long enough for outcome to occur | **\*** |
| Adequate of follow up of cohorts | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably low |
| Confounding bias | Low |
| **Other criteria** | | Selection bias | Probably low |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Probably low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

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| **12. Siddique et al. 2010** | | | |
| Design | Cross-sectional study | | |
| Participants | Human, aged 9 – 17 years | | |
| Exposure | PM10 | | |
| Comparison | 969 cases and 850 controls | | |
| Outcomes | Attention-Deficit/Hyperactivity Disorder diagnosis | | |
| **Quality Assessment** | | | |
| **Newcastle-Ottawa Quality Assessment Scale-Case Control Study** | | | **Author’s judgement** |
| **Selection** | | Representativeness of the sample | **\*** |
| Sample size |  |
| Non-respondents | **\*** |
| Ascertainment of the exposure (risk factor) | **\*** |
| **Comparability** | | Comparability of subjects in different outcome groups on the basis of design or analysis. Confounding factors controlled. | **\*\*** |
| **Outcome** | | Assessment of outcome | **\*** |
| Statistical test | **\*** |
| **Risk of Bias Assessment** | | | |
| **Bias Domain** | | | **Author’s judgement** |
| **Key criteria** | | Detection bias, exposure assessment | Probably high |
| Detection bias, outcome assessment | Probably low |
| Confoundingbias | Probably high |
| **Other criteria** | | Selection bias | Probably high |
| Attrition/exclusion bias | Probably low |
| Selective reporting bias | Low |
| Conflict of interest | Low |
| Other sources of bias | Probably low |

**NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE**

**COHORT STUDIES**

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability

**Selection**

1) Representativeness of the exposed cohort

a) truly representative of the average **children** in the community ****

b) somewhat representative of the average **children** in the community ****

c) selected group of users e.g. nurses, volunteers

d) no description of the derivation of the cohort

2) Selection of the non-exposed cohort

a) drawn from the same community as the exposed cohort ****

b) drawn from a different source

c) no description of the derivation of the non-exposed cohort

3) Ascertainment of exposure

a) secure record (e.g. surgical records) ****

b) structured interview ****

c) written self-report

d) no description

4) Demonstration that outcome of interest was not present at start of study

a) yes ****

b) no

**Comparability**

1) Comparability of cohorts on the basis of the design or analysis

a) study controls for **age, sex** (select the most important factor) ****

b) study controls for any additional factor **** (This criteria could be modified to indicate specific control for a second important factor.)

c) cohorts are not comparable on the basis of the design or analysis controlled for confounders

**Outcome**

1) Assessment of outcome

a) independent blind assessment ****

b) record linkage ****

c) self-report

d) no description

2) Was follow-up long enough for outcomes to occur

a) yes (select an adequate follow up period for outcome of interest) ****

b) no

3) Adequacy of follow up of cohorts

a) complete follow up - all subjects accounted for ****

b) subjects lost to follow up unlikely to introduce bias - small number lost - > **20** % follow up, or description provided of those lost) ****

c) follow up rate < **80** % and no description of those lost

d) no statement

Cohort Studies:

Very Good Studies: 8-9 points, Good Studies: 6-7 points, Satisfactory Studies: 4-5 points, Unsatisfactory Studies: 0 to 3 points

**NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE**

**CROSS-SECTIONAL STUDIES**

Note: This scale has been adapted from the Newcastle-Ottawa Quality Assessment Scale for cohort studies to provide quality assessment of cross sectional studies. A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Ascertainment of exposure and Comparability.

**Selection**

1) Representativeness of the sample

a) truly representative of the average in the target population. **** (all subjects or random sampling)

b) somewhat representative of the average in the target group. **** (non-random sampling)

c) selected group of users/convenience sample

d) no description of the derivation of the included subjects.

2) Selection of the non-exposed cohort

a) Justified and satisfactory (including sample size calculation). ****

b) Not justified.

c) No information provided

3) Non-respondents:

a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. ****

b) The response rate is unsatisfactory, or the comparability between respondents and non- respondents is unsatisfactory.

c) No description of the response rate or the characteristics of the responders and the non-responders.

4) Ascertainment of exposure

a) Validated measurement tool. ****

b) Non-validated measurement tool, but the tool is available or described. ****

c) No description of the measurement tool.

**Comparability**

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.

a) The study controls for the most important factor: age, sex ****

b) The study control for any additional factor. ****

**Outcome**

1) Assessment of outcome

a) independent blind assessment ****

b) record linkage ****

c) self-report ****

d) no description

2) Statistical test

a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). ****

b) The statistical test is not appropriate, not described or incomplete

Cross-sectional Studies:

Very Good Studies: 8-9 points, Good Studies: 6-7 points, Satisfactory Studies: 4-5 points, Unsatisfactory Studies: 0 to 3 points

**Criteria for the risk of bias assessment of each study, adapted from the OHAT and Navigation Guide tool**

Zhao, T., Markevych, I., Romanos, M., Nowak, D., & Heinrich, J. (2018). Ambient ozone exposure and mental health: A systematic review of epidemiological studies. Environmental research

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| **Bias** |  | **Risk of Bias Domains and Ratings** | **Answer** |
| **Key Criteria** | **Detection bias, exposure assessment** | Can we be confident in the exposure characterization?  List of major considerations:  1) air pollution measurements were performed daily, < 25% missing data  2) more than one monitoring station per a large geographical area  3) models were used for weighting | -LOW risk: There is high confidence that the exposure to PM is the true average population exposure.  -PROBABLY LOW: There is indirect evidence that suggests low risk of bias, or one of the three listed considerations is not applied.  -PROBABLY HIGH risk: There is insufficient information to permit a judgment of high risk of bias, but there is indirect evidence that suggests high risk of bias. Additionally, two out of the three listed considerations are not applied.  -HIGH risk: There is direct evidence of high risk of misclassification bias, or all three of the listed considerations are not applied. |
|  | **Detection bias, outcome assessment** | Can we be confident in the outcome assessment? | -LOW risk: Outcome was classified based on diagnosis standard criteria (International Classification System code) and provided by a national or regional database.  -PROBABLY LOW: Outcome was assessed based on diagnosis standard criteria and collected by researcher  -PROBABLY HIGH risk: Outcome was not assessed based on standard diagnosis criteria AND is accompanied by validation sub-study or sensitivity analysis to suggest that the risk is minimum.  -HIGH risk: Outcome was assessed based on self-reports (parents, family) and data collected by the researcher. |
|  | **Confounding bias** | Did the study design or analysis account for important confounding and modifying variables? | -LOW risk: Study accounted for all important confounders which were measured consistently  -PROBABLY LOW: Study accounted for most of confounders AND is not expected to introduce bias  -PROBABLY HIGH risk: Study accounted for some but not all of confounders AND is expected to introduce bias  -HIGH risk: Study did not account for potential confounders OR were inappropriately measured |
| **Other Criteria** | **Selection bias** | Did selection of study participants result in appropriate comparison groups? | -LOW risk: The descriptions of the studied population were sufficiently detailed to support the assertion that risk of selection effects was minimal.  -PROBABLY LOW risk: There is insufficient information about population selection to permit a judgment of low risk of bias, but there is indirect evidence that suggests low risk of bias.  -PROBABLY HIGH risk: There is insufficient information about population selection to permit a judgment of high risk of bias, but there is indirect evidence that suggests high risk of bias.  - HIGH risk: There were indications from descriptions of the studied population of high risk of bias. |
| **Attrition/exclusion bias** | Were outcome data complete without attrition or exclusion from analysis? | -LOW risk: There were no missing outcome data or missing data unrelated to true outcome  -PROBABLY LOW: There was insufficient information about incomplete data to judge for low risk, but indirect evidence that suggests low risk of bias  -PROBABLY HIGH risk: There was insufficient information about incomplete data to judge for high risk, but indirect evidence that suggests high risk  -HIGH risk: Missing outcome data is related to true outcome |
|  | **Selective reporting bias** | Were all measured outcomes reported? | -LOW risk: All of the studies pre-specified outcomes and findings are reported  -PROBABLY LOW: There was insufficient information about selective outcome to judge for low risk, but indirect evidence that suggests study was free of selective report  -PROBABLY HIGH risk: There was insufficient information about selective reporting to judge for high risk, but indirect evidence suggests that study was not free of selective reporting  -HIGH risk: Not all pre-specified outcomes and findings were reported, or one/more of the primary outcomes or analyses were assessed or executed with other methods than the pre-specified one, or one/more of the reported outcomes/findings was/were not pre-specified |
|  | **Conflict of interest** | Potential source of bias in reporting through source of funding | -LOW risk: The study did not receive funding from an entity with financial interest in the outcome of study  -PROBABLY LOW: There is insufficient information to judge for low risk, but indirect evidence suggests study was free of financial interest  -PROBABLY HIGH risk: There is insufficient information to judge for high risk, but indirect evidence suggests study was not free of financial interest  -HIGH risk: The study received support from an entity with financial interest in the outcome of study |
|  | **Other source of bias** | Bias due to other problems not covered elsewhere (statistical methods were appropriate and researchers adhere to the study protocol) | -LOW risk: No other sources of bias  -PROBABLY LOW: There is insufficient information to judge for low risk, but indirect evidence suggests study was free of other problems  -PROBABLY HIGH risk: There is insufficient information to judge for high risk, but indirect evidence suggests study was not free of other problems  -HIGH risk: There was at least one important risk of bias |