ADDITIONAL MATERIALS AVAILABLE ON THE HEI WEBSITE

Special Report 23

Systematic Review and Meta-analysis of Selected Health Effects of Long-Term Exposure to Traffic-Related Air Pollution

HEI Panel on the Health Effects of Long-Term Exposure to Traffic-Related Air Pollution

Chapter 10: Traffic-Related Air Pollution and Cardiometabolic Outcomes

Additional Materials 10.1 to 10.4

These Additional Materials were not formatted or edited by HEI. This document was part of the HEI Panel's review process.

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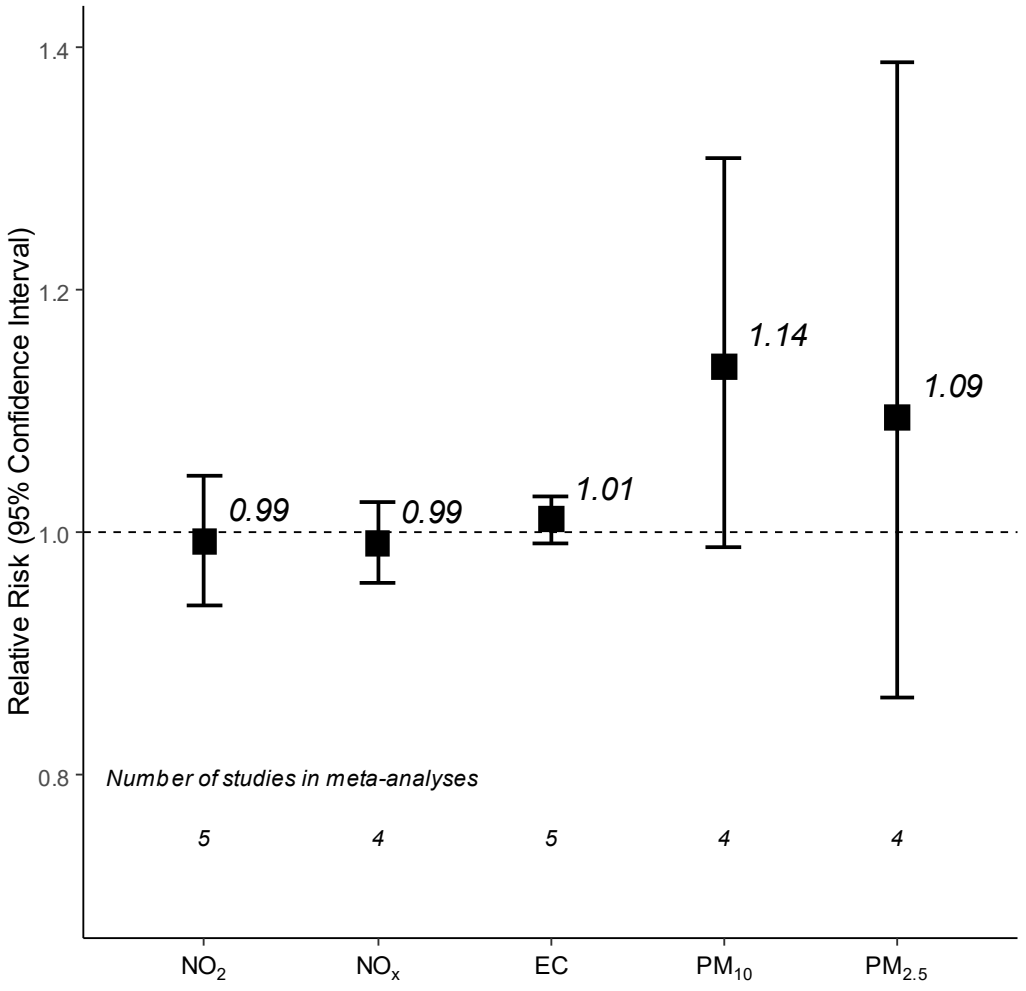
Chapter 10: Traffic-Related Air Pollution and Cardiometabolic Outcomes

Additional Materials: All Analyses

10.1 Ischemic heart disease

Summary of meta-analysis incidence

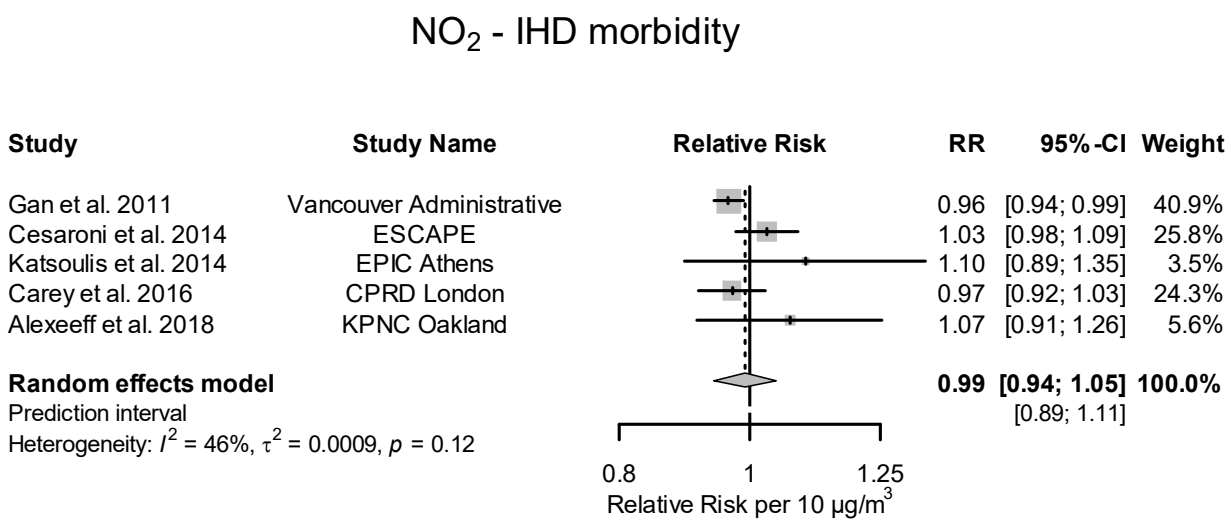


Footnote: The following increments were used: 10 µg/m^3 for NO_2, 20 µg/m^3 for NO_x, 1 µg/m^3 for EC, 10 µg/m^3 for PM_{10} and 5 µg/m^3 for $PM_{2.5}$. Effect estimates cannot be directly compared across the different traffic-related pollutants because the selected increments do not necessarily represent the same contrast in exposure.

All IHD studies are incidence studies unless indicated.

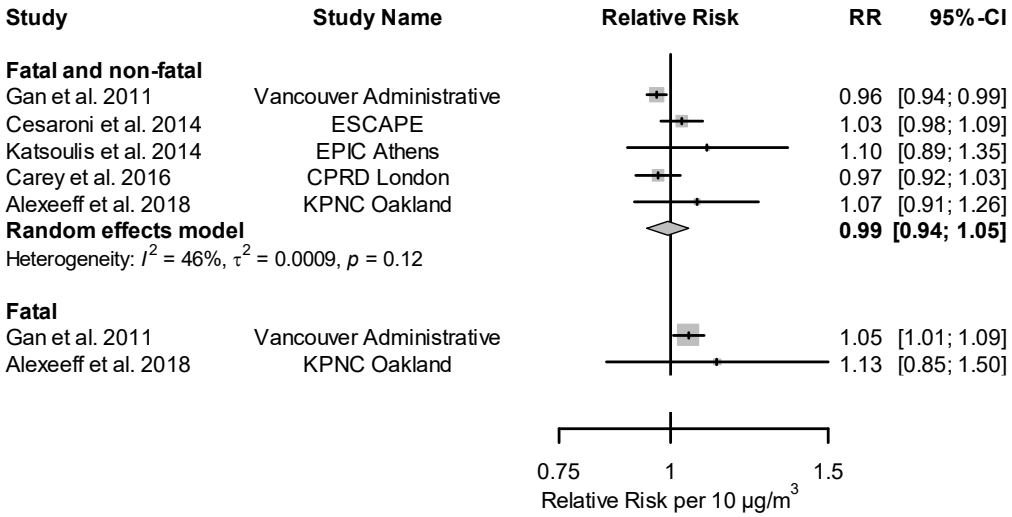
NO_2

Primary meta-analysis

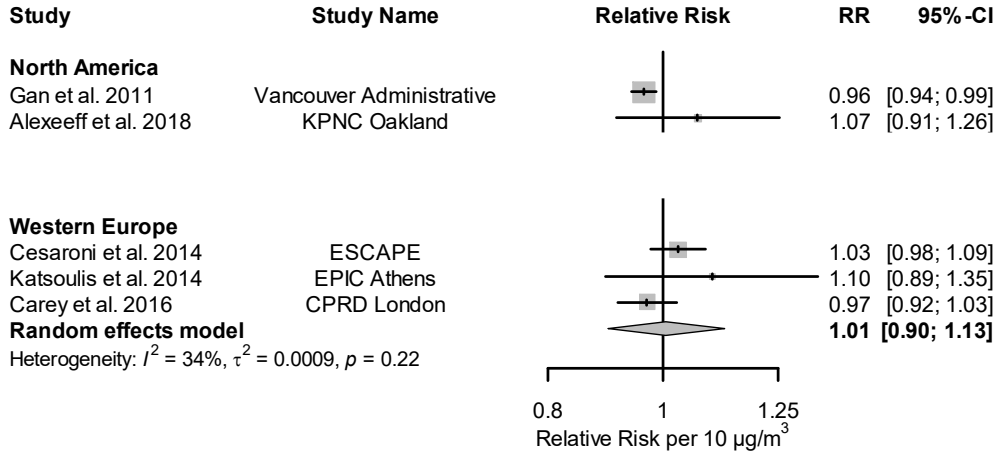


All fatal & non-fatal

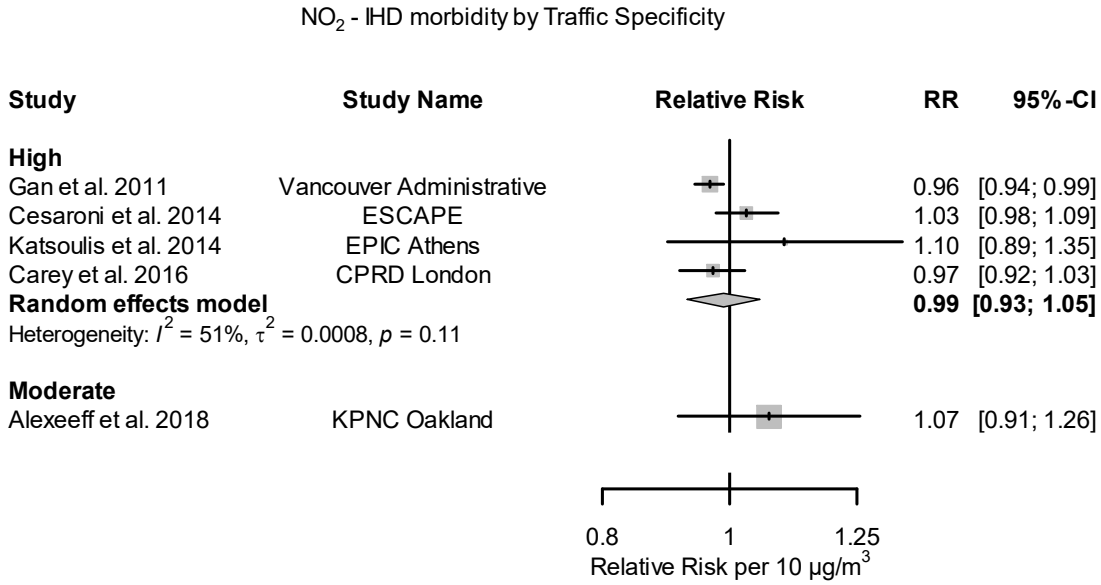
Sensitivity analysis including all available outcomes



Subgroup analysis - by region

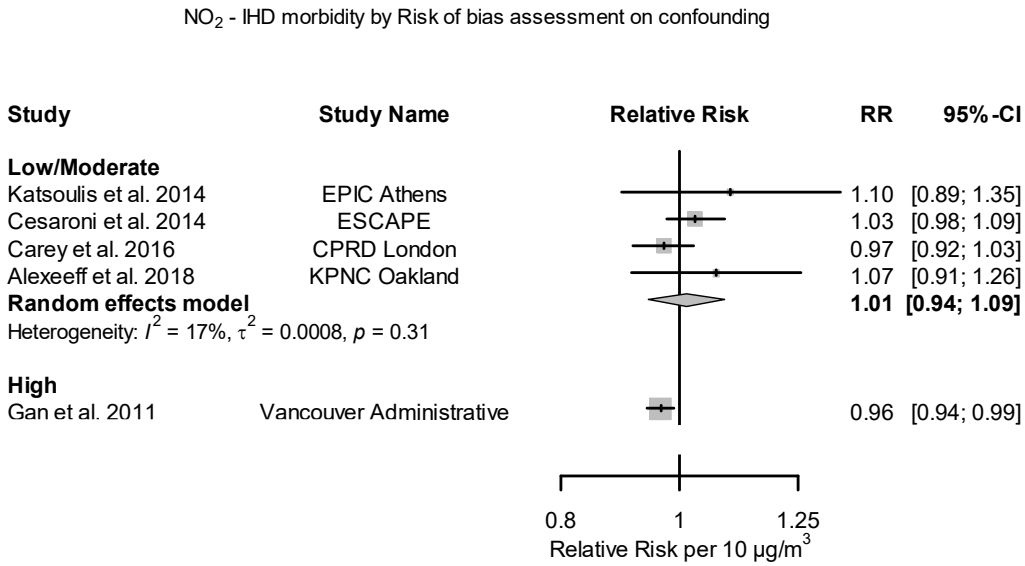


Subgroup analysis - by traffic specificity

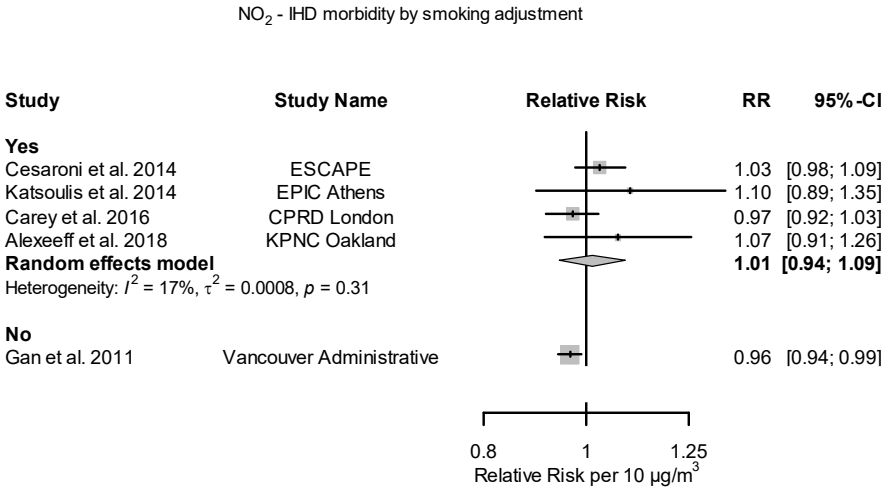


Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.

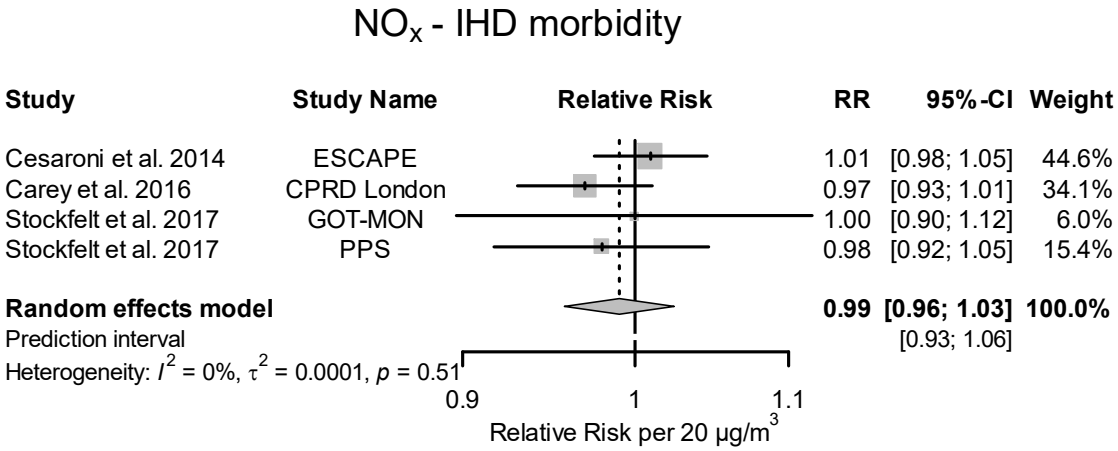


Subgroup analysis - by smoking adjustment



NO_x

Primary meta-analysis



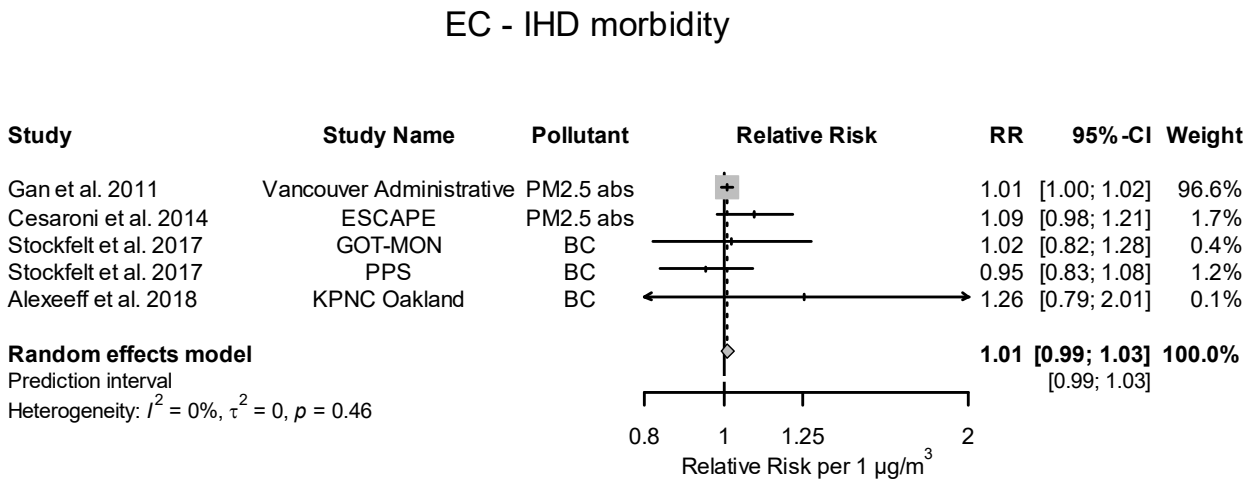
All fatal & non-fatal

Subgroup analysis notes:

All are W. European general population incidence studies after 2008 controlling for individual smoking, high in traffic specificity and low or moderate in risk of bias.

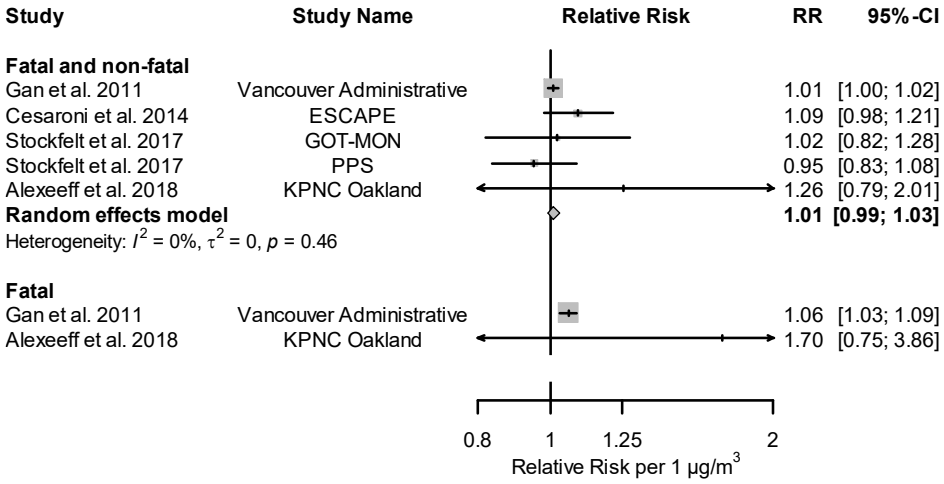
EC

Primary meta-analysis

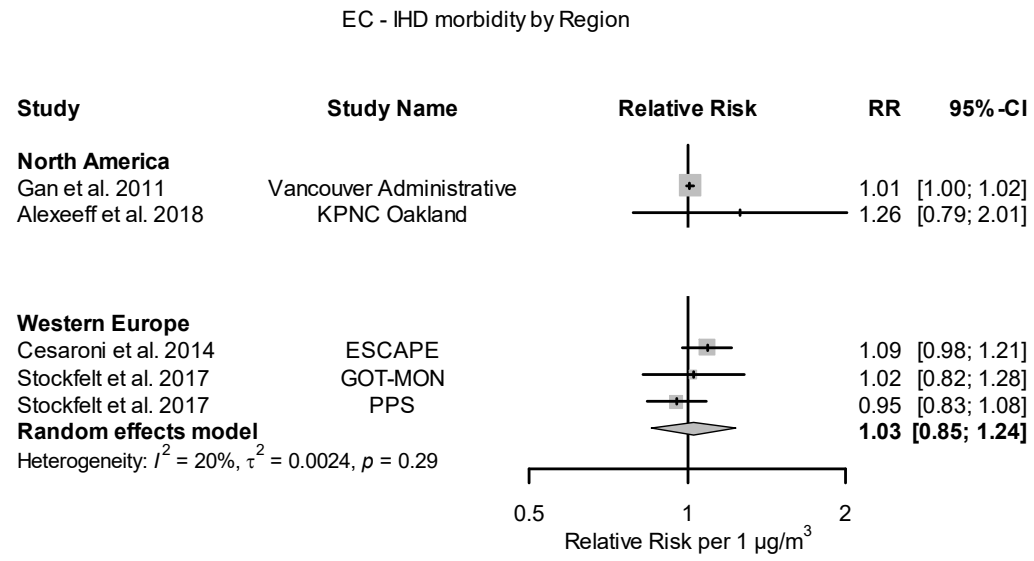


All fatal & non-fatal

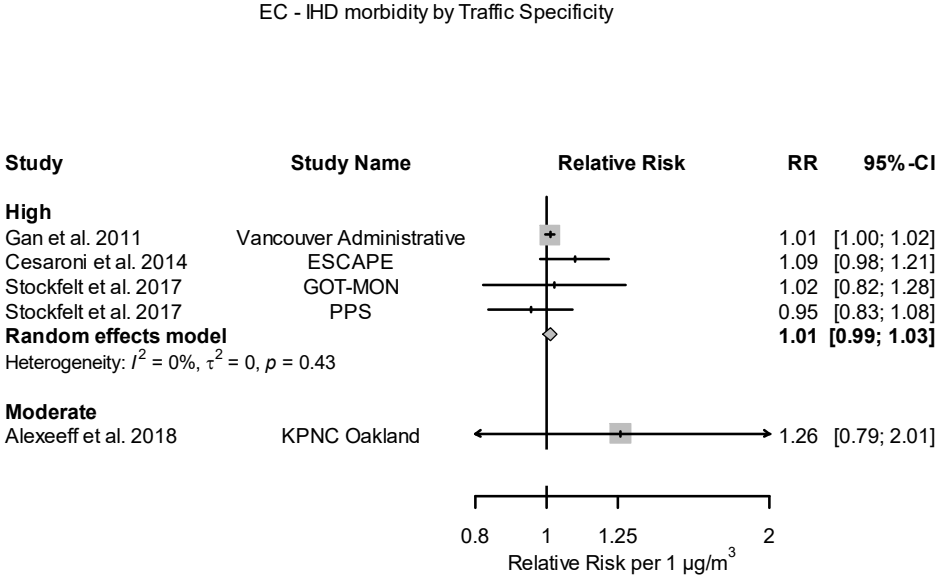
Sensitivity analysis including all available fatality outcomes



Subgroup analysis - by region



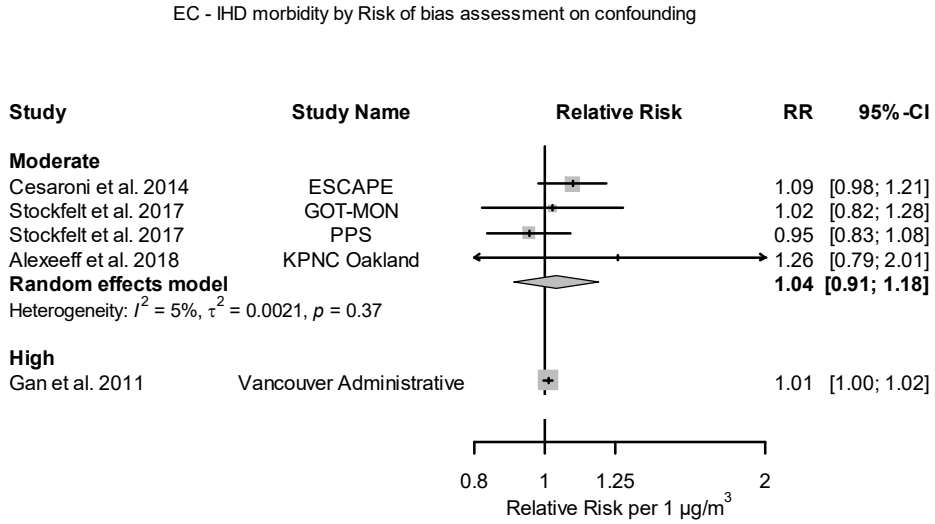
Subgroup analysis - by traffic specificity



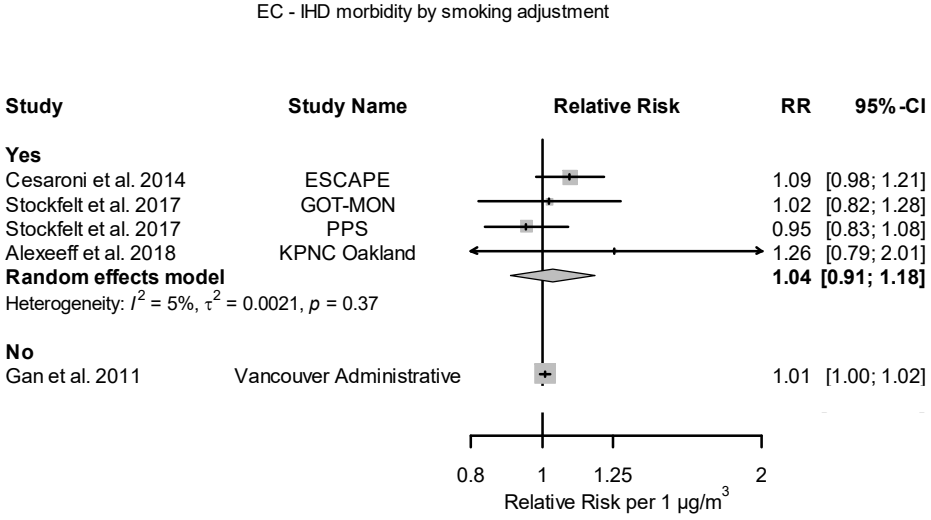
Subgroup analyses – by period: all are general population incidence studies after 2008

Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.

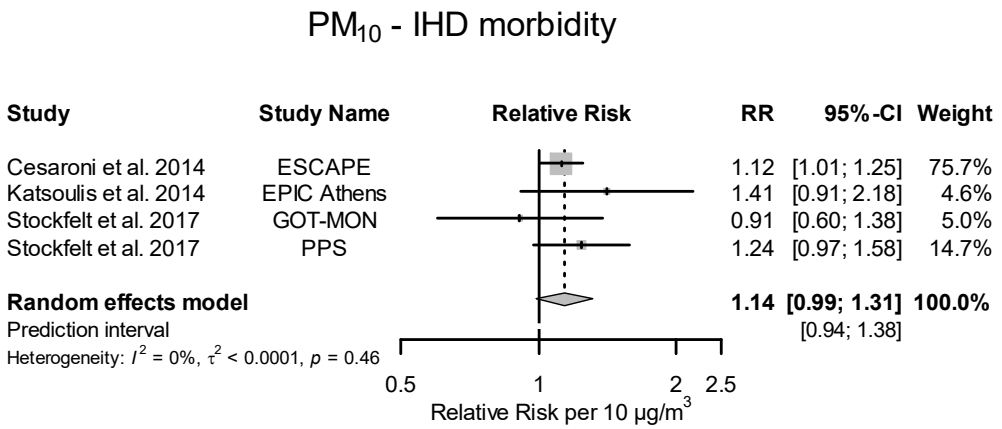


Subgroup analysis - by smoking adjustment



PM_{10}

Primary meta-analysis



All fatal & non-fatal

Subgroup analysis notes:

All are W. European general population incidence studies.

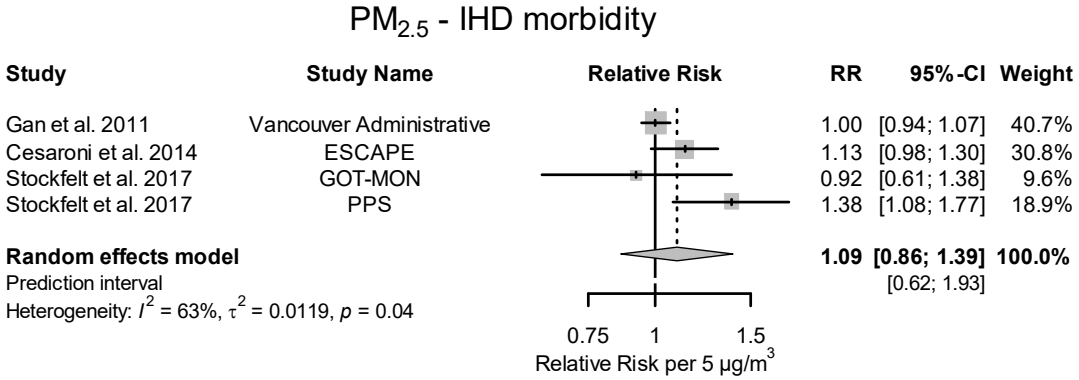
Reporting only on combined fatal and non-fatal events.

All rated moderate for traffic specificity and controlled for individual smoking.

All rated low or moderate for risk of bias domains.

$PM_{2.5}$

Primary meta-analysis



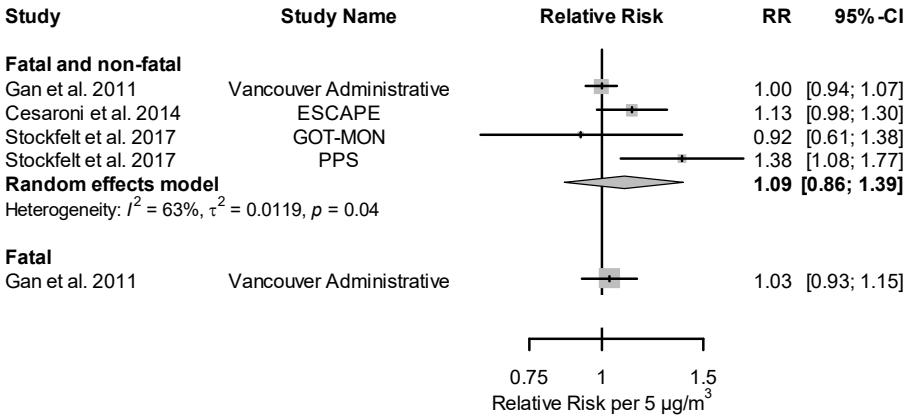
All fatal and non-fatal

Subgroup analysis notes:

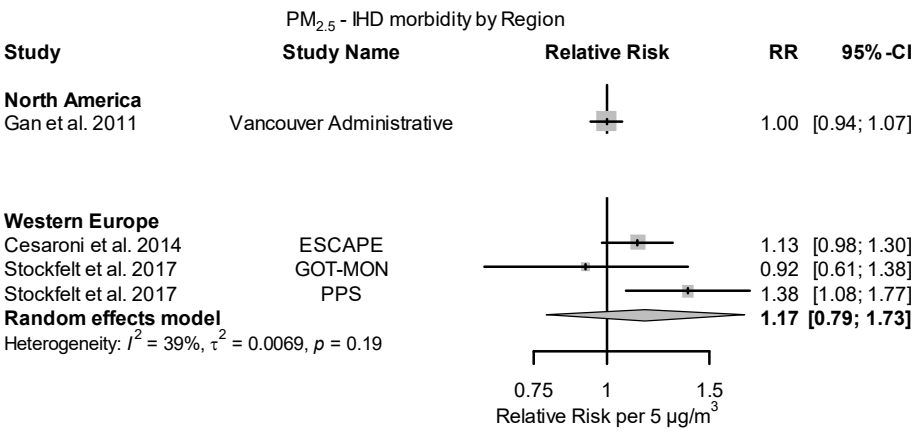
All cohorts after 2008.

All rated moderate traffic specificity.

Sensitivity analysis with all reported estimates

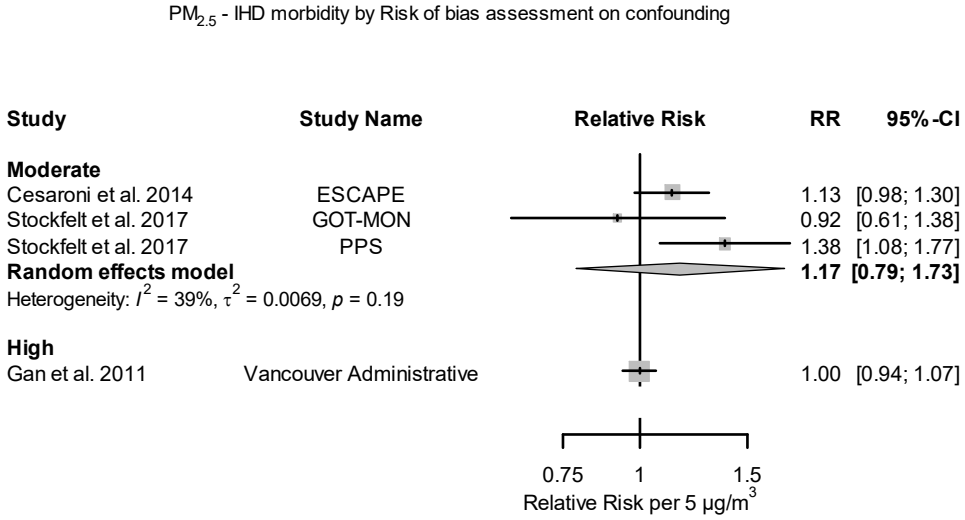


Subgroup analysis - by region

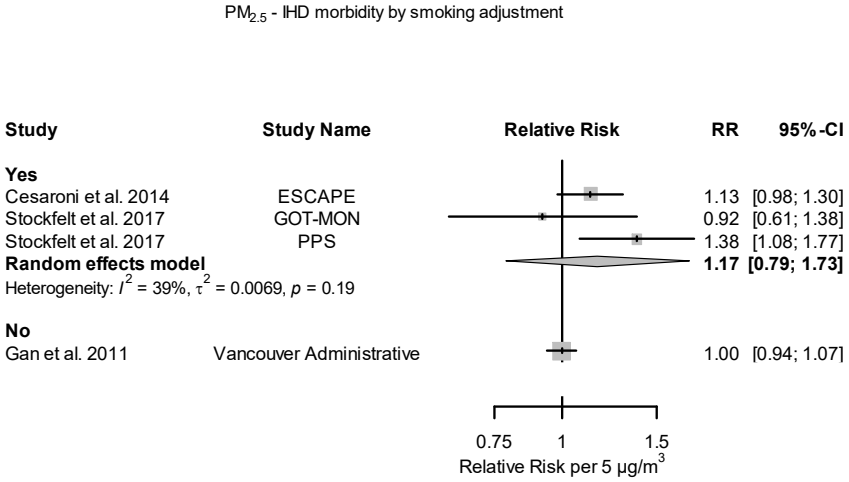


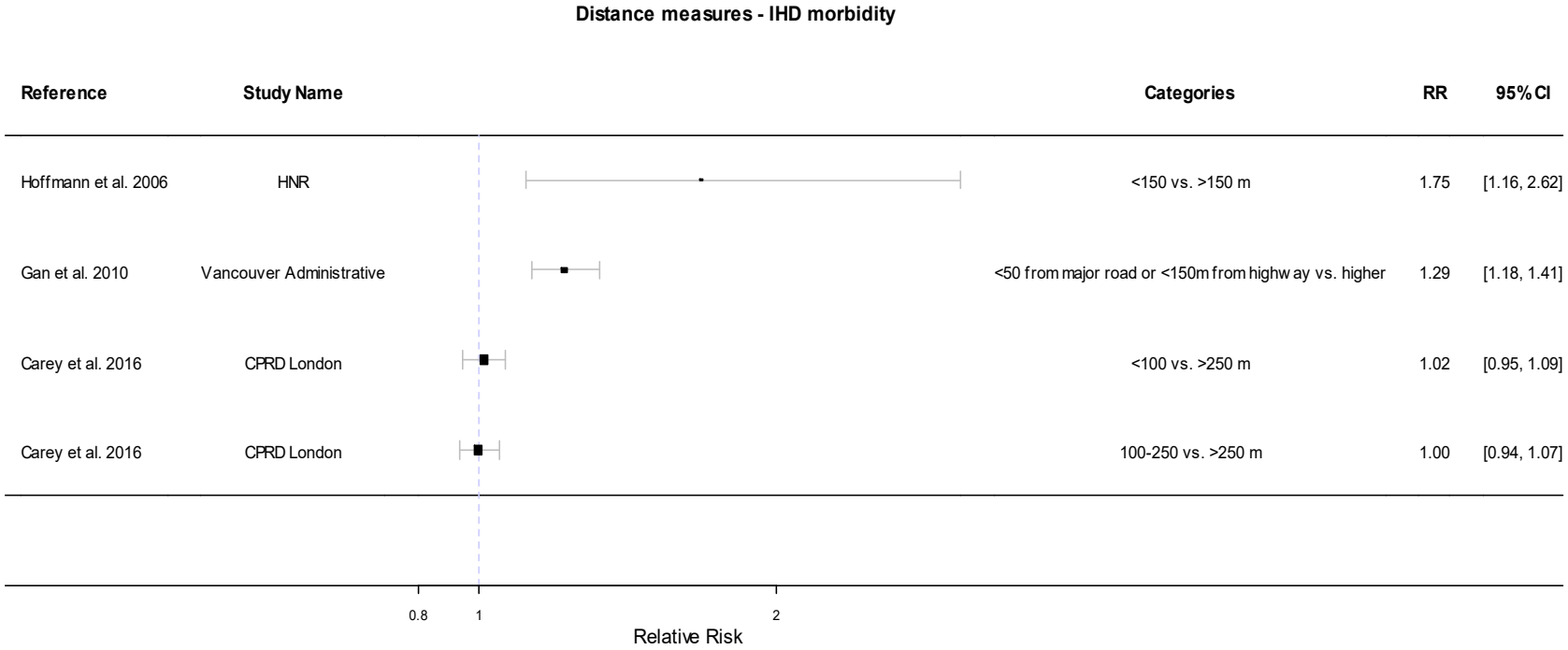
Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.



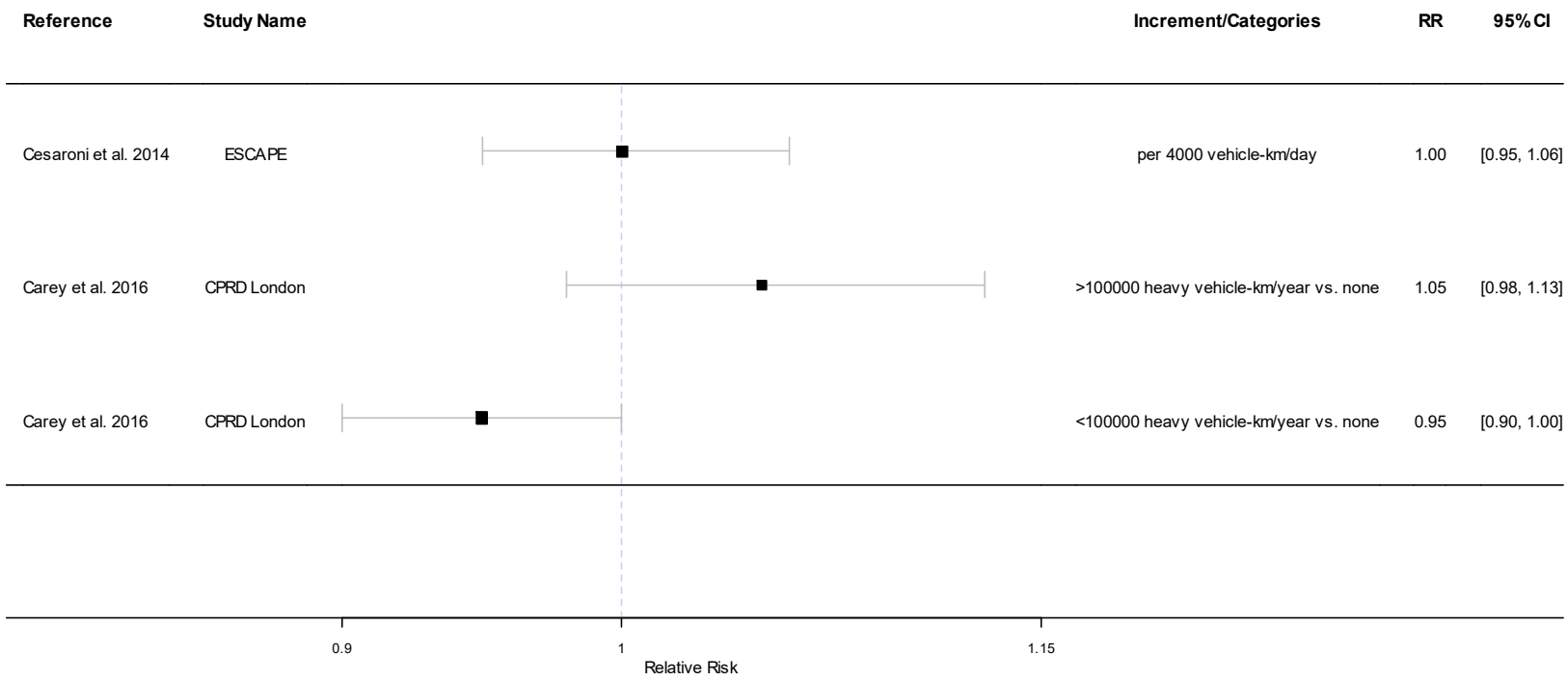
Subgroup analysis - by smoking adjustment





Hoffmann et al. 2006 is a cross-sectional study. All are general population cohorts.

Traffic Density measures - IHD morbidity



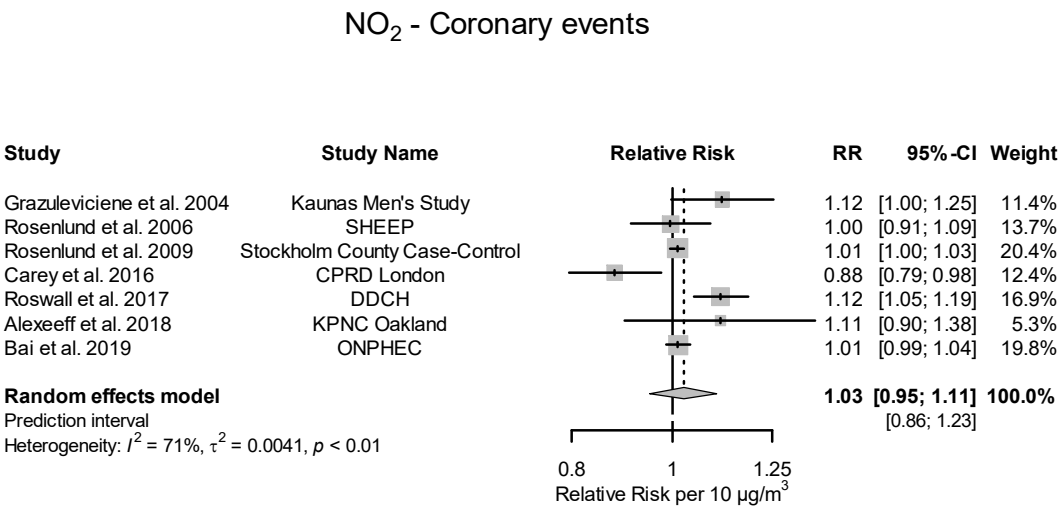
10.2 Coronary events

Only sufficient studies to conduct meta-analysis for NO_2.

NO_2

Primary meta-analysis

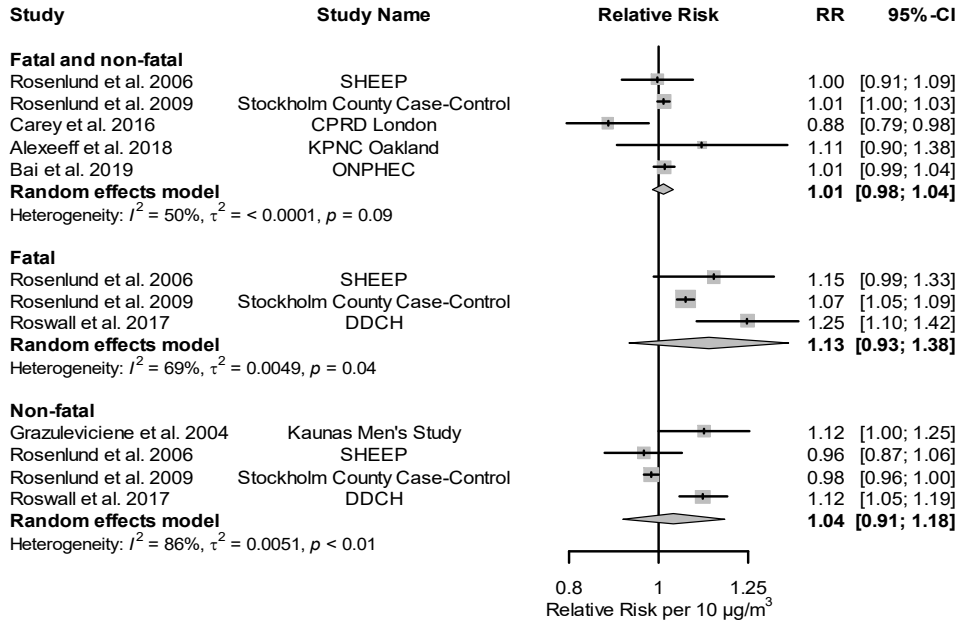
All are fatal & nonfatal except for Grazuleviciene et al. 2004 and Roswall et al. 2017 which



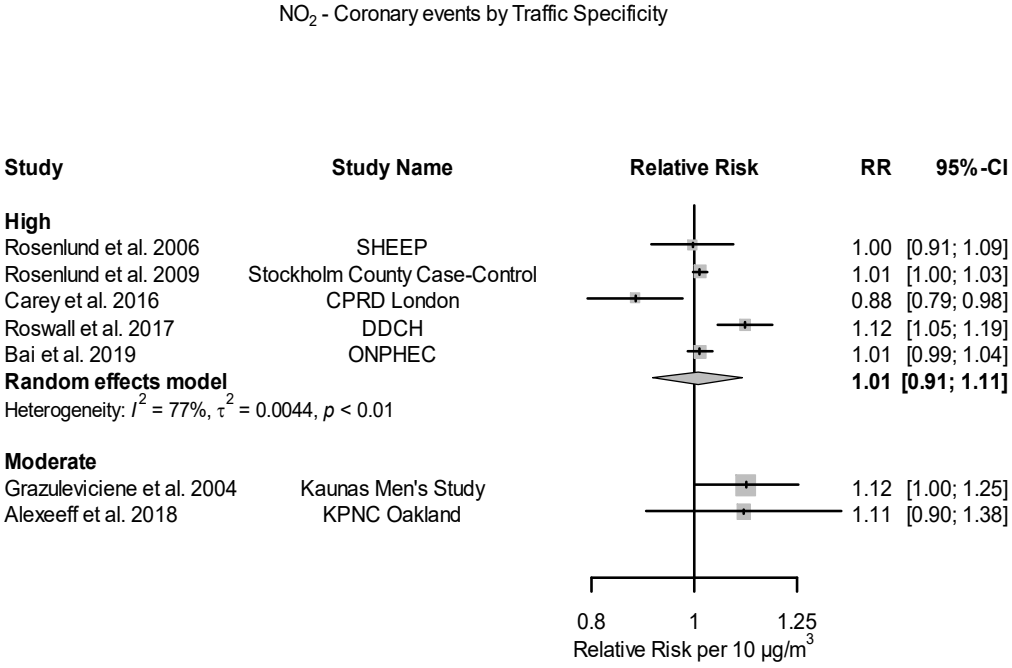
are only nonfatal.

All coronary event studies are incidence studies unless indicated.

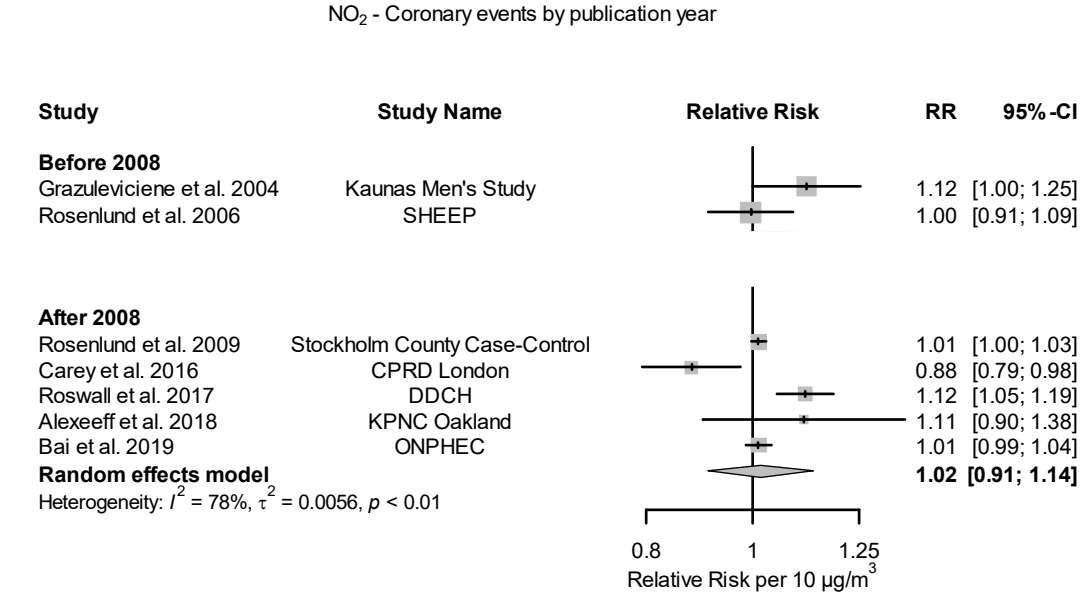
Sensitivity analysis including all available outcomes



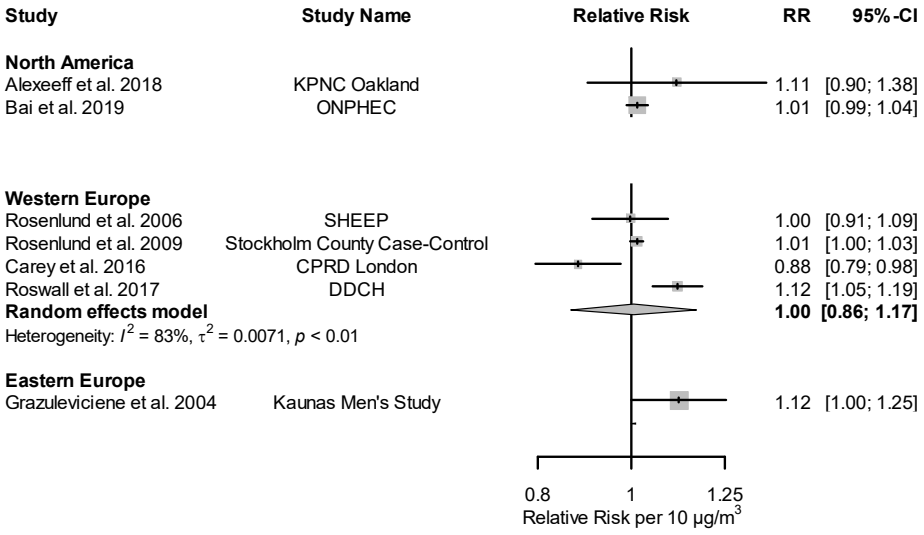
Subgroup analysis - by traffic specificity



Subgroup analysis - by publication year



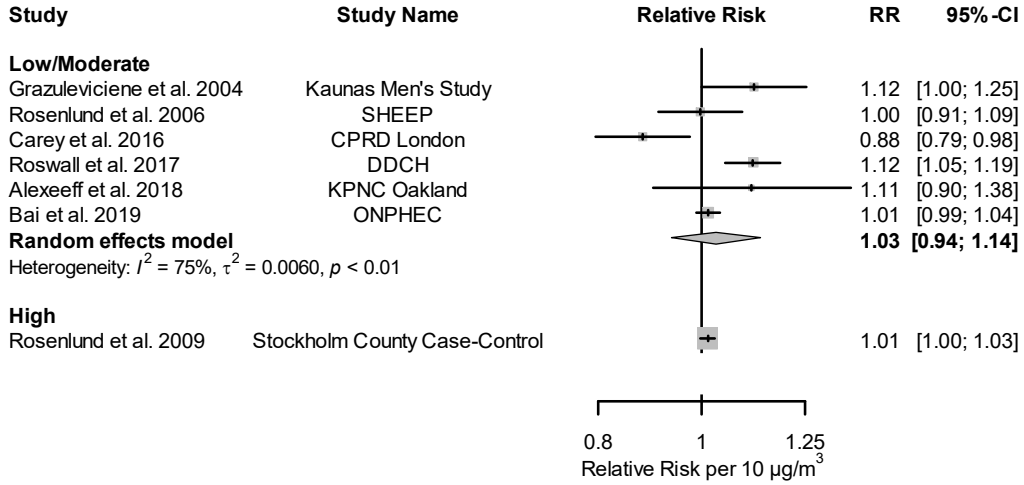
Subgroup analysis - by region



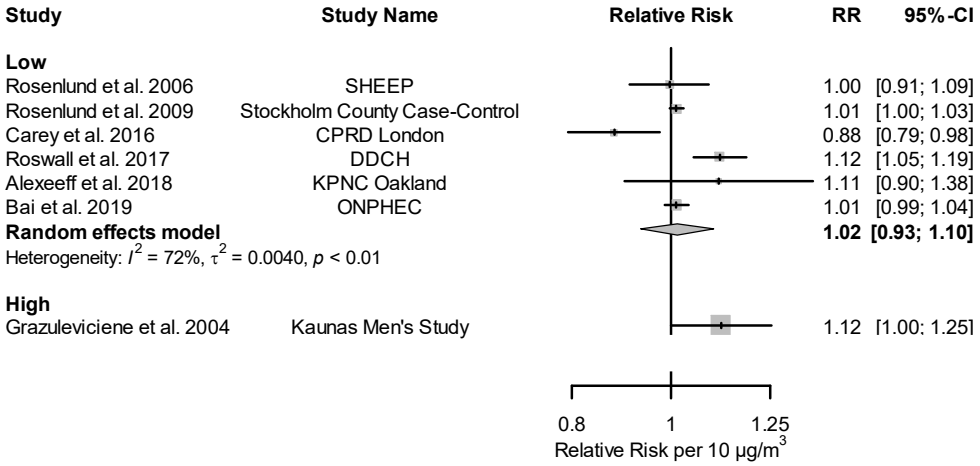
Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate

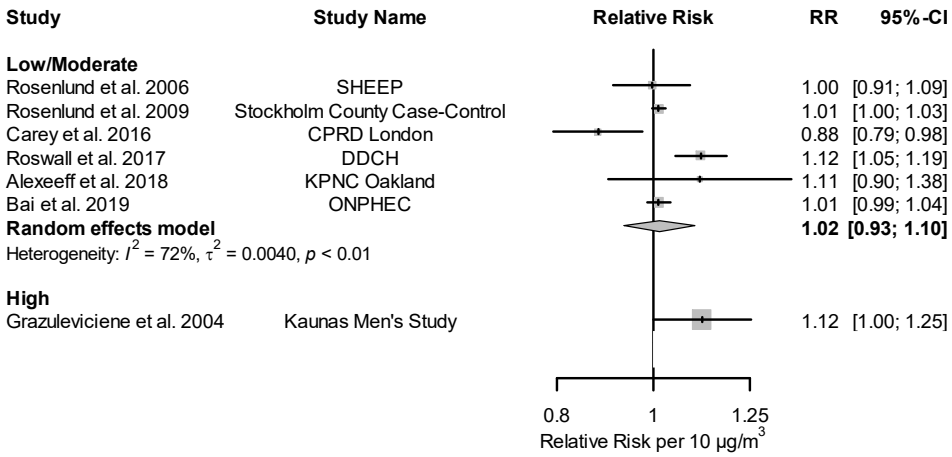
NO_2 - Coronary events by Risk of bias assessment on confounding



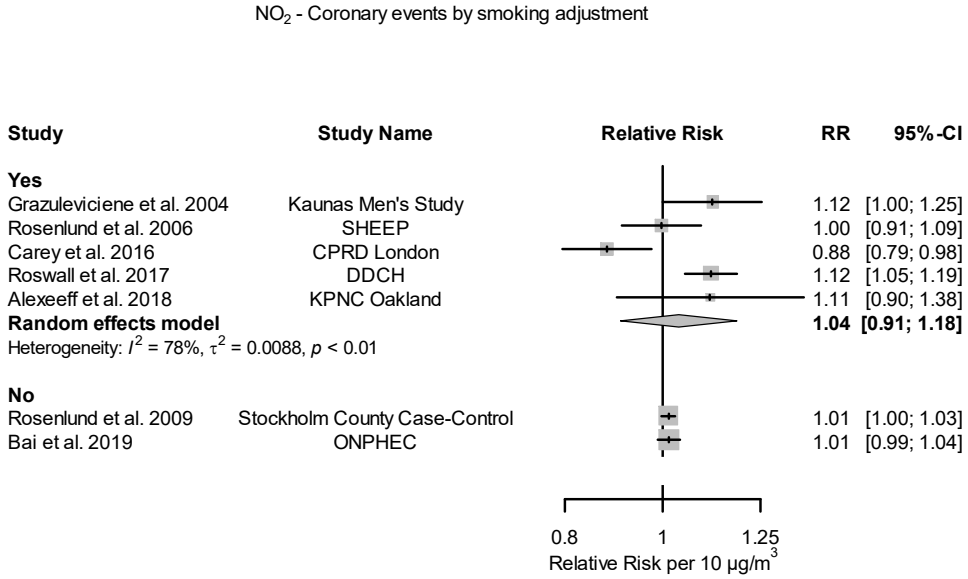
NO_2 - Coronary events by Risk of bias assessment on selection bias



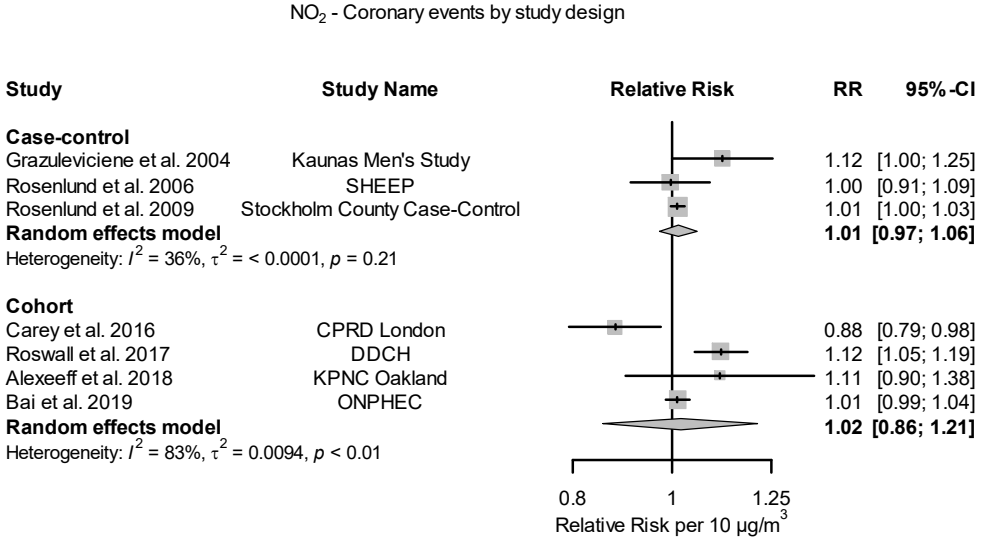
NO_2 - Coronary events by Risk of bias assessment on missing data

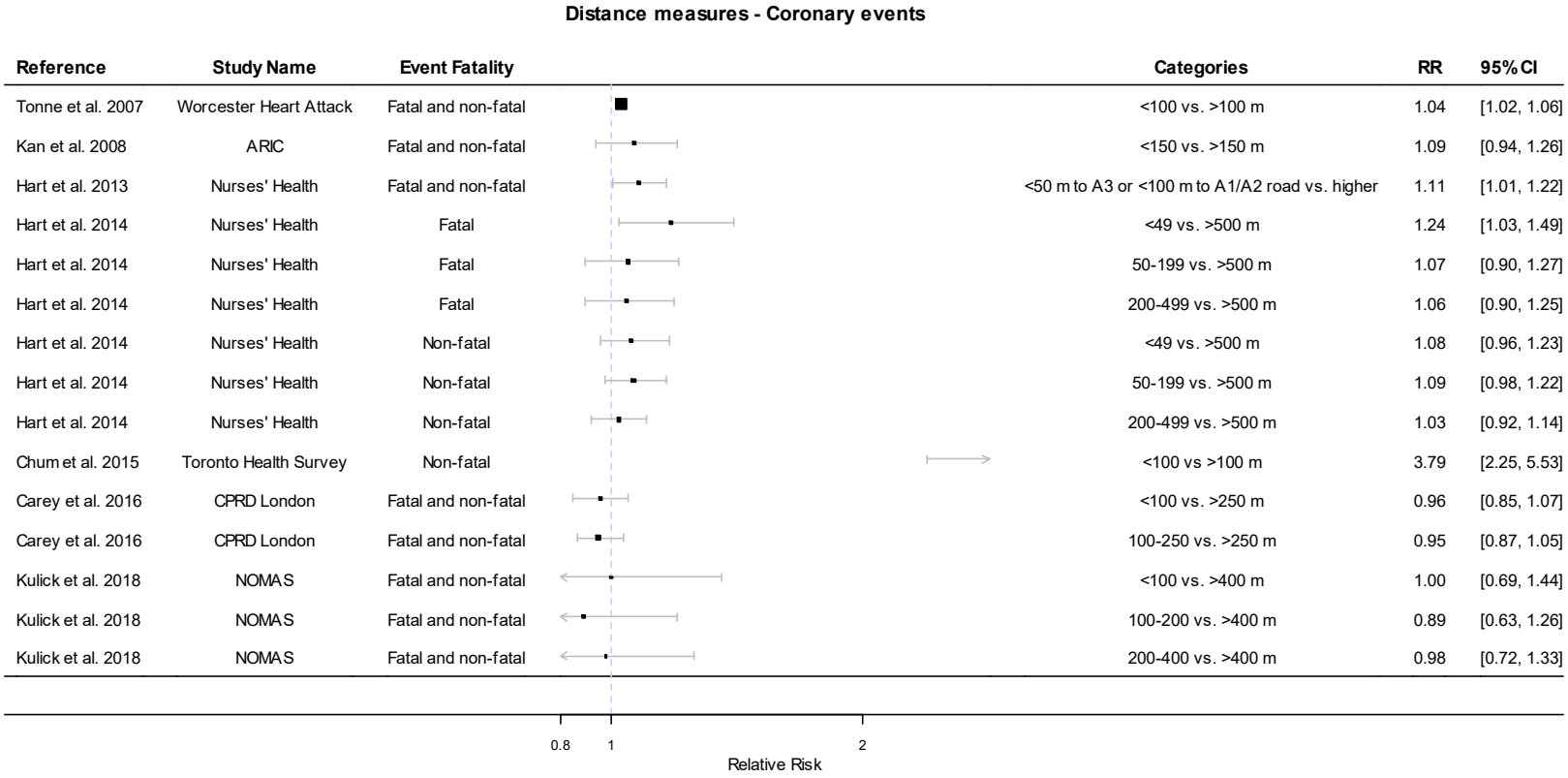


Subgroup analysis - by smoking adjustment

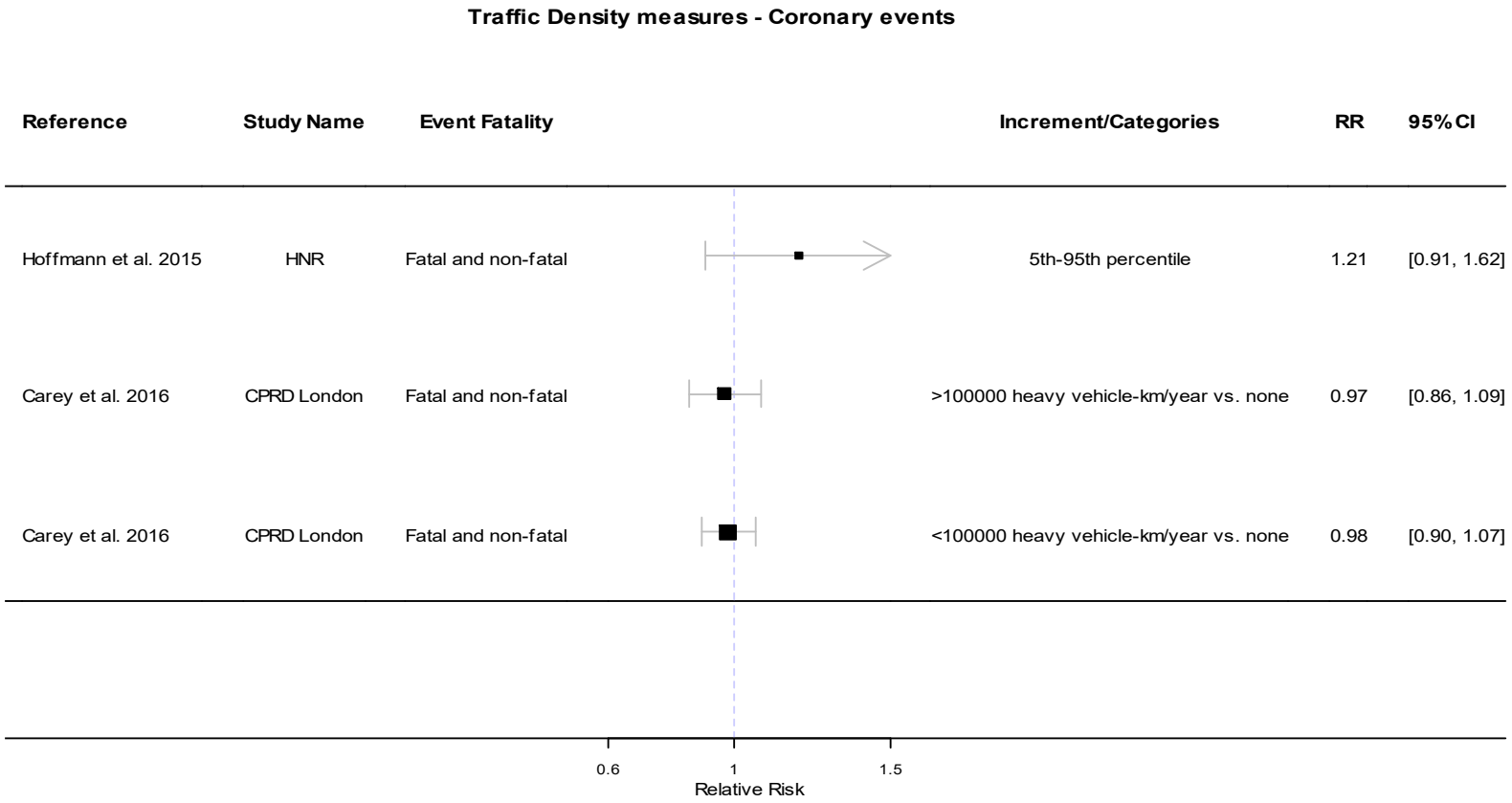


Subgroup analysis - by study design





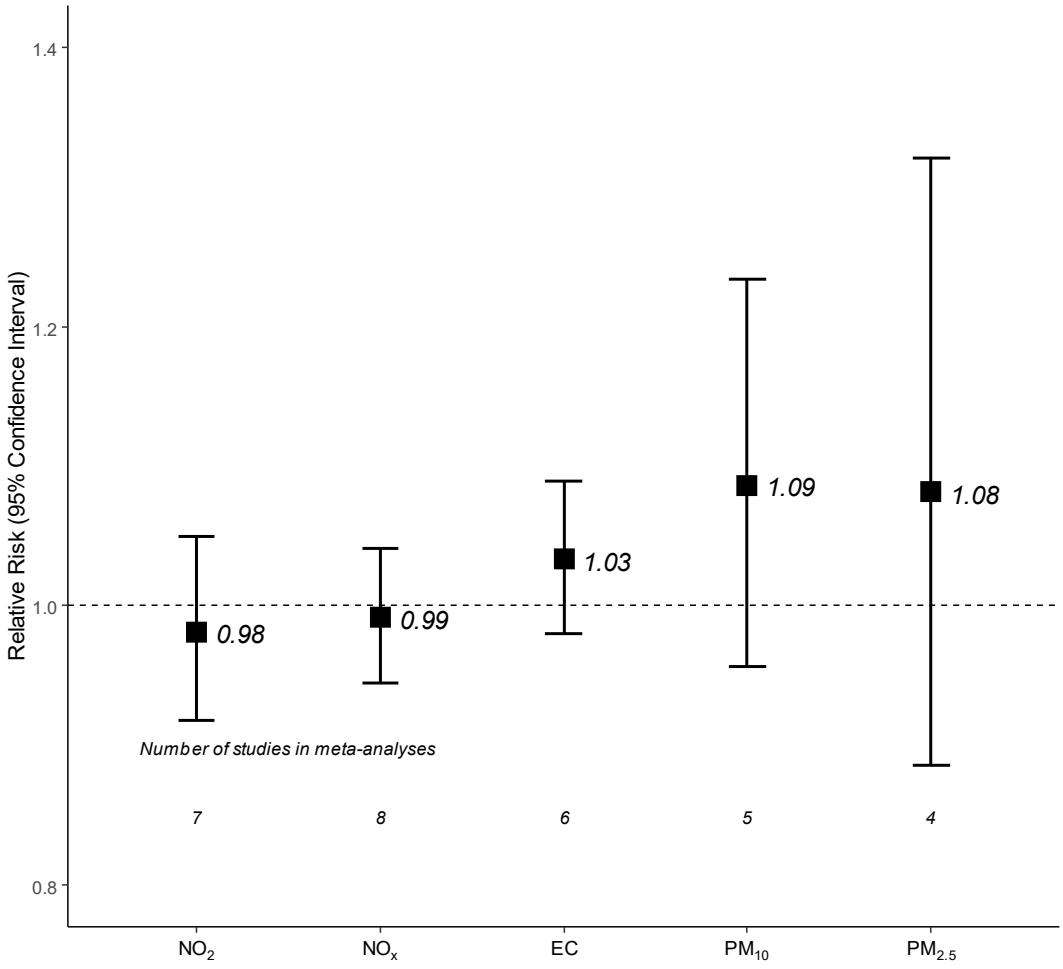
Chum et al. 2015 is a cross-sectional study.



Kan et al. 2008 not in plot because estimate was log-transformed.

10.3 Stroke

Summary of meta-analysis incidence

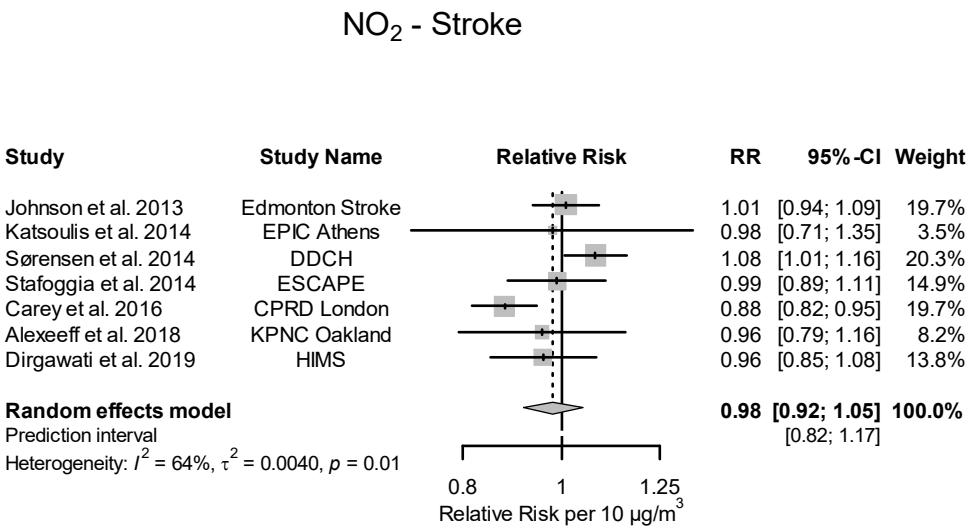


Footnote: The following increments were used: 10 µg/m^3 for NO_2, 20 µg/m^3 for NO_x, 1 µg/m^3 for EC, 10 µg/m^3 for PM_{10} and 5 µg/m^3 for $PM_{2.5}$. Effect estimates cannot be directly compared across the different traffic-related pollutants because the selected increments do not necessarily represent the same contrast in exposure.

All stroke studies are incidence studies unless indicated.

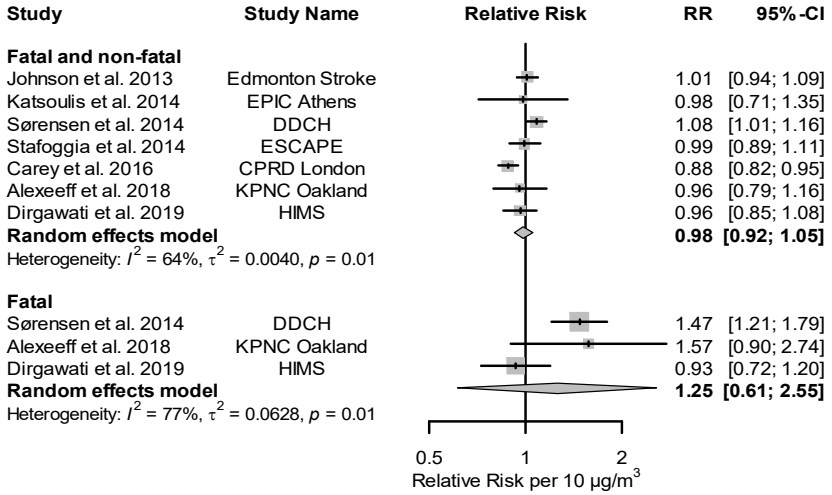
NO_2

Primary meta-analysis

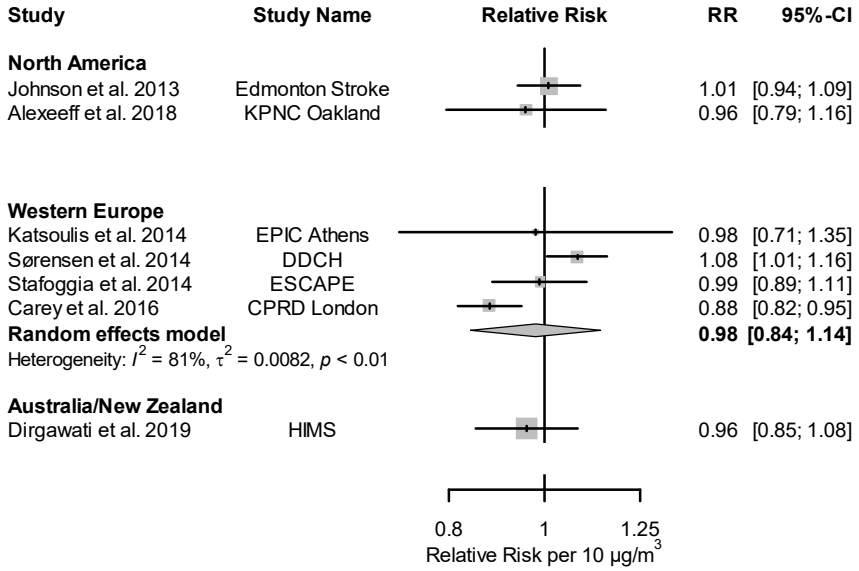


All were fatal and non-fatal

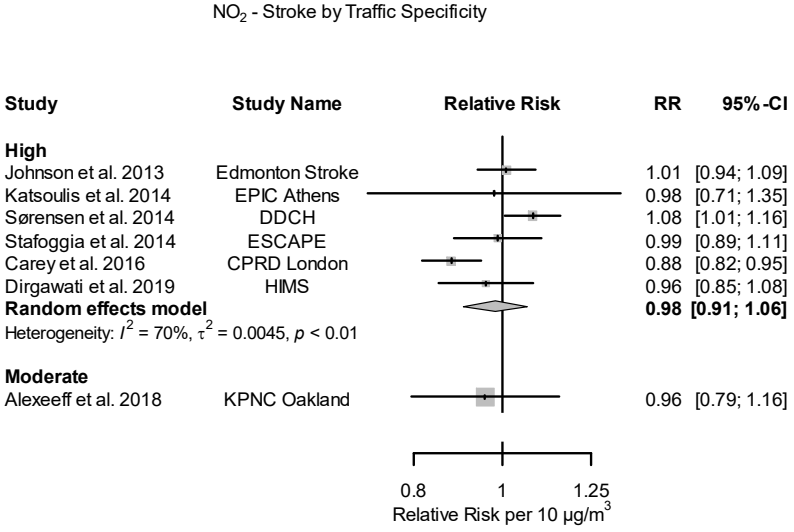
Sensitivity analysis including all available outcomes



Subgroup analysis - by region



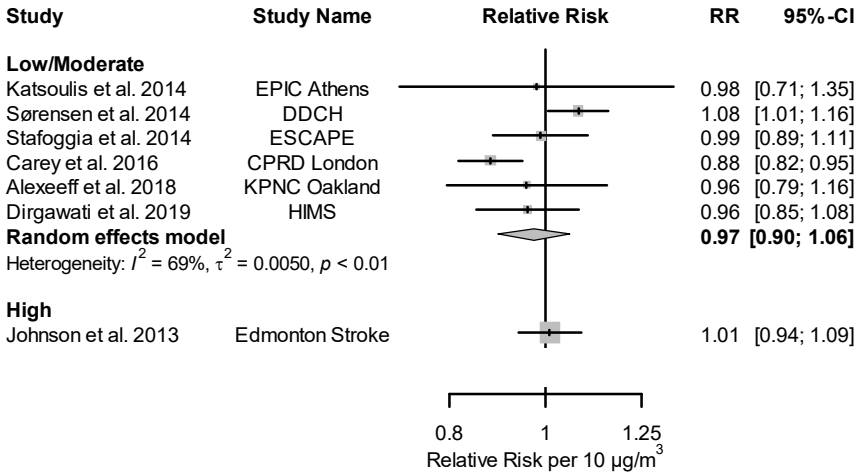
Subgroup analysis - by traffic specificity



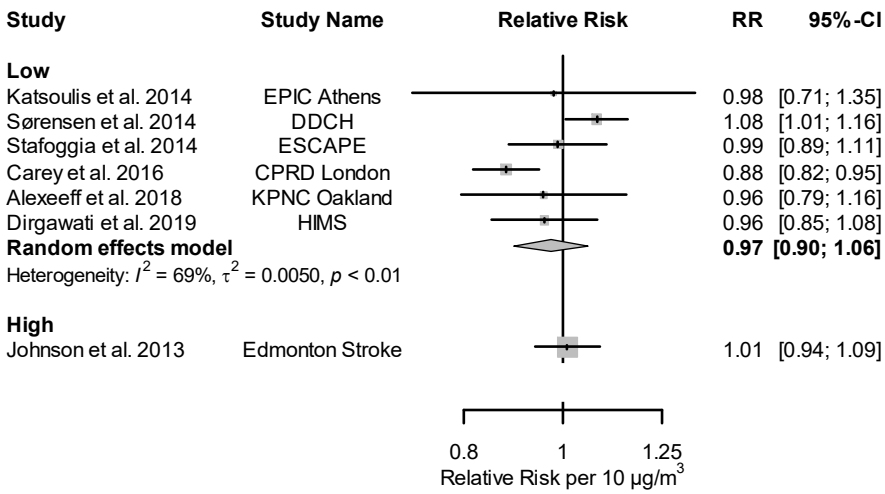
Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.

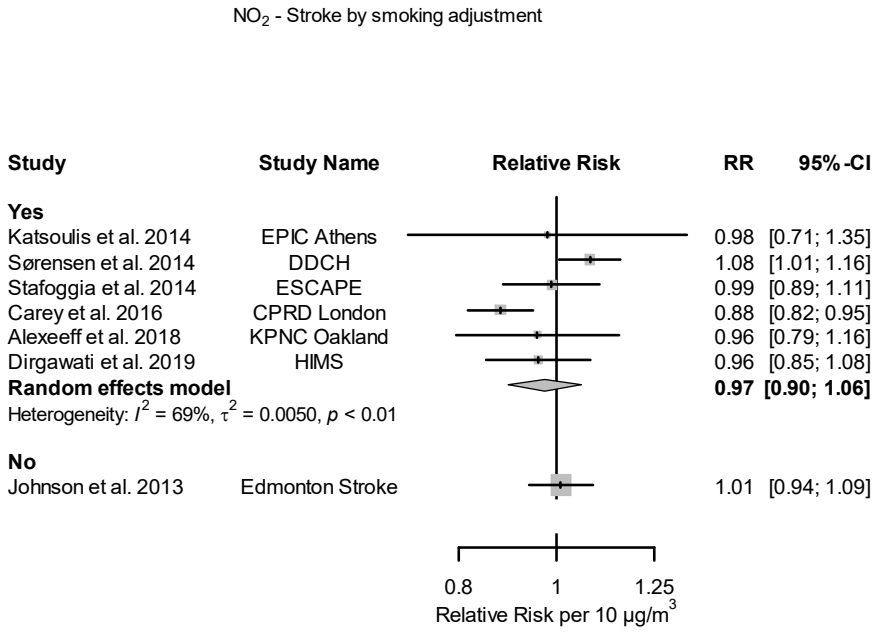
NO_2 - Stroke by Risk of bias assessment on confounding



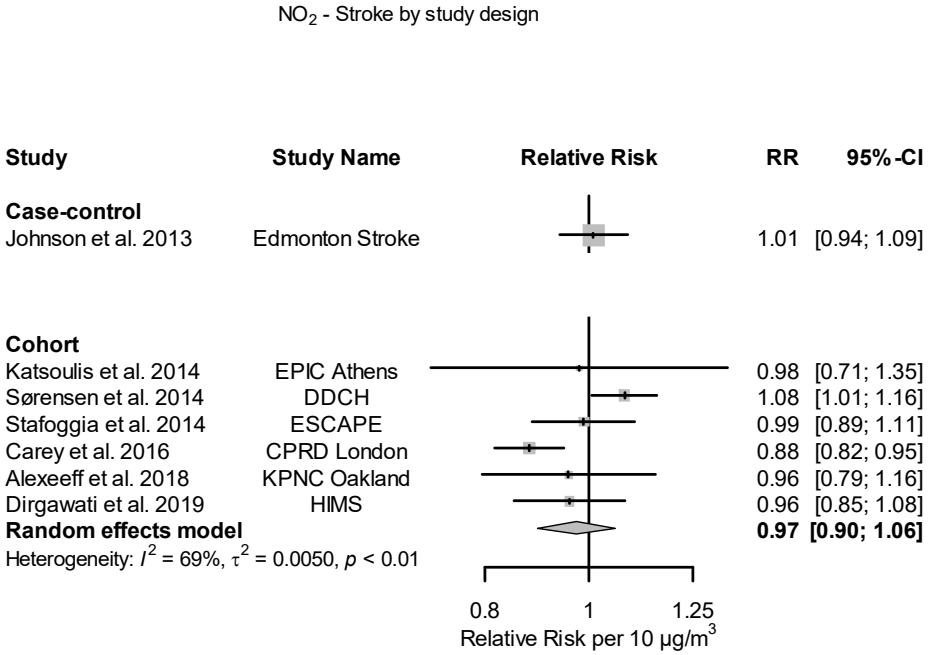
NO_2 - Stroke by Risk of bias assessment on selection bias



Subgroup analysis - by smoking adjustment

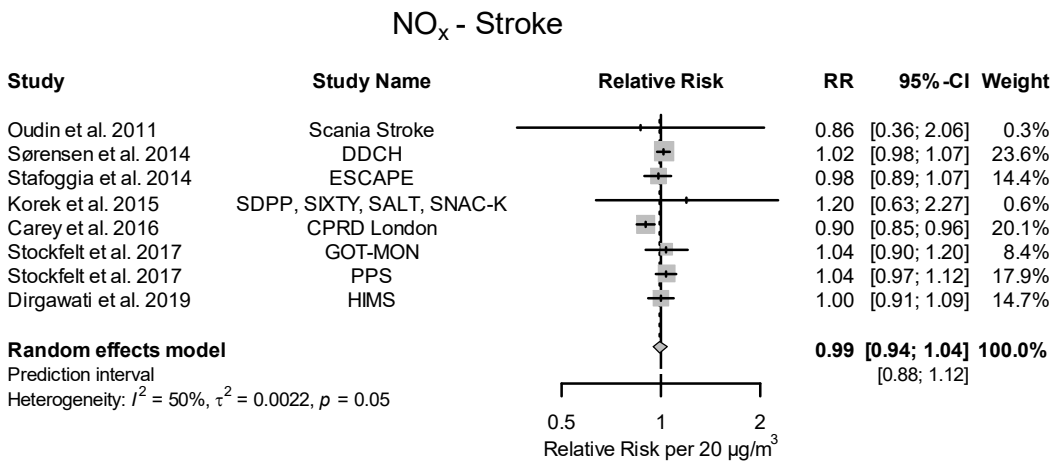


Subgroup analysis - by study design



NO_x

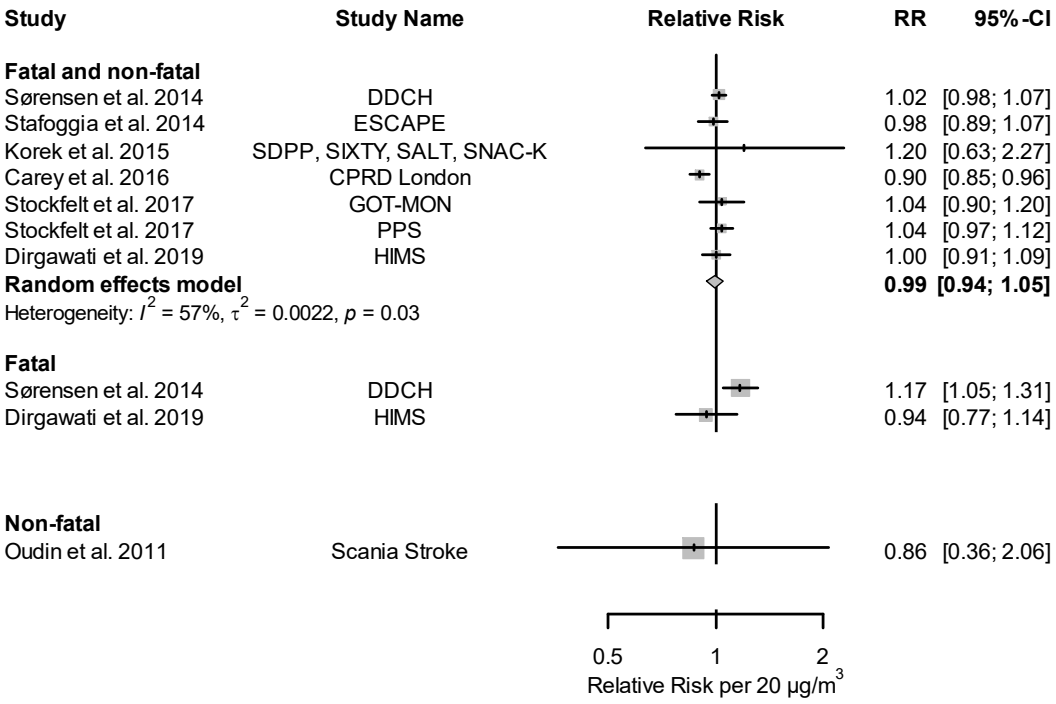
Primary meta-analysis



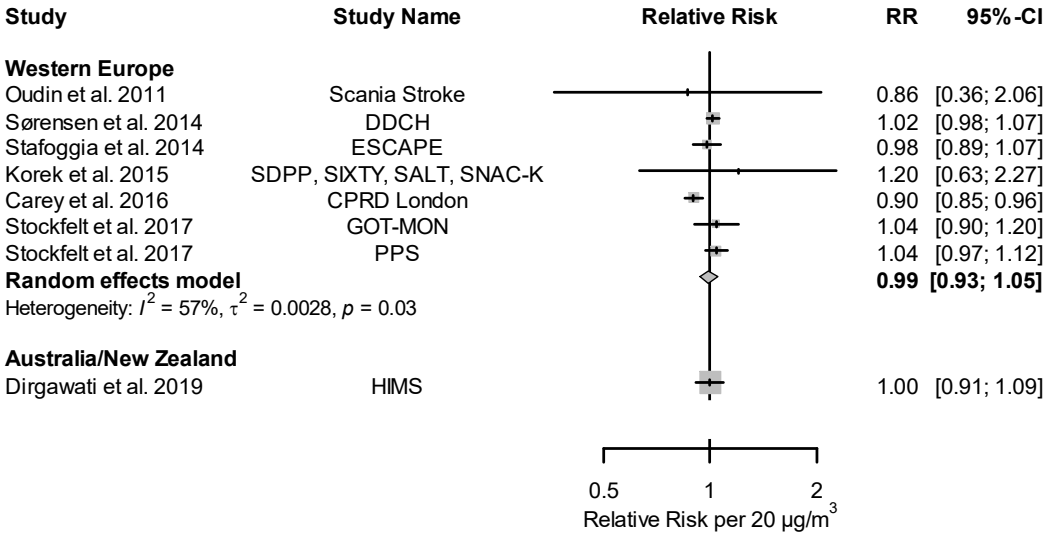
All are fatal & non-fatal except Oudin et al. 2011 which is only non-fatal.

Oudin et al. 2011 are estimates from a case-control study based on prevalent cases.

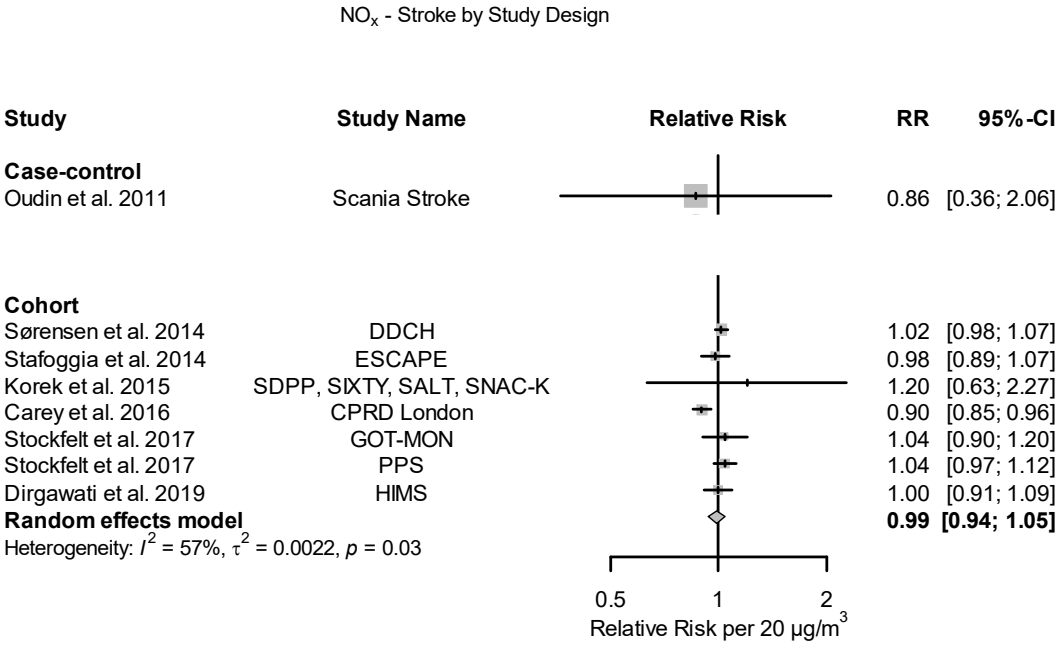
Sensitivity analysis including all available outcomes



Subgroup analysis - by region



Subgroup analysis- by study design



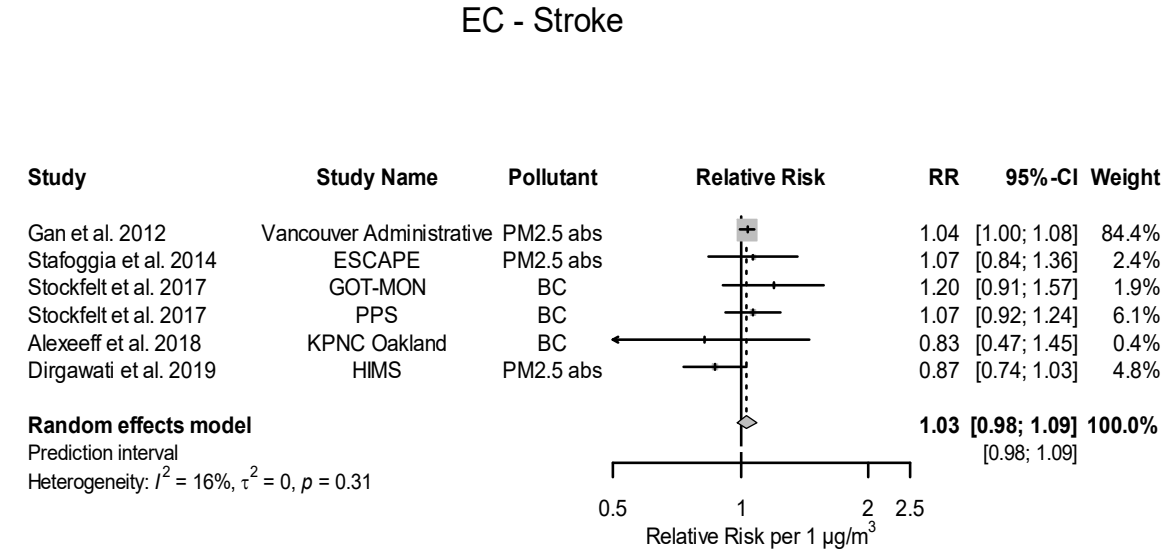
Subgroup analysis notes:

All studies rated high for traffic specificity and control for individual smoking.

All studies rated low or moderate for risk of bias domains.

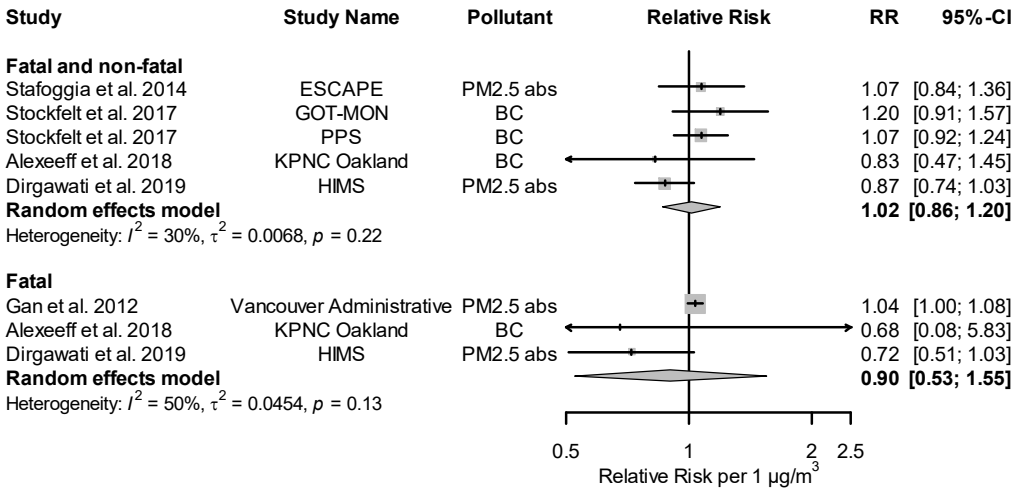
EC

Primary meta-analysis

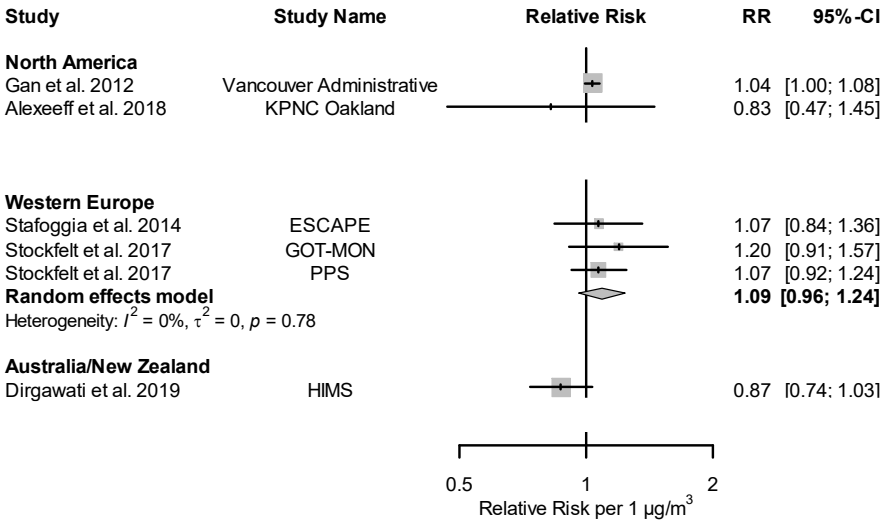


All are fatal & non-fatal except Gan et al. 2012 which is only fatal.

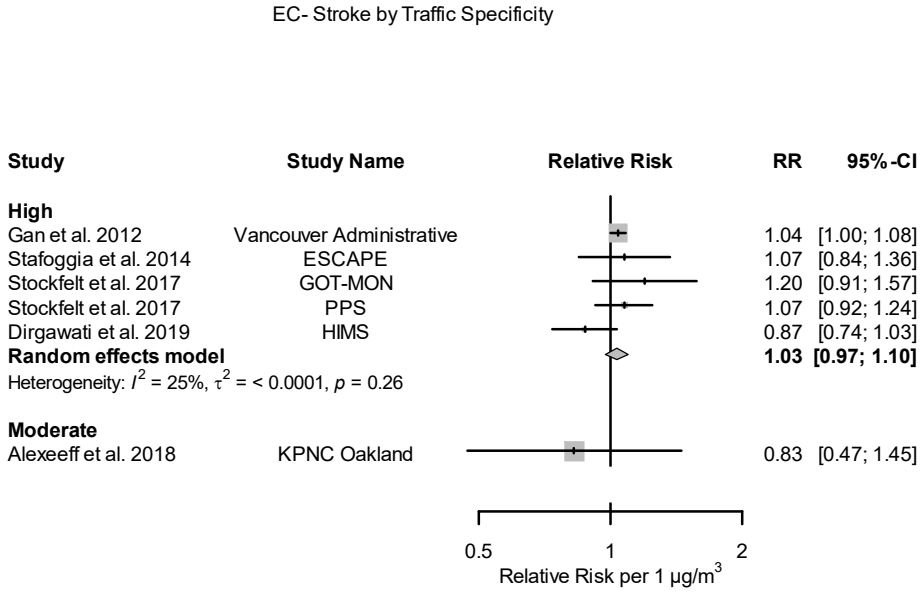
Sensitivity analysis including all available outcomes



Subgroup analysis - by region

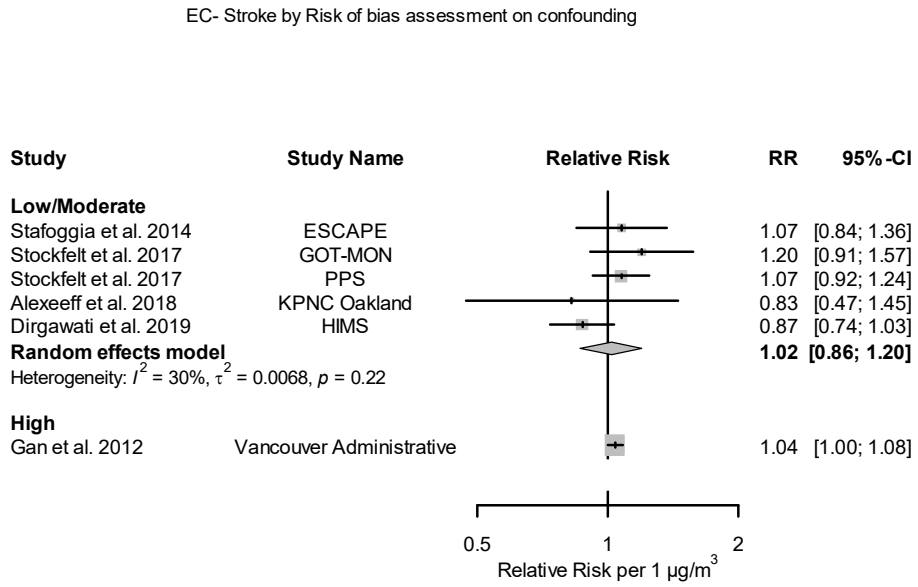


Subgroup analysis - by traffic specificity

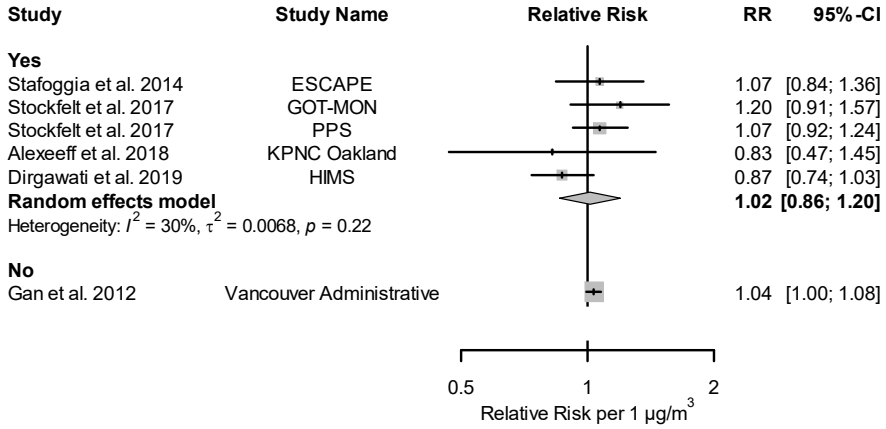


Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate

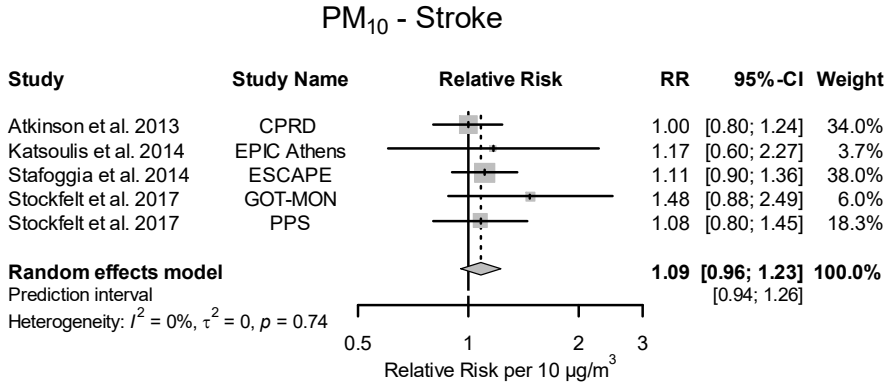


Subgroup analysis - by smoking adjustment



PM_{10}

Primary meta-analysis



All were fatal & non-fatal

Subgroup analysis notes:

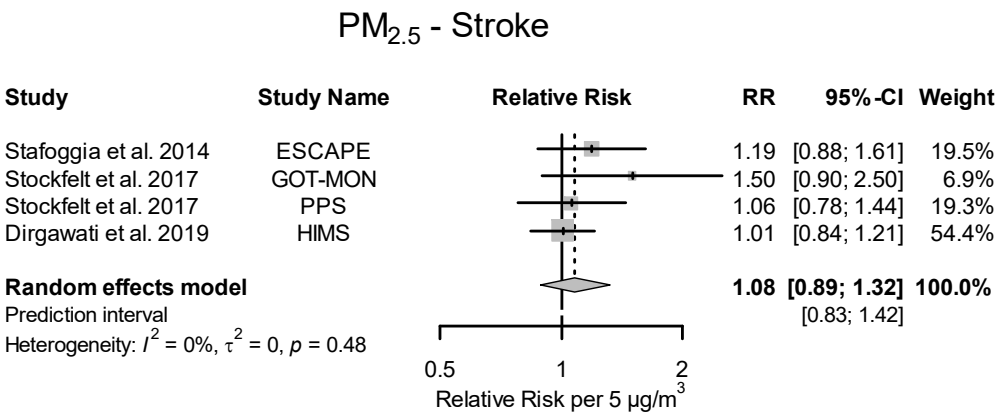
There were no multiple outcomes per study.

All are W. European incidence cohorts that control for smoking and rated moderate for traffic specificity.

All were rated low or moderate for risk of bias domains.

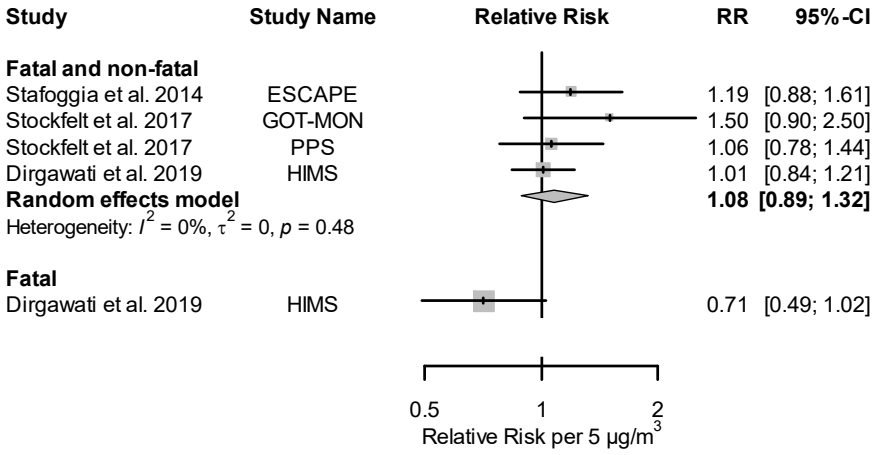
$PM_{2.5}$

Primary meta-analysis

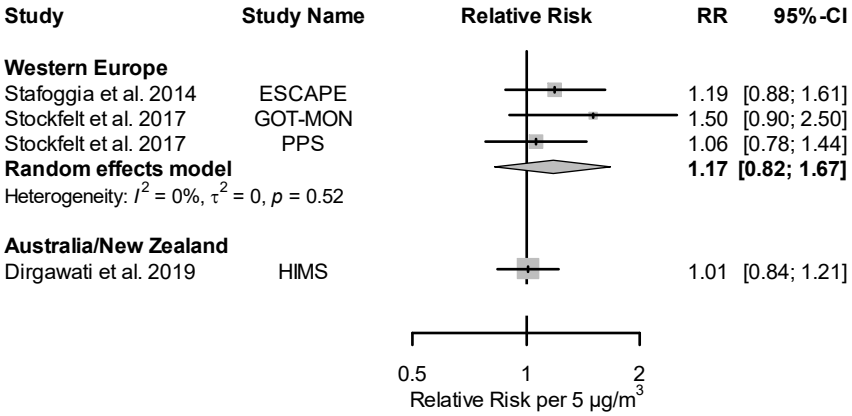


All fatal & non-fatal

Sensitivity analysis with all reported estimates



Subgroup analysis - by region

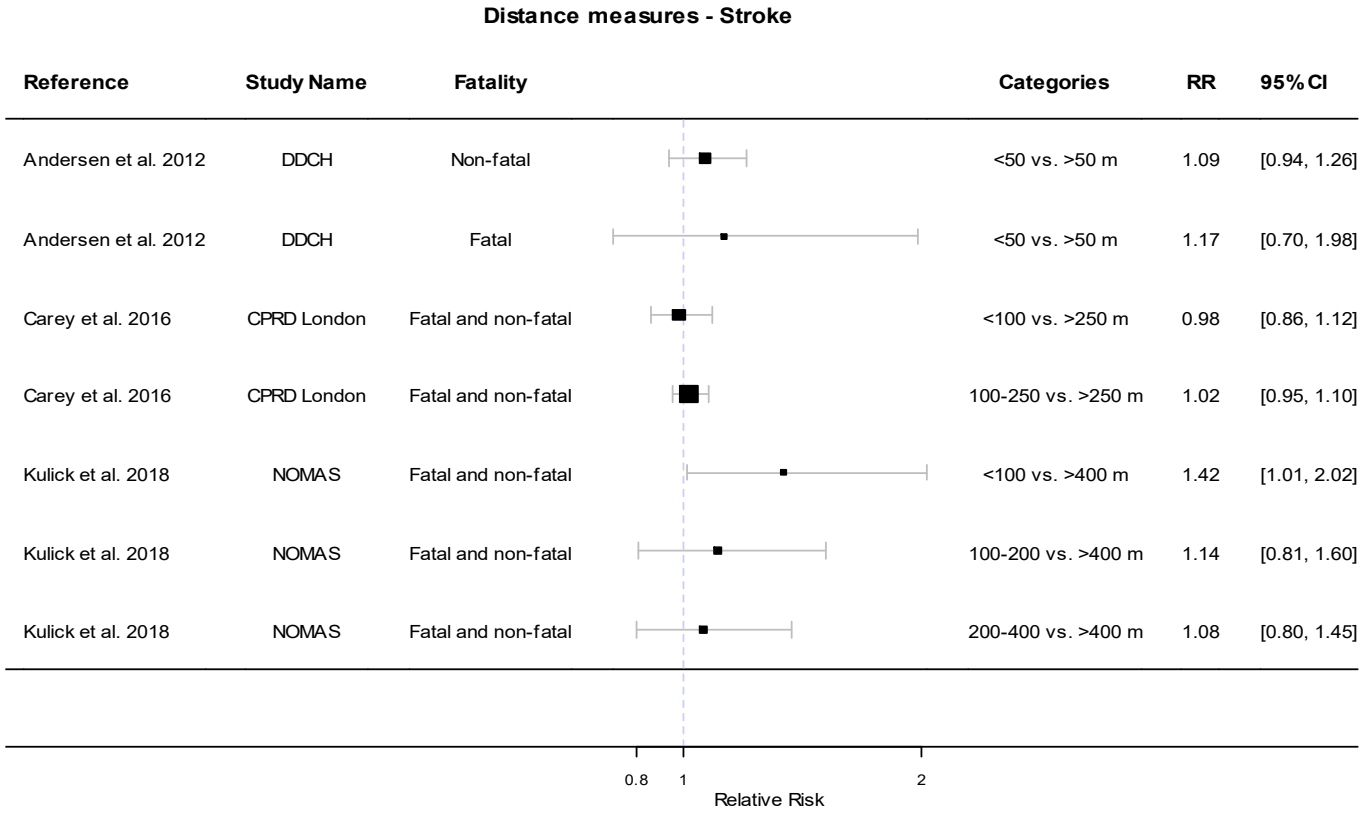


Subgroup analysis notes:

All were cohort studies.

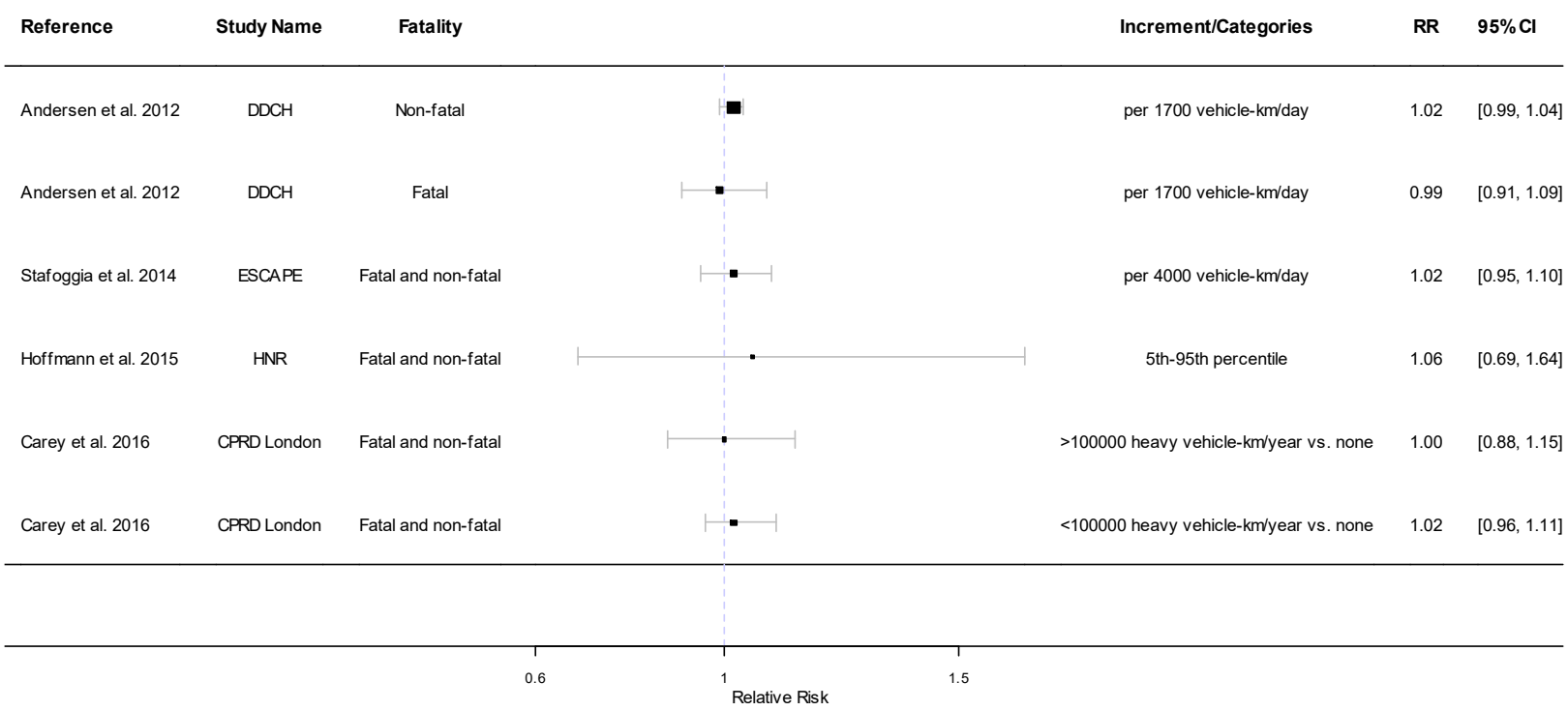
All studies were rated moderate for traffic specificity and all adjust for individual smoking.

All were rated low or moderate for risk of bias domains.



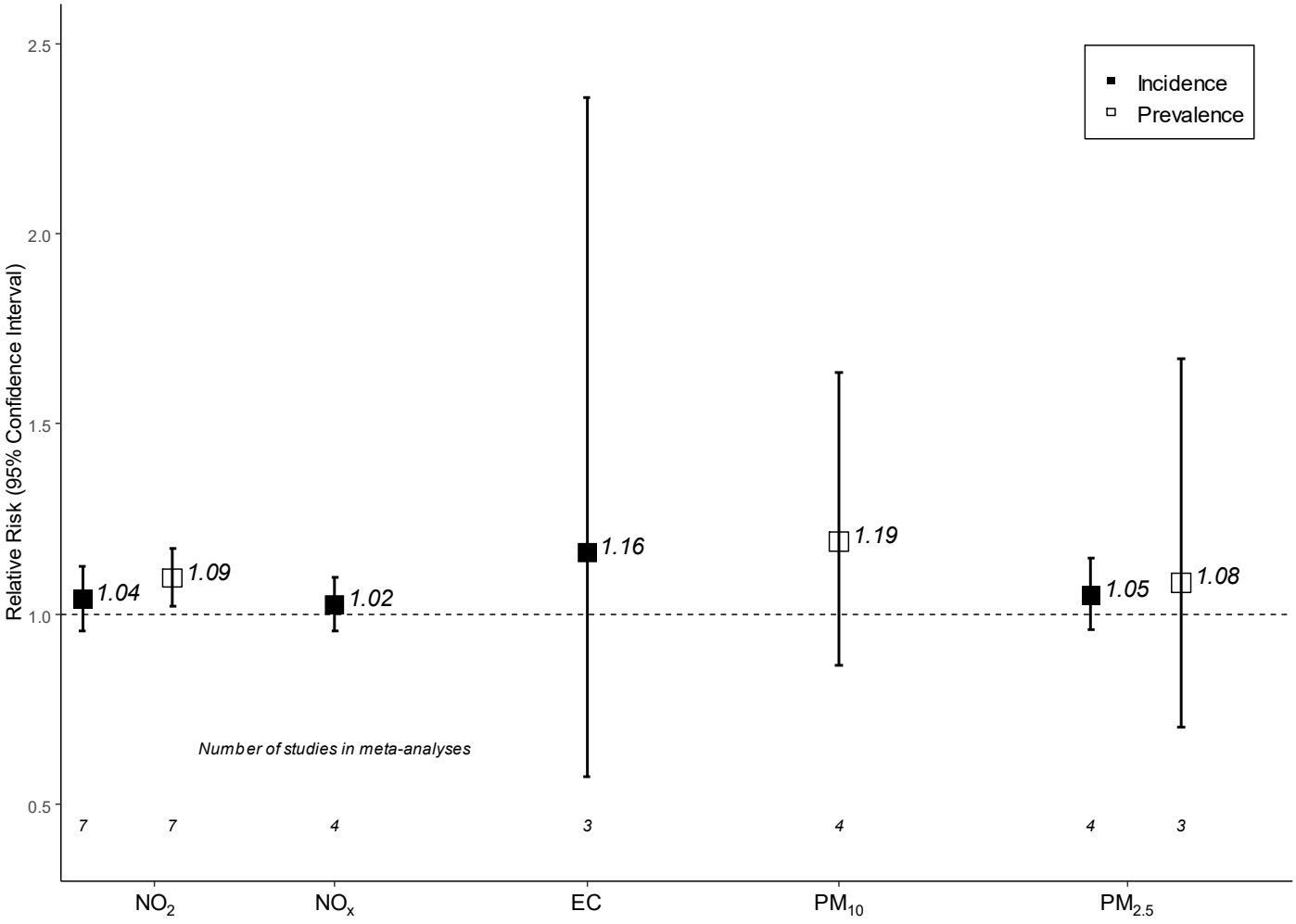
Lazarevic et al. 2015 not in the plot because estimate was log-transformed.

Traffic Density measures - Stroke



10.4 Diabetes

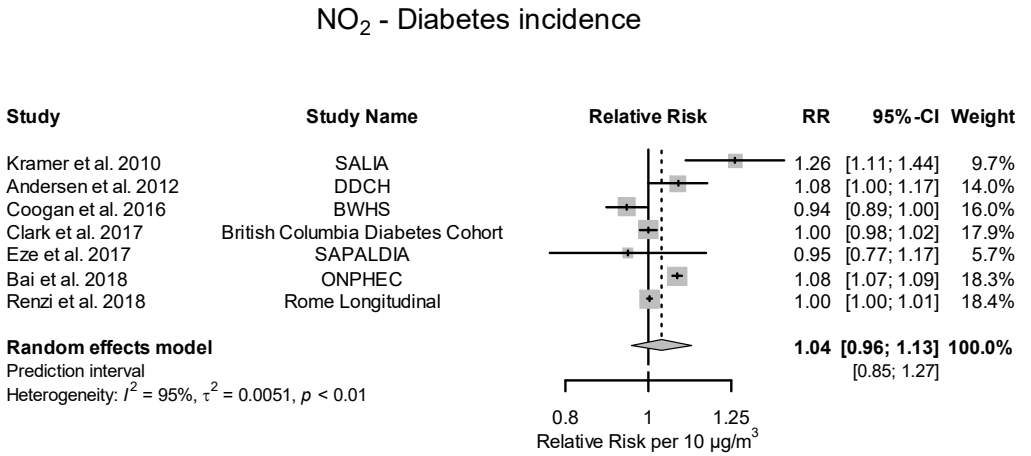
Summary of meta-analysis - incidence and prevalence



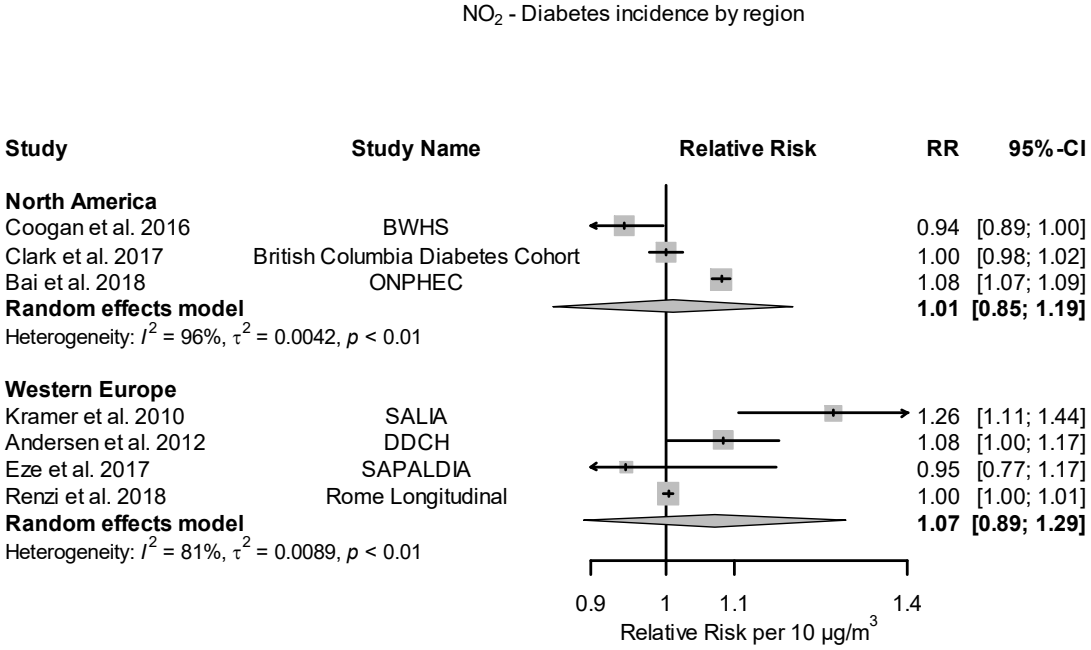
Footnote: The following increments were used: 10 µg/m^3 for NO_2, 20 µg/m^3 for NO_x, 1 µg/m^3 for EC, 10 µg/m^3 for PM_{10} and 5 µg/m^3 for $PM_{2.5}$. Effect estimates cannot be directly compared across the different traffic-related pollutants because the selected increments do not necessarily represent the same contrast in exposure.

NO_2 - incidence

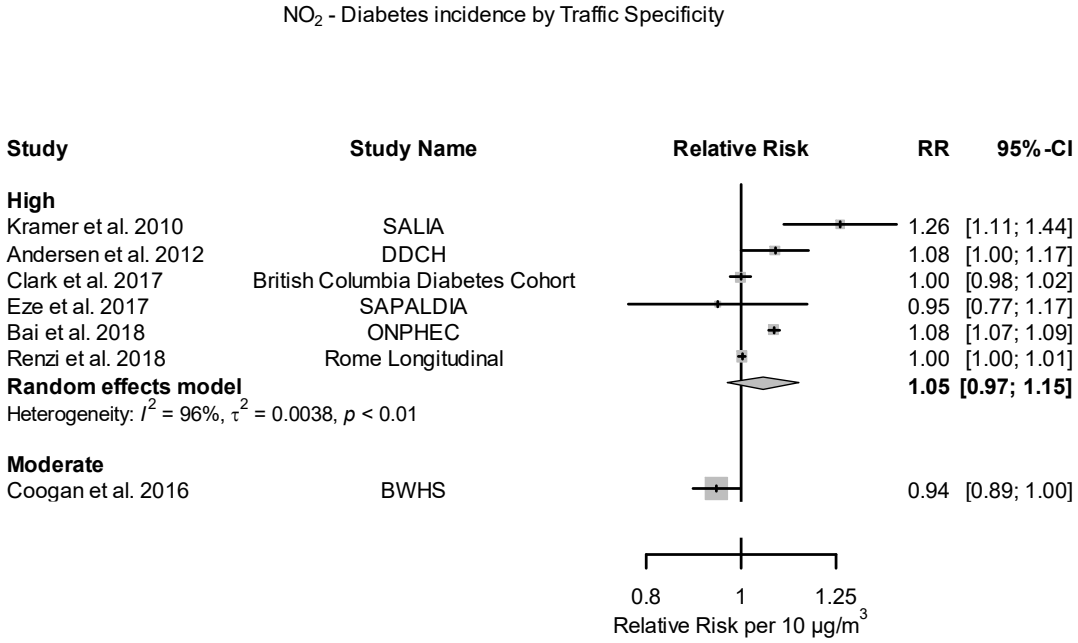
Primary meta-analysis



Subgroup analysis - by region

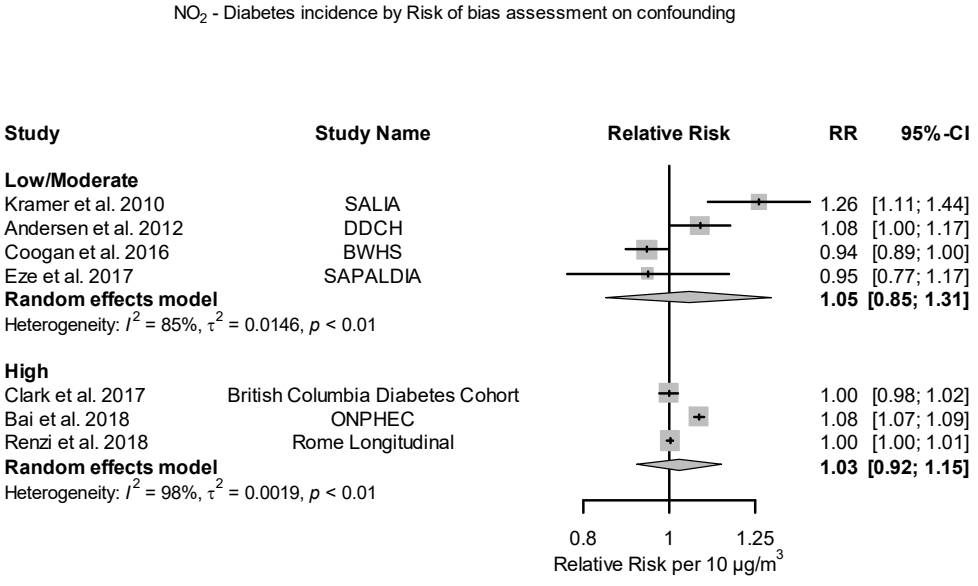


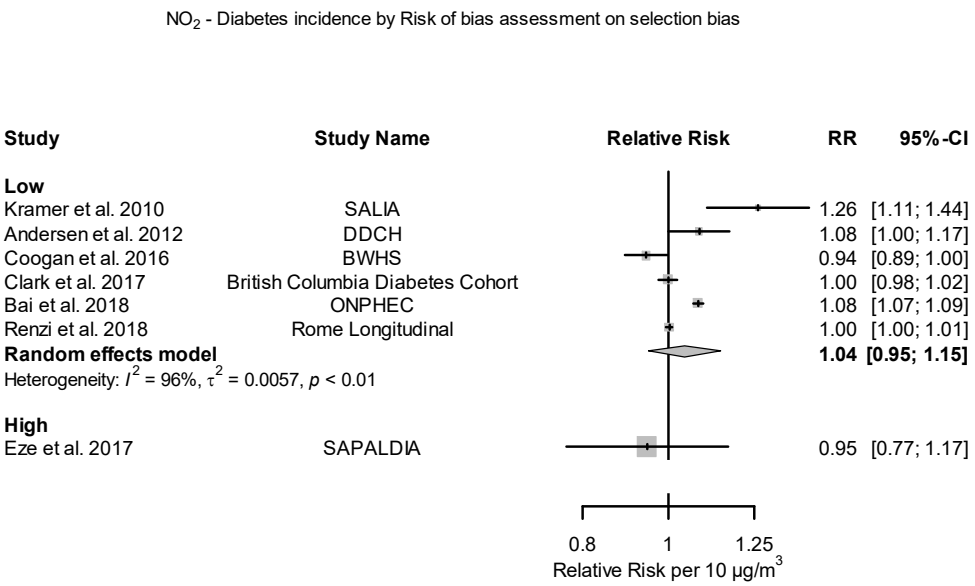
Subgroup analysis - by traffic specificity



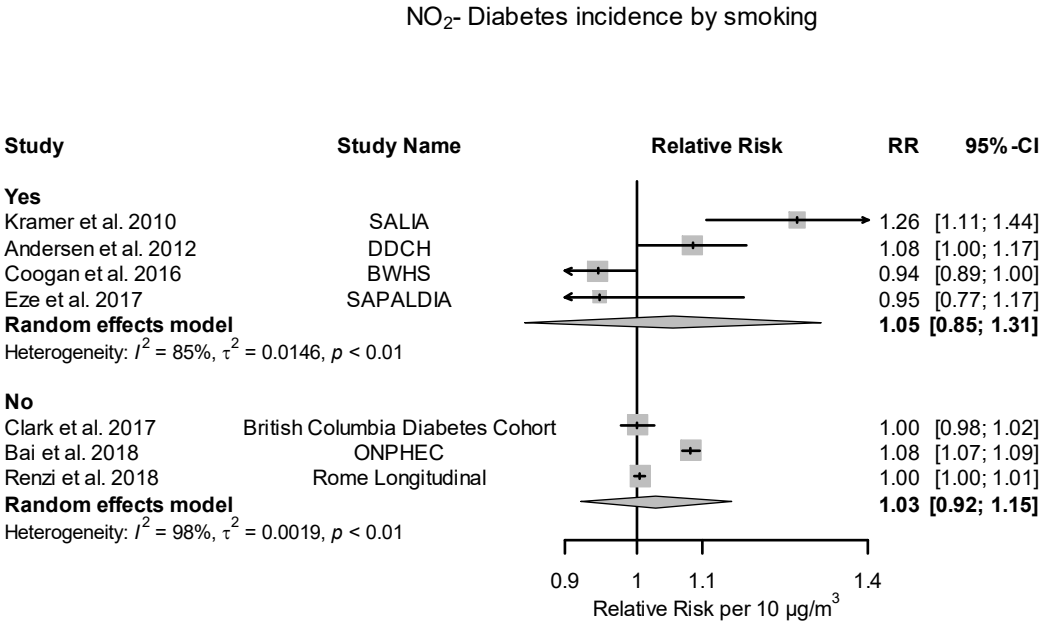
Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.



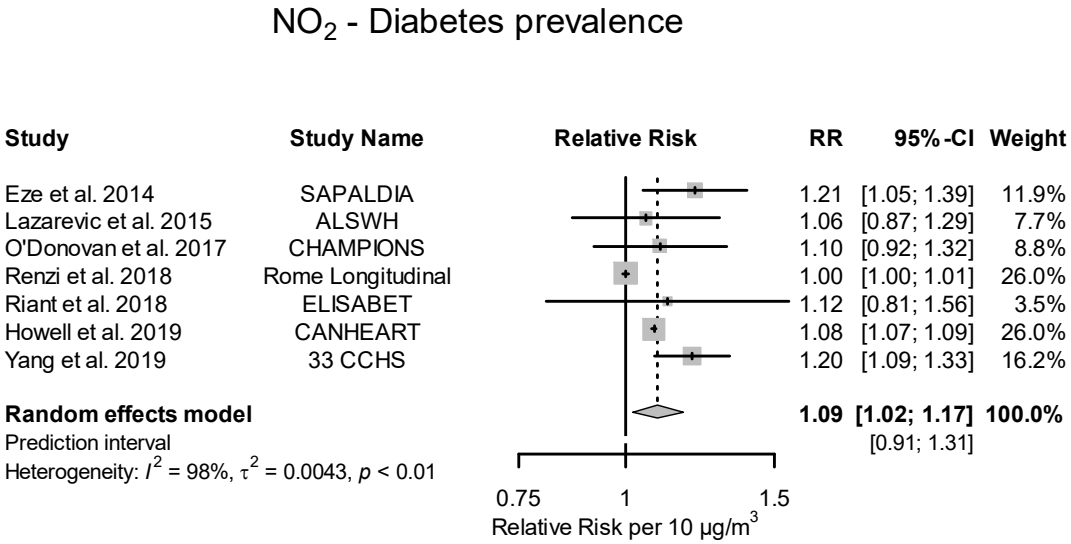


Subgroup analysis – by smoking adjustment



NO_2 - prevalence

Primary meta-analysis

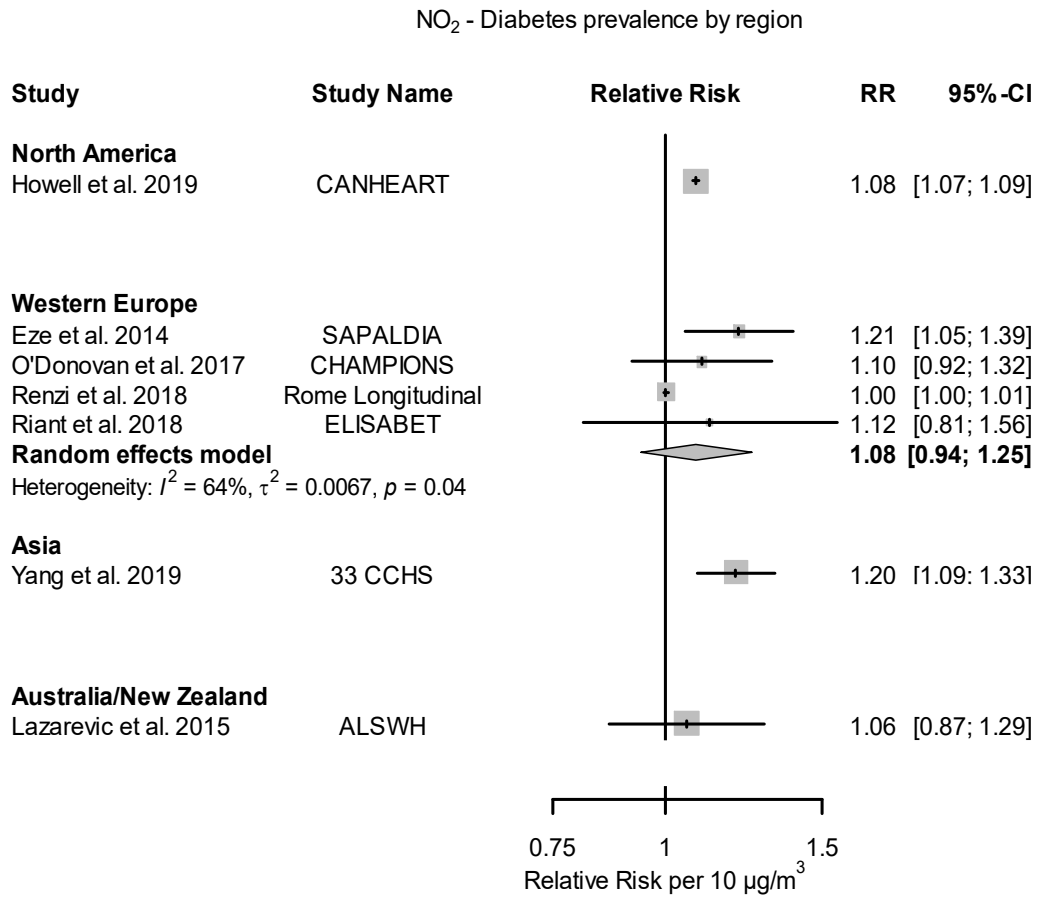


Subgroup analysis notes:

All were studies after 2008.

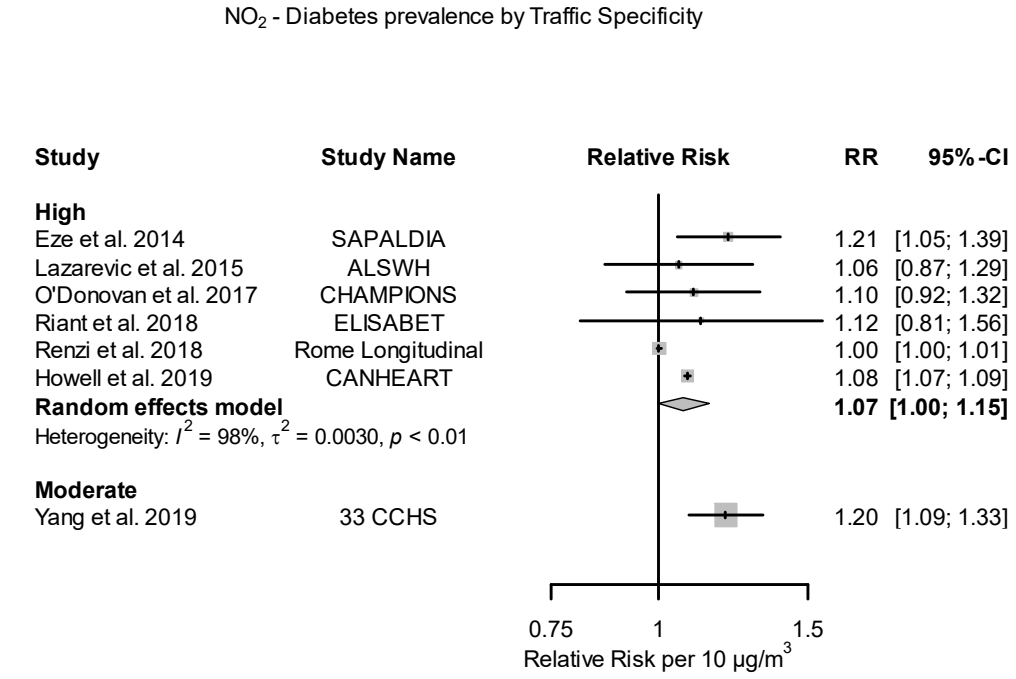
All were cross sectional studies.

Subgroup analysis - by region

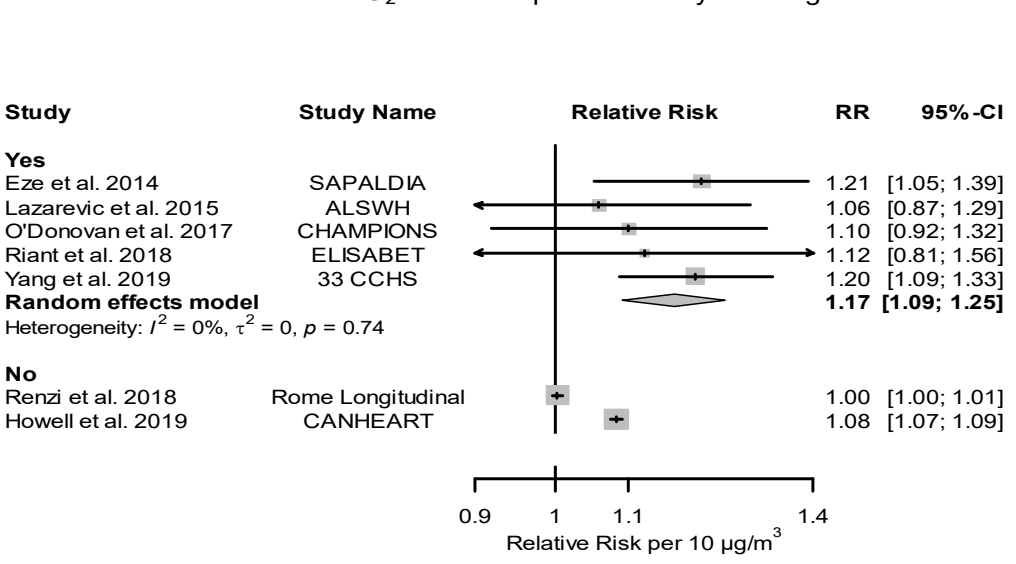


Subgroup analysis - by traffic specificity

Subgroup analysis - by smoking adjustment

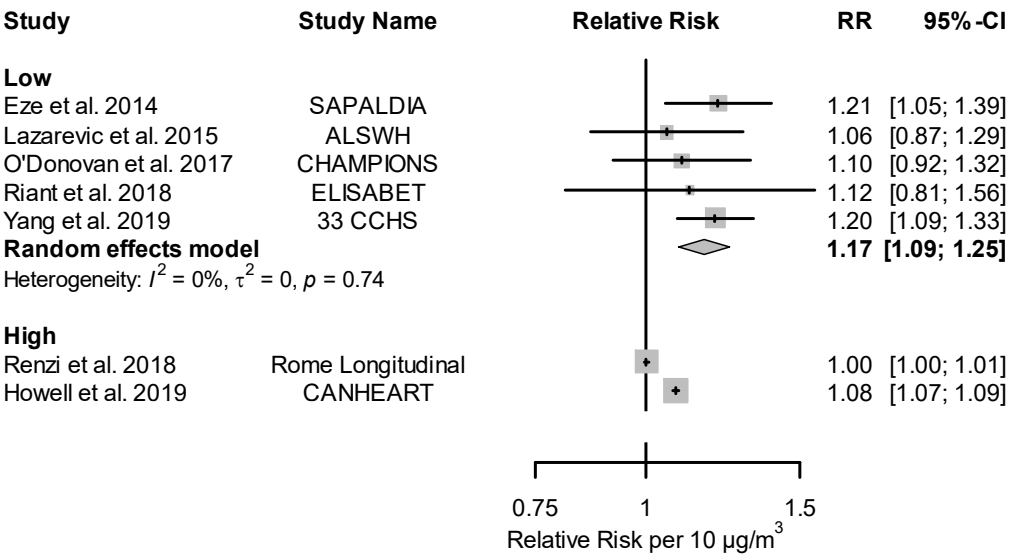


Subgroup analysis - by risk of bias

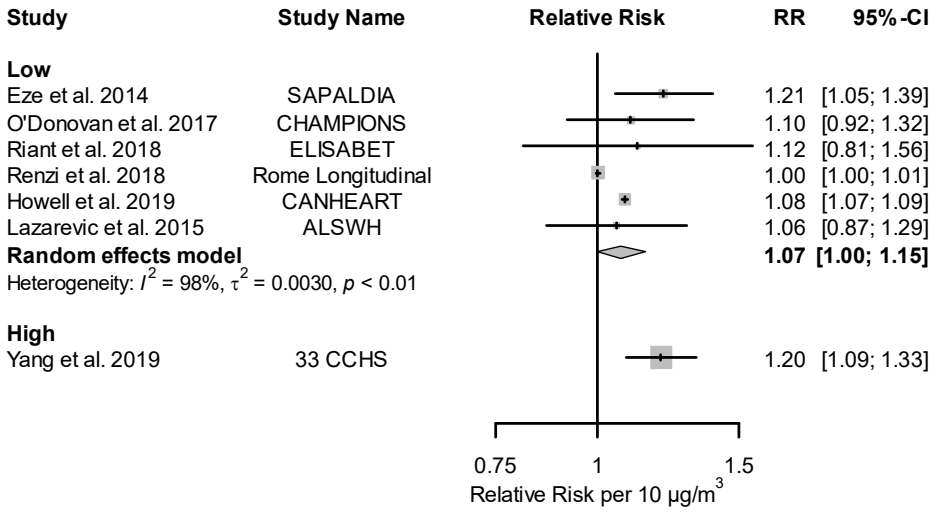


Plots not shown for risk of bias domains if all studies were rated low or moderate.

NO_2 - Diabetes prevalence by Risk of bias assessment on confounding

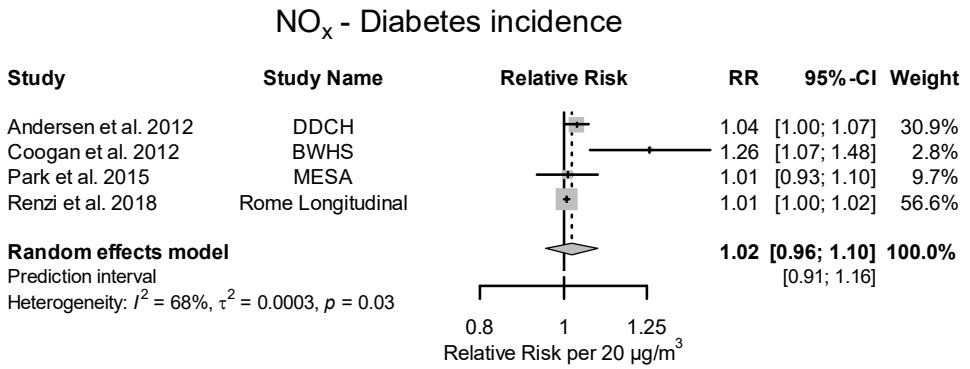


NO_2 - Diabetes prevalence by Risk of bias assessment on missing data



NO_x - Incidence

Primary meta-analysis



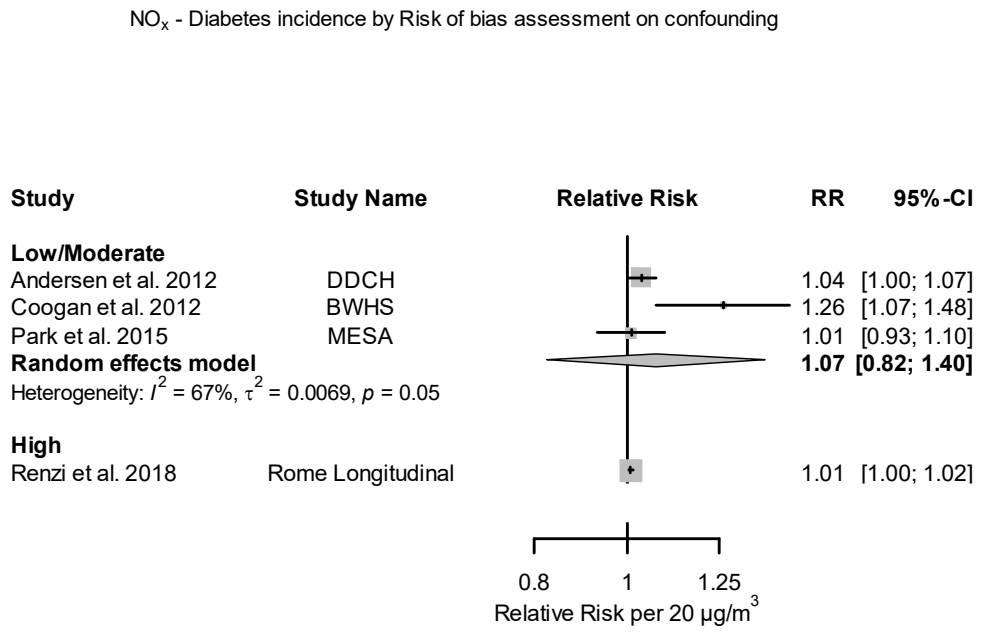
Subgroup analyses notes:

Andersen et al. 2012 and Renzi et al. 2018 are W. European cohorts while the other two studies are N. American studies.

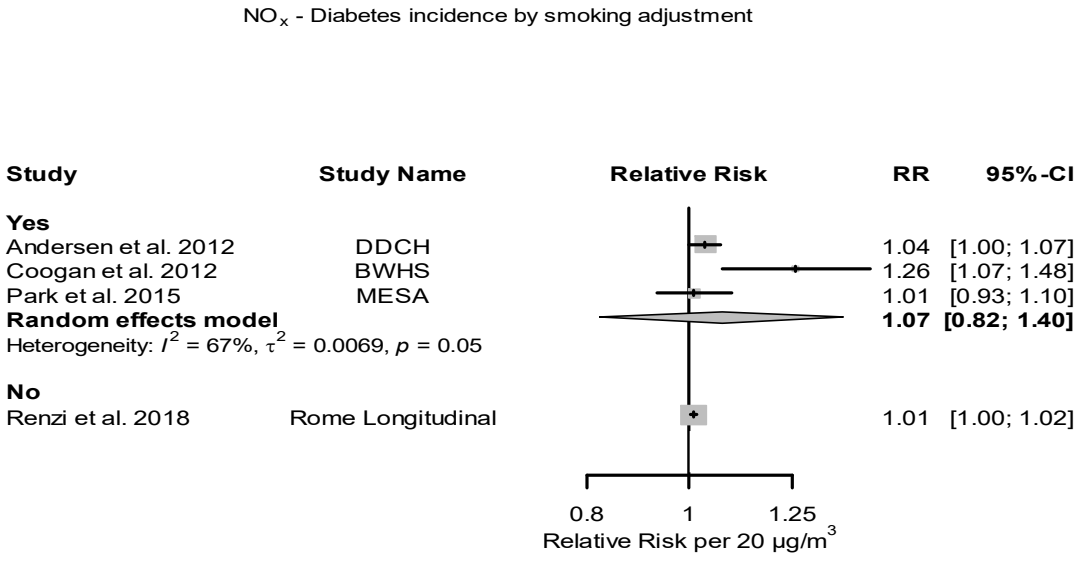
All are high traffic specificity studies.

Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.

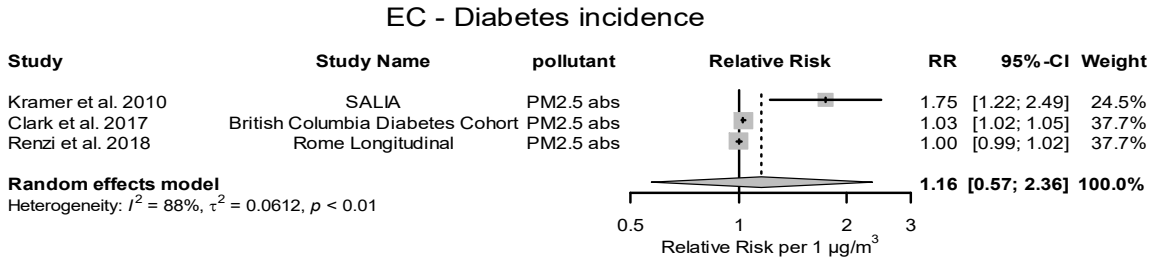


Subgroup analysis – by smoking adjustment



EC - incidence

Primary meta-analysis



Subgroup analyses notes:

Clark et al. 2017 is a N. American cohort, while the other two studies are W. European studies.

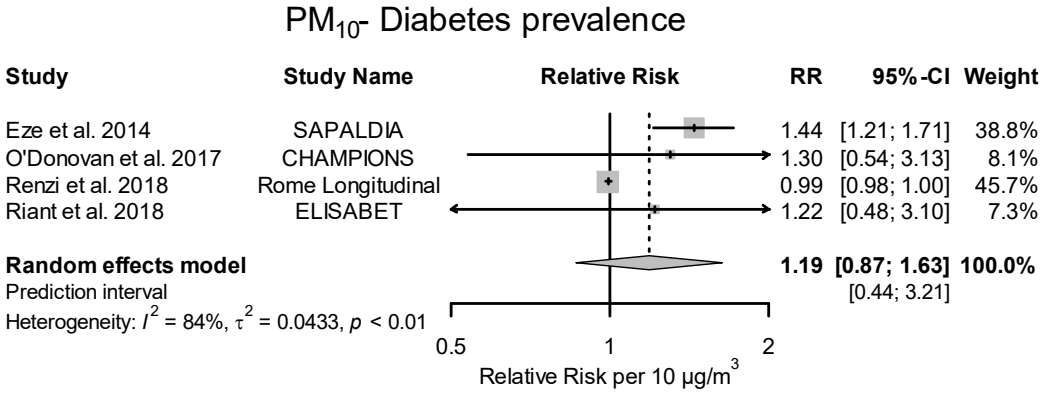
All rated high in traffic specificity.

Only Kramer et al. 2010 controlled for smoking.

All rated low or moderate for risk of bias domains except for risk of bias confounding where two studies were rated high risk of bias (Clark et al. 2017 and Renzi et al. 2018).

PM_{10} - Prevalence

Primary meta-analysis



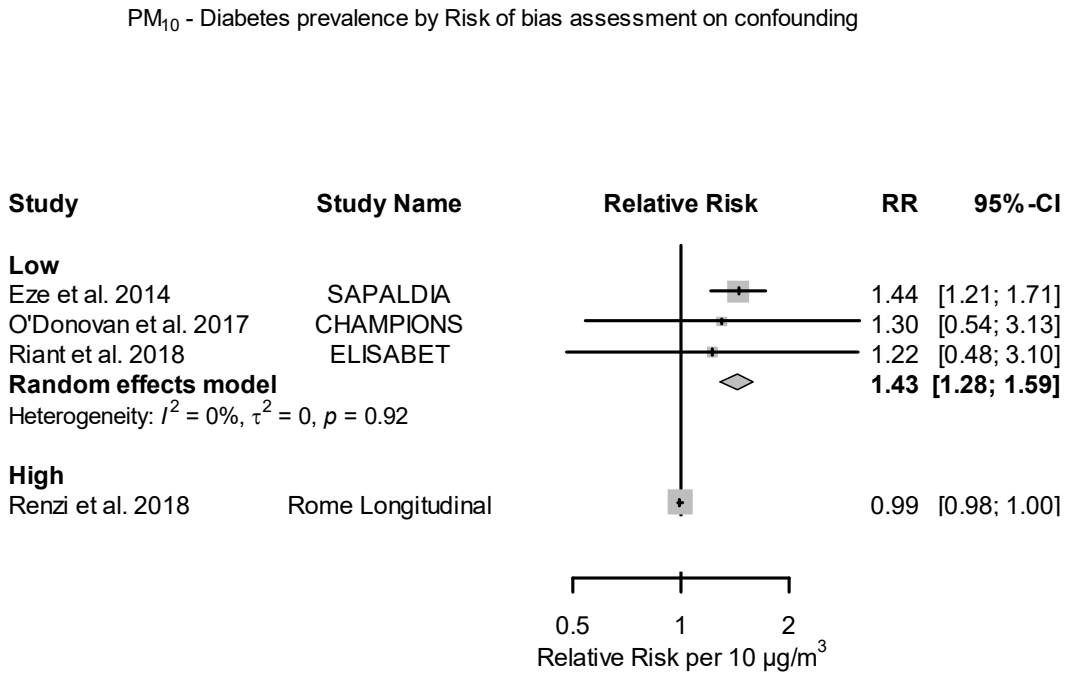
Subgroup analysis notes:

All are W. European cross sectional studies.

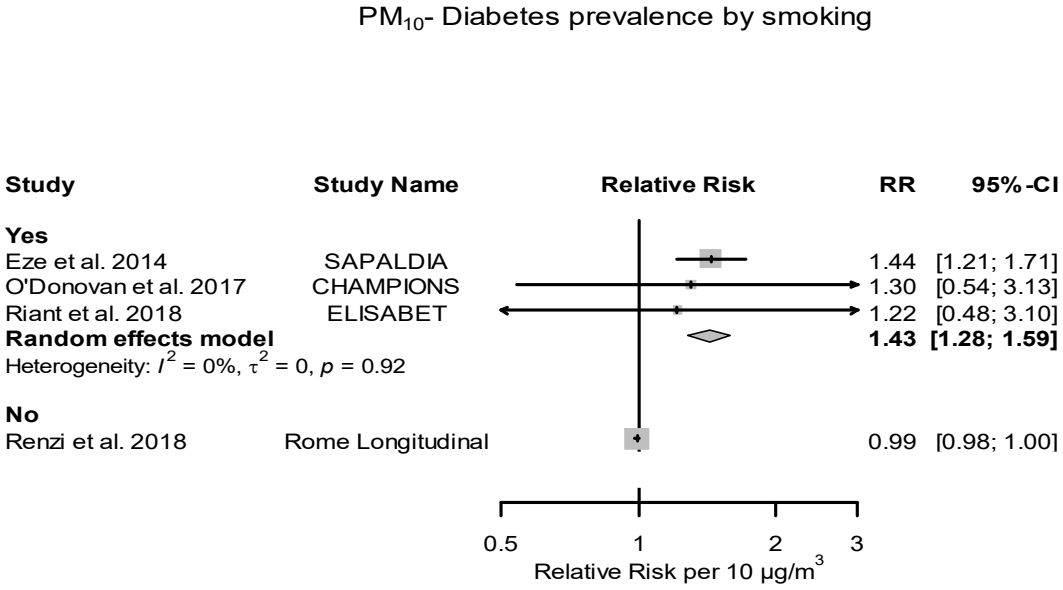
All studies rated moderate in traffic specificity.

Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.

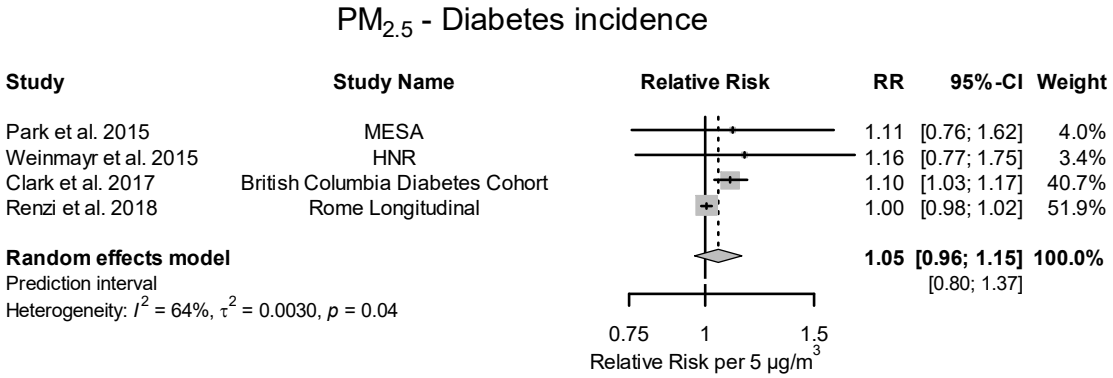


Subgroup analysis - by smoking adjustment



$PM_{2.5}$ - Incidence

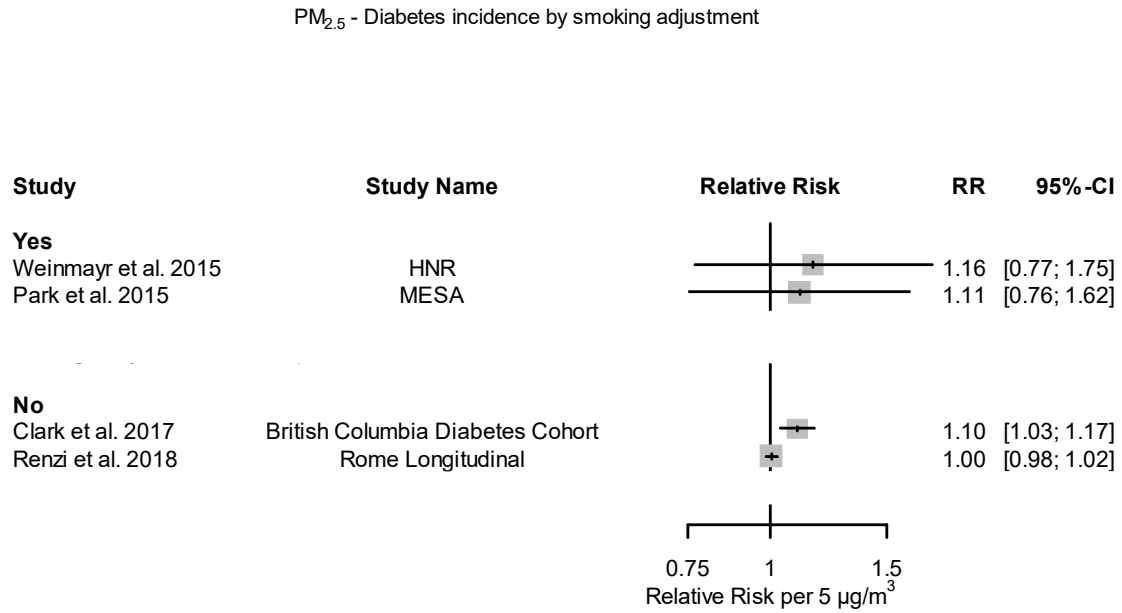
Primary meta-analysis



Subgroup analysis notes:
2 cohorts from N. America (Park et al. 2015 and Clark et al. 2017) and the other two studies from W. Europe.

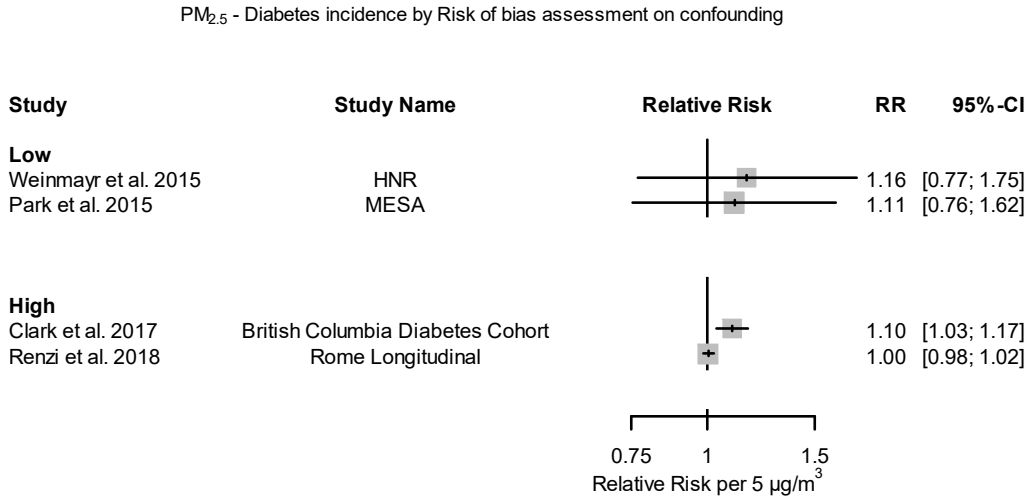
All studies rated moderate in traffic specificity.

Subgroup analysis - by smoking adjustment



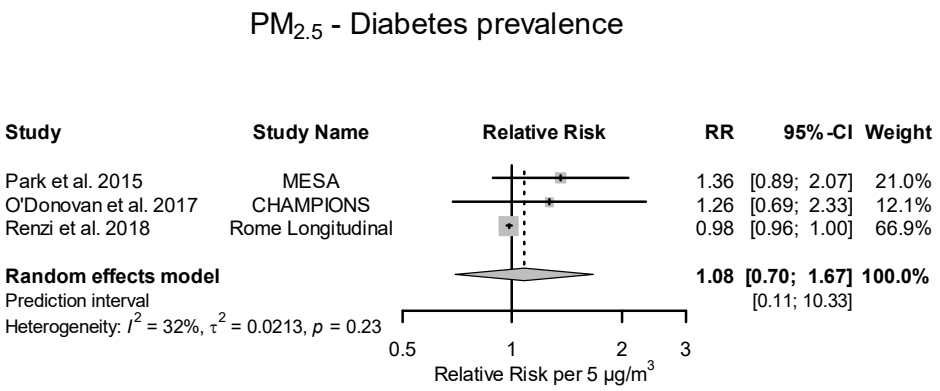
Subgroup analysis - by risk of bias

Plots not shown for risk of bias domains if all studies were rated low or moderate.



$PM_{2.5}$ - Prevalence

Primary meta-analysis

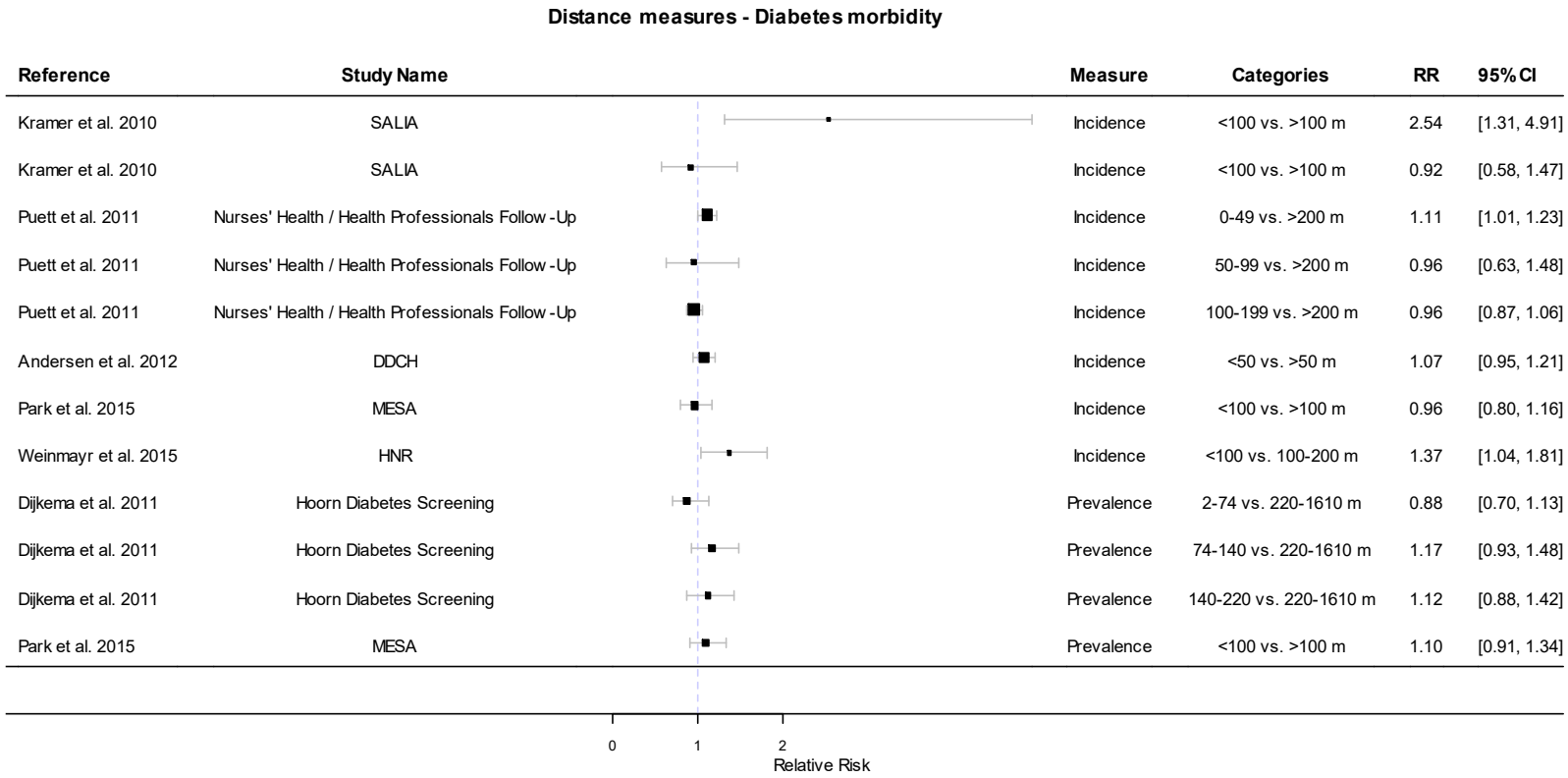


Subgroup analysis notes:
3 cohorts, of which 1 in N. America (Park et al. 2015) and 2 in W. Europe.

All $PM_{2.5}$ studies rated moderate in traffic specificity.

O'Donovan et al. 2017 did not control for smoking.

O'Donovan et al. 2017 was rated high risk of bias for confounding.



*SALIA estimates correspond to low and high education, respectively.

Traffic Density measures - Diabetes morbidity