



## **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 14: Discussion and Conclusions**

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

---

Correspondence concerning the Special Report may be addressed to Dr. Hanna Boogaard at Health Effects Institute, 75 Federal Street, Suite 1400, Boston, Massachusetts, 02110; email: [jboogaard@healtheffects.org](mailto:jboogaard@healtheffects.org).

Although this document was produced with partial funding by the United States Environmental Protection Agency under Assistance Award CR-83467701 to the Health Effects Institute, it has not been subjected to the Agency's peer and administrative review and therefore may not necessarily reflect the views of the Agency, and no official endorsement by it should be inferred. The contents of this document also have not been reviewed by private party institutions, including those that support the Health Effects Institute; therefore, it may not reflect the views or policies of these parties, and no endorsement by them should be inferred.

© 2022 Health Effects Institute, 75 Federal Street, Suite 1400, Boston, MA 02110

## **Chapter 14: Discussion and Conclusions**

### **Additional Materials**

#### 14.1 HEI Traffic Review Plots for Examination of Potential Publication Bias

#### Purpose

According to OHAT, publication bias should be suspected when there are early positive studies (or negative for birth weight), especially when studies are small. Plots of statistical significance of results for number of participants and study year were developed to further explore potential publication bias. These plots are considered a supplement to the funnel plots and Eggers tests, and to inform the OHAT assessment regarding whether earlier or smaller studies were more likely to have positive results.

#### Methods

Check the location of the confidence interval relative to unity for ratios (or zero for mean difference, beta, and % change). If the lower and upper estimates are greater than the test value (1 or 0), the statistical significance is "Positive". If the lower and upper estimates are less than the test value, the statistical significance is "Negative". Otherwise, the confidence intervals cross the test value and the statistical significance is "No effect". Plots show the number of participants versus publication year, with colors and symbols representing the statistical significance of results. Where studies reported mixed results, all applicable symbols are shown; only one of each symbol is included per study per panel. Separate plots are shown for all studies and for only those included in meta-analysis.

#### Results and Interpretation

Results are shown in Figures 1-12. Many studies reported at least one effect estimate with results of "No effect". The Panel thought that one statistically significant result might be an impetus to publish the study even if the other pollutants did not have statistically significant results, and that the large number of null effect studies were an argument against publication bias.

The direction of effect changed over the years for COPD and preterm birth. For COPD ever, there were two positive studies in 2000-2003 and, four negative (slightly larger) studies in later years. However, no meta-analysis was conducted for this outcome. For PTB, there are lots of early positive statistically significant results and more recent results of negative statistical significance in the plot of all studies. Interestingly, these patterns disappear in the plots containing only those effect estimates included in the meta-analysis.

The Panel concluded that there does not appear to be evidence for widespread systematic publication bias in the literature summarized in the review.

All studies by Subgroup

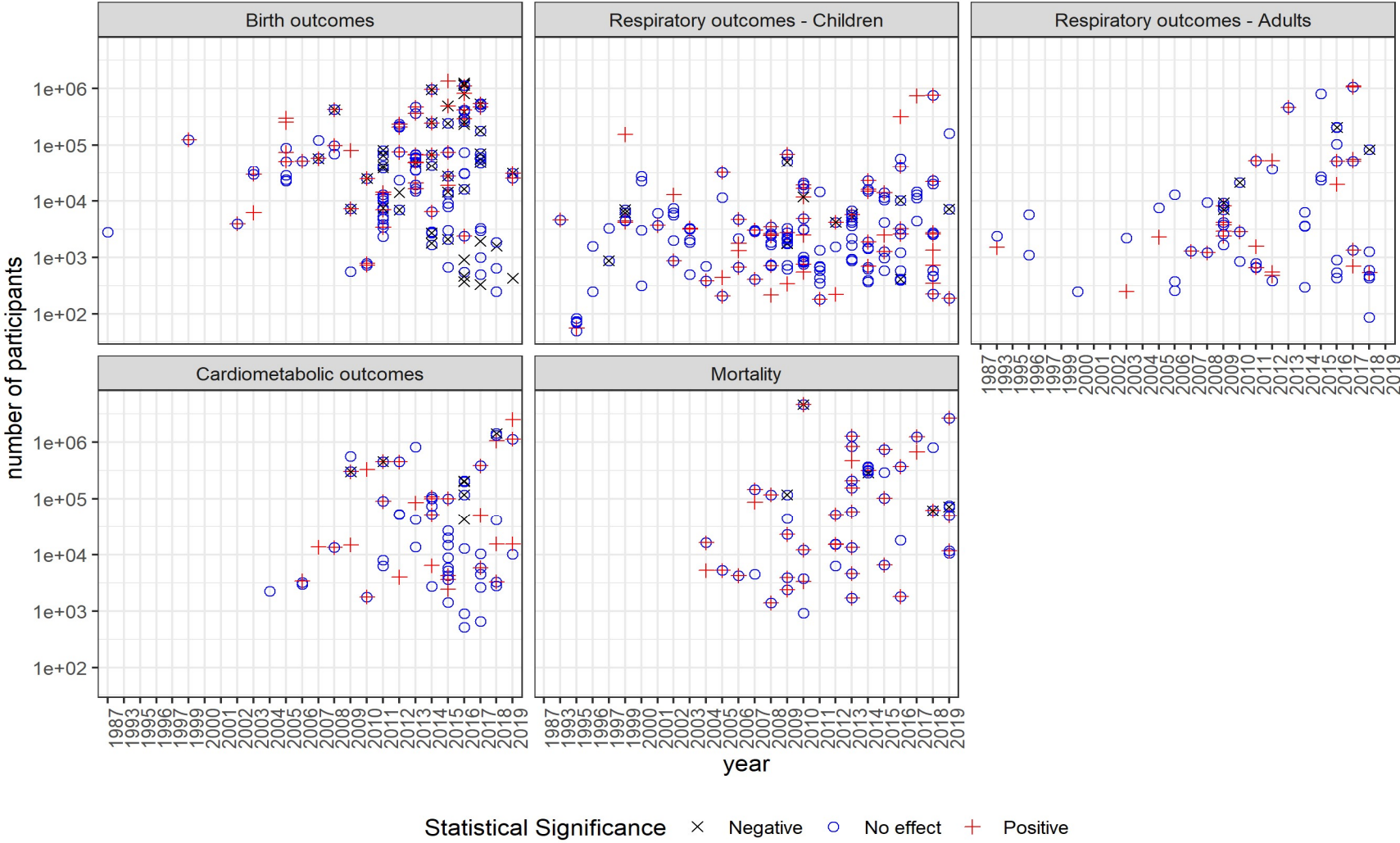


Figure 1. Statistical significance of results by number of participants and year for each subgroup. All studies included.

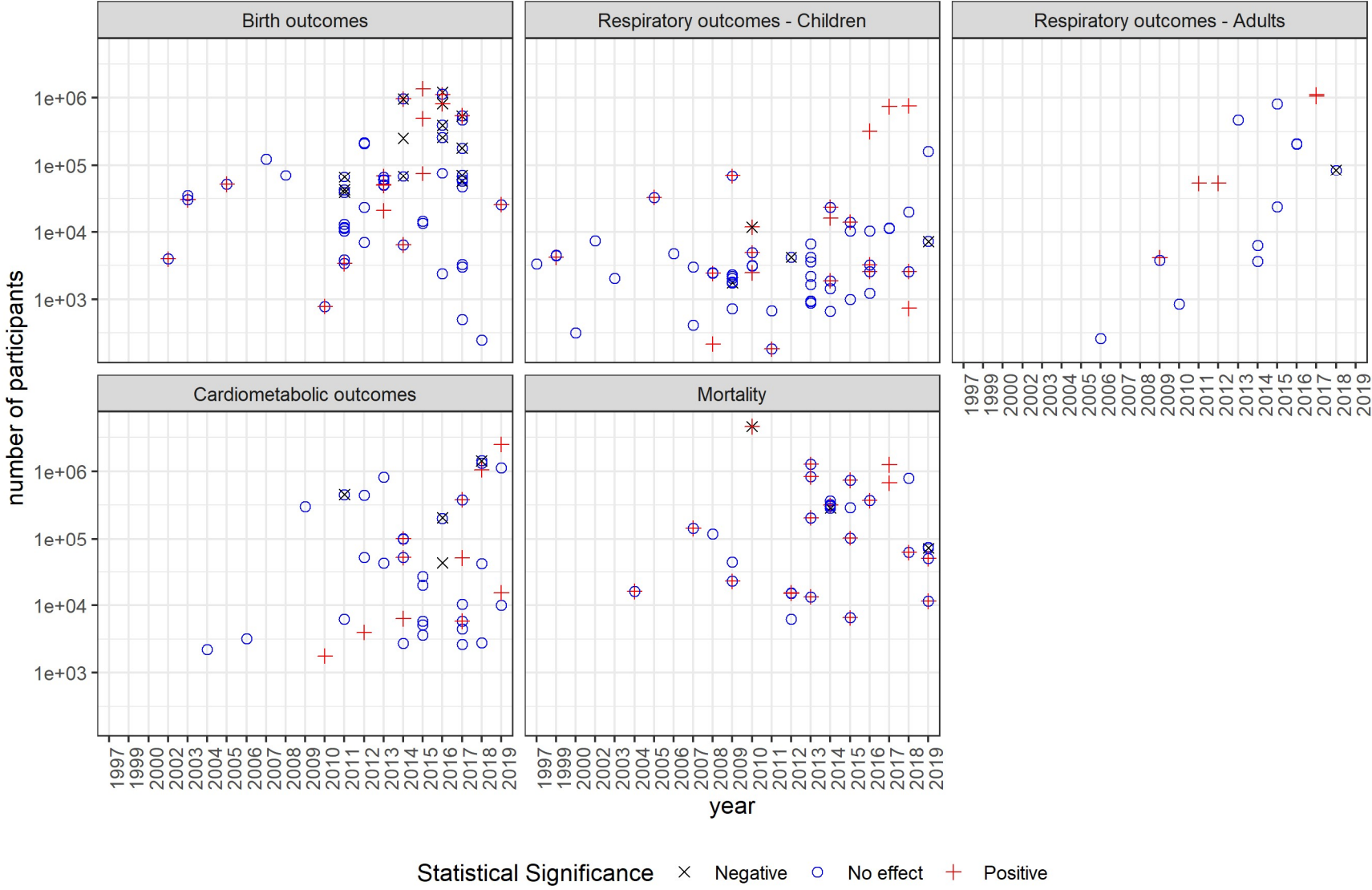


Figure 2. Statistical significance of results by number of participants and year for each subgroup. Only studies in meta-analysis are included.

Birth Outcomes

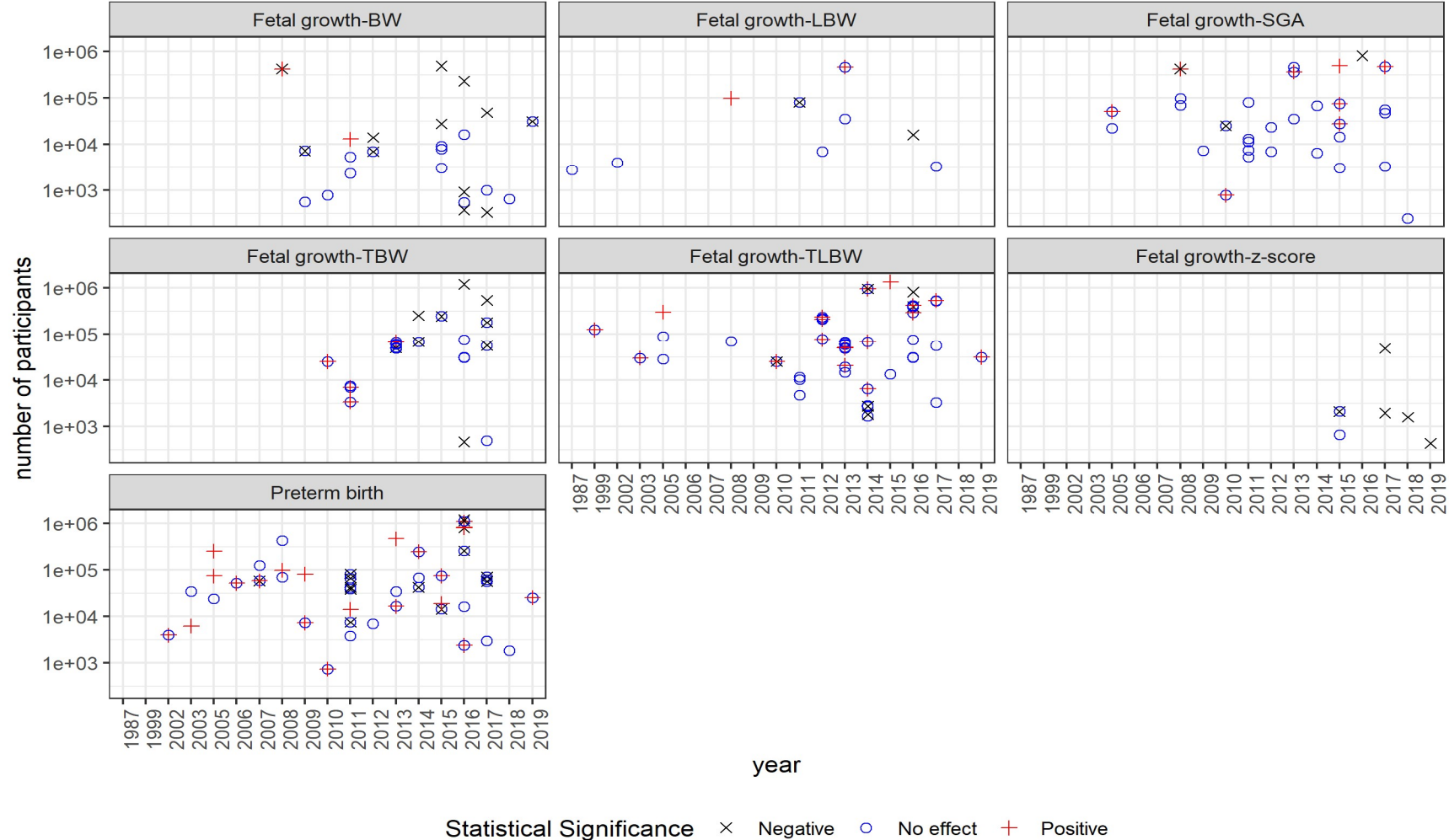
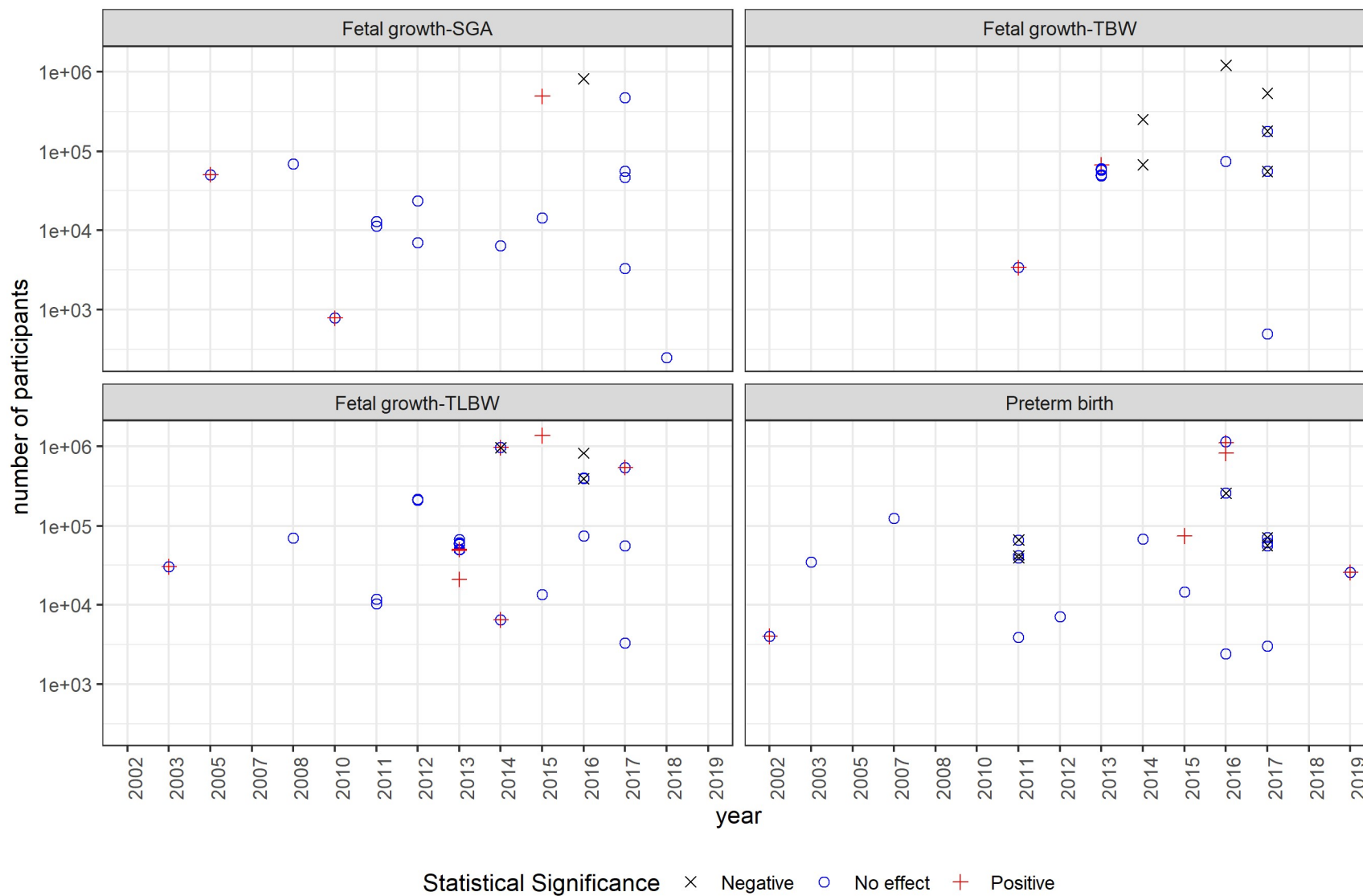
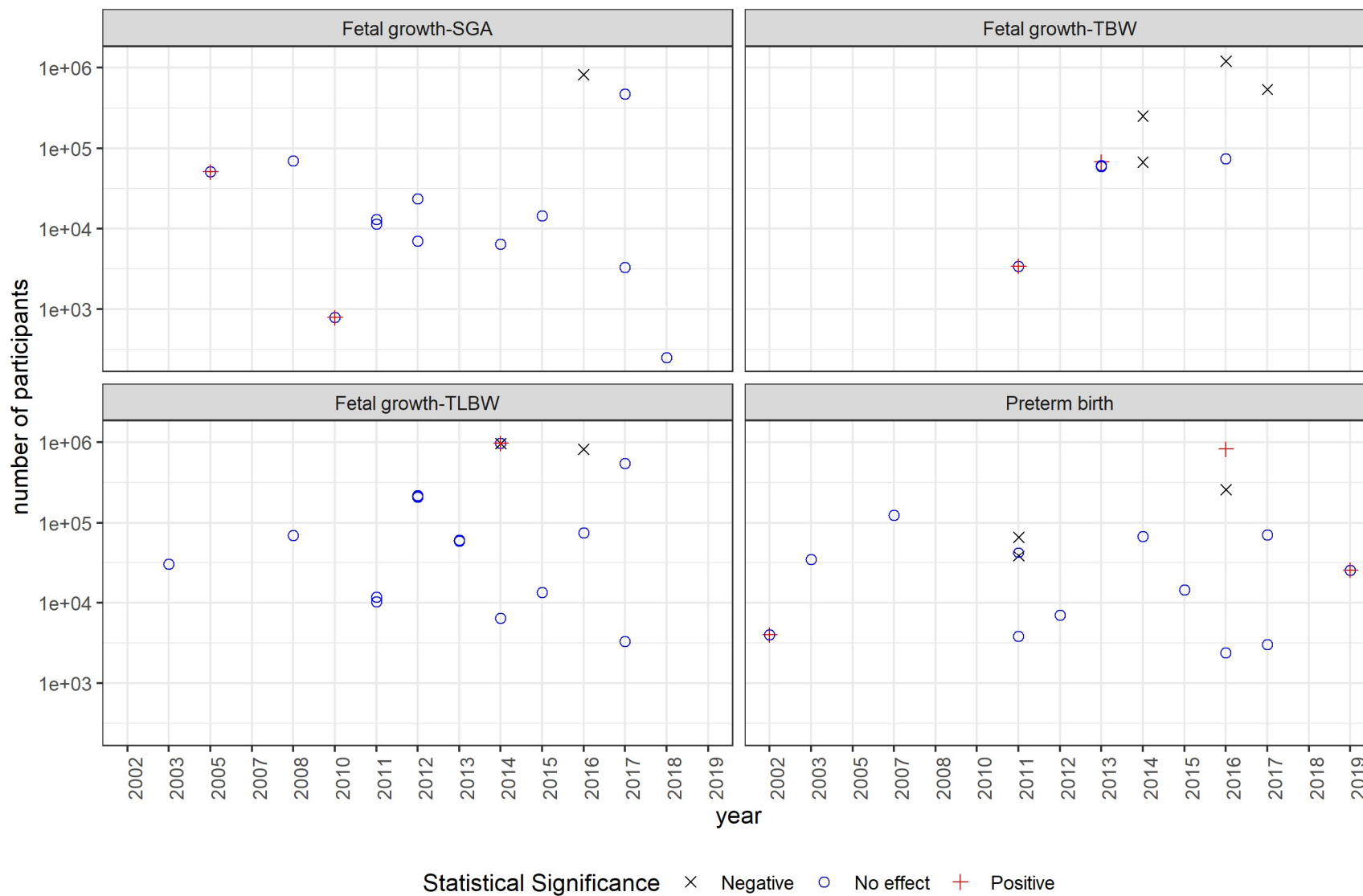


Figure 3. Statistical significance of results by number of participants and year for each birth outcome included in the review, with colors representing statistical significance of results. All studies included.

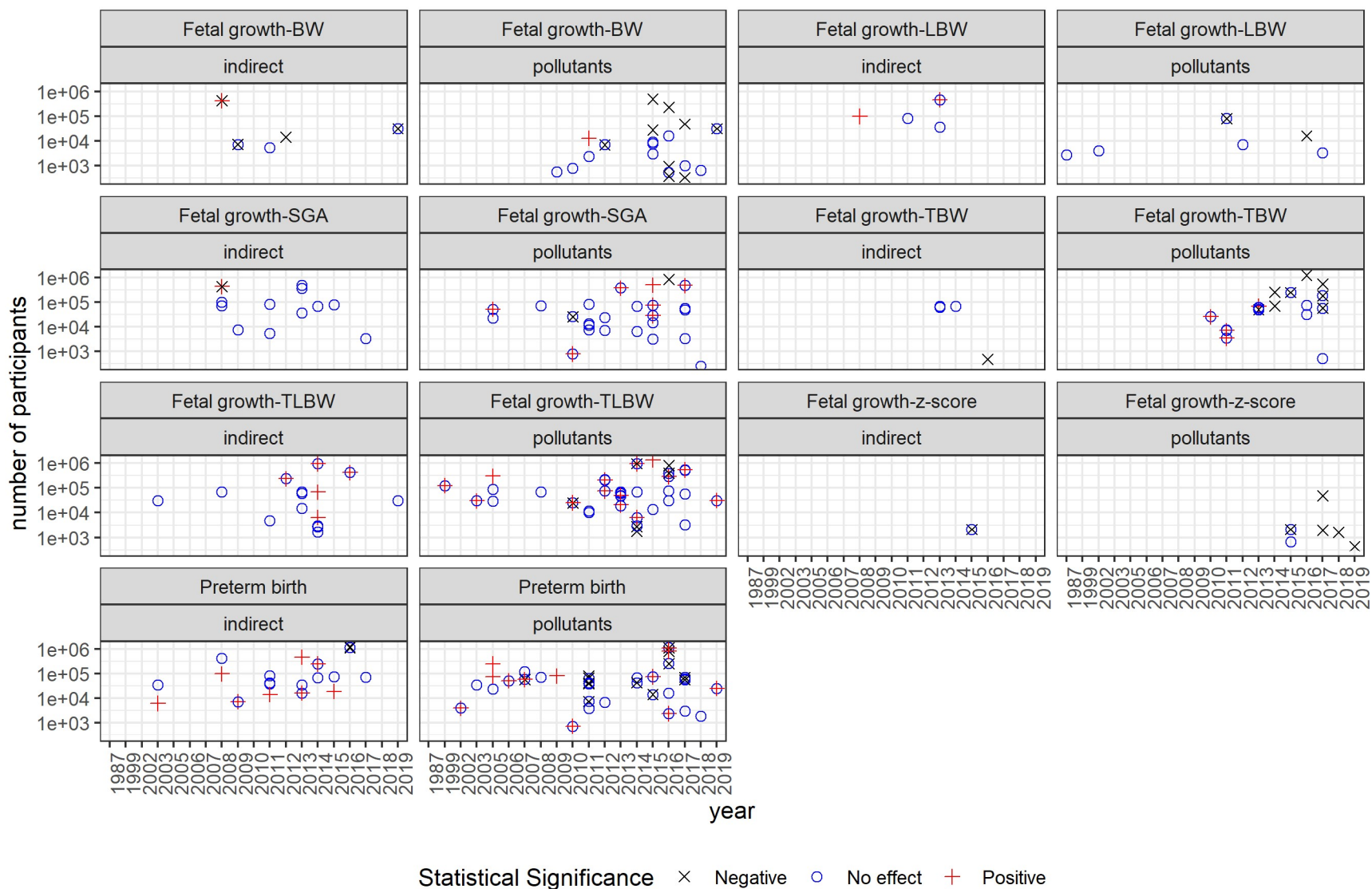


**Figure 4.** Statistical significance of results by number of participants and year for each **birth outcome** included in the review. Only studies included in **meta-analysis** are included.



**Figure 5.** Statistical significance of results by number of participants and year for each **birth outcome** included in the review. Only results for **NO<sub>2</sub>** associations included in **meta-analysis** are included.





**Figure 6.** Statistical significance of results by number of participants and year for each **birth outcome** included in the review. **All effect estimates** are included with panels stratified by use of **indirect measures versus pollutants** as exposure indicators.

Respiratory Outcomes in Children

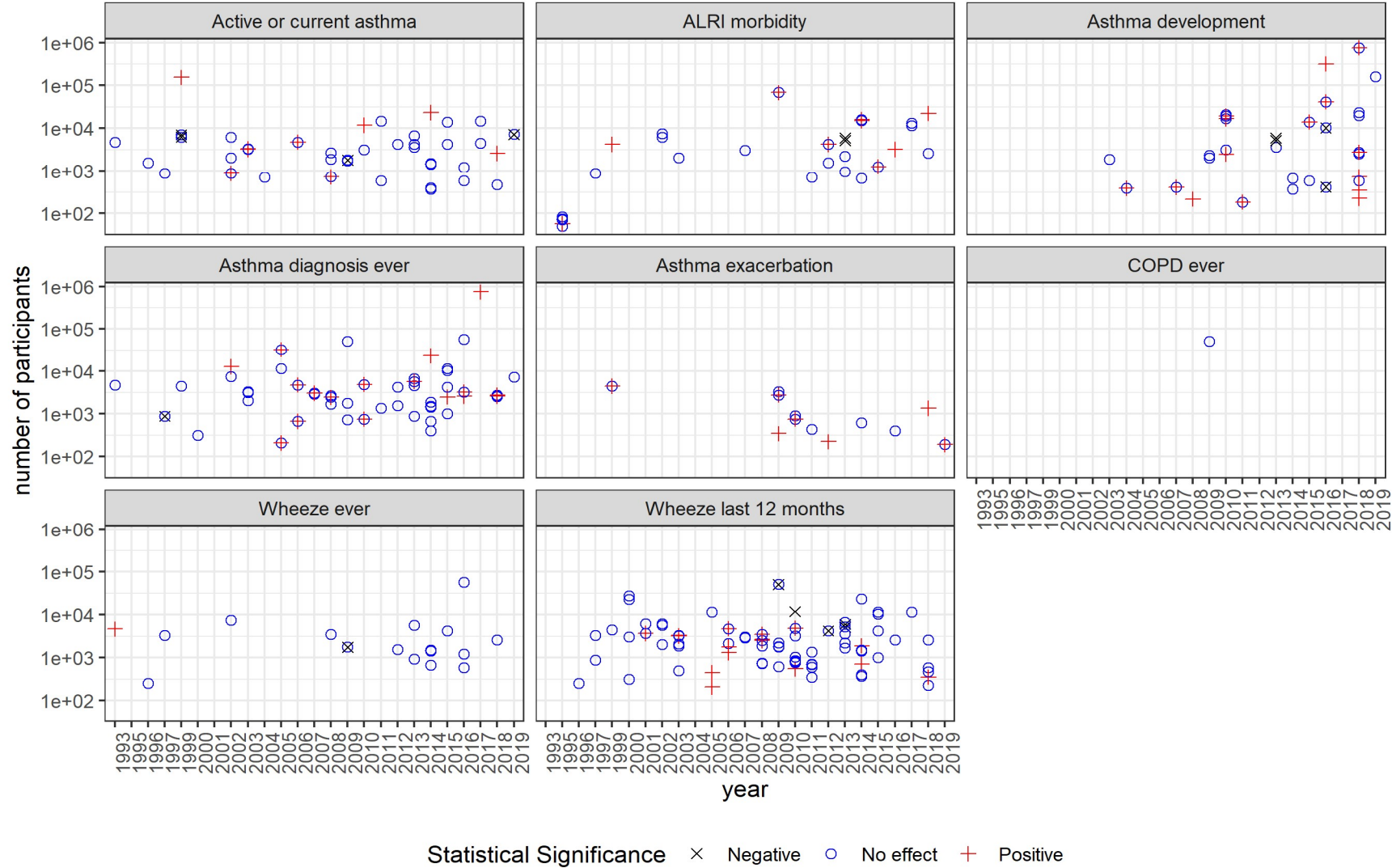
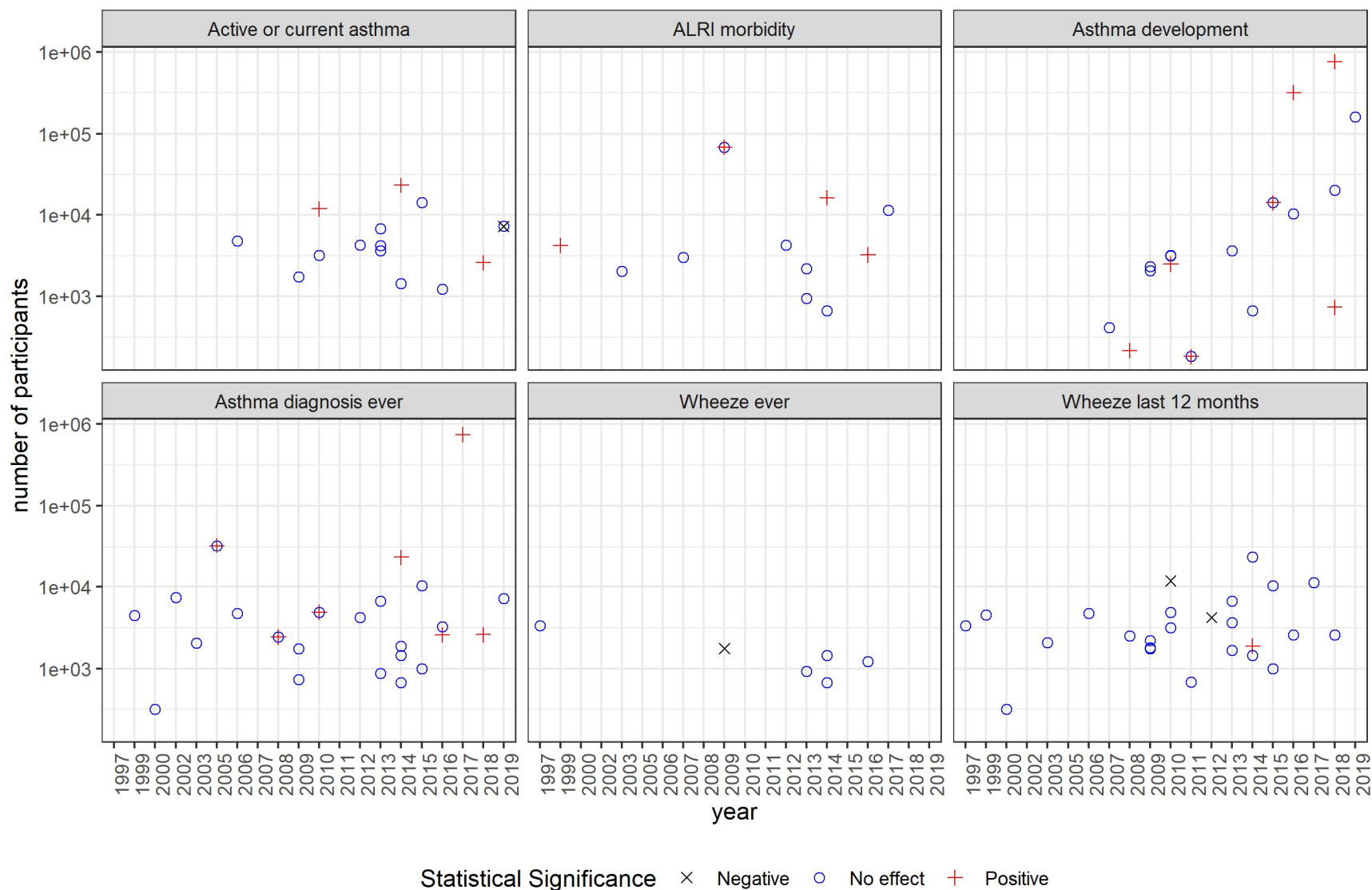
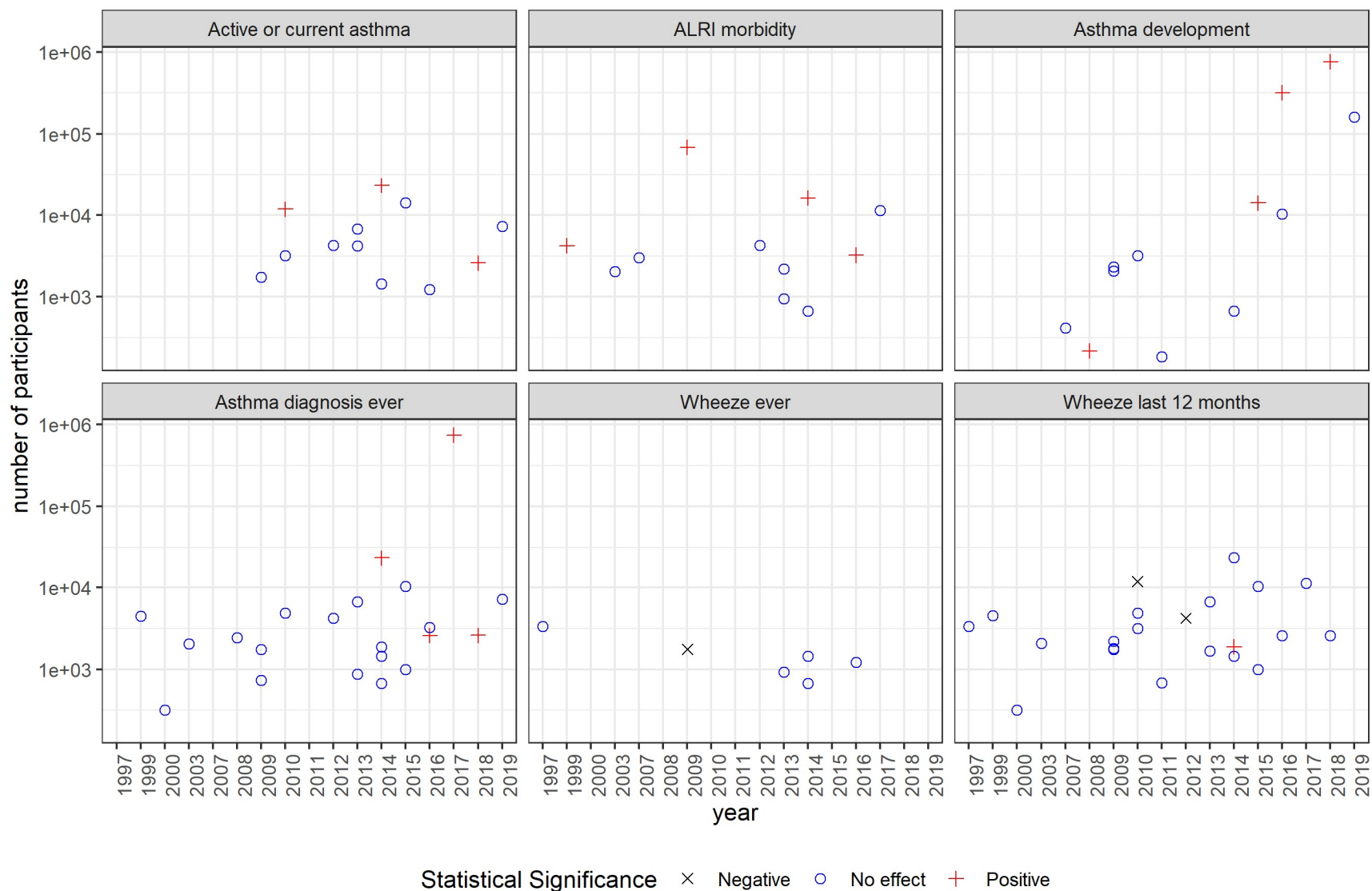


Figure 7. Number of study participants for each respiratory outcome in children included in the review. All studies included.

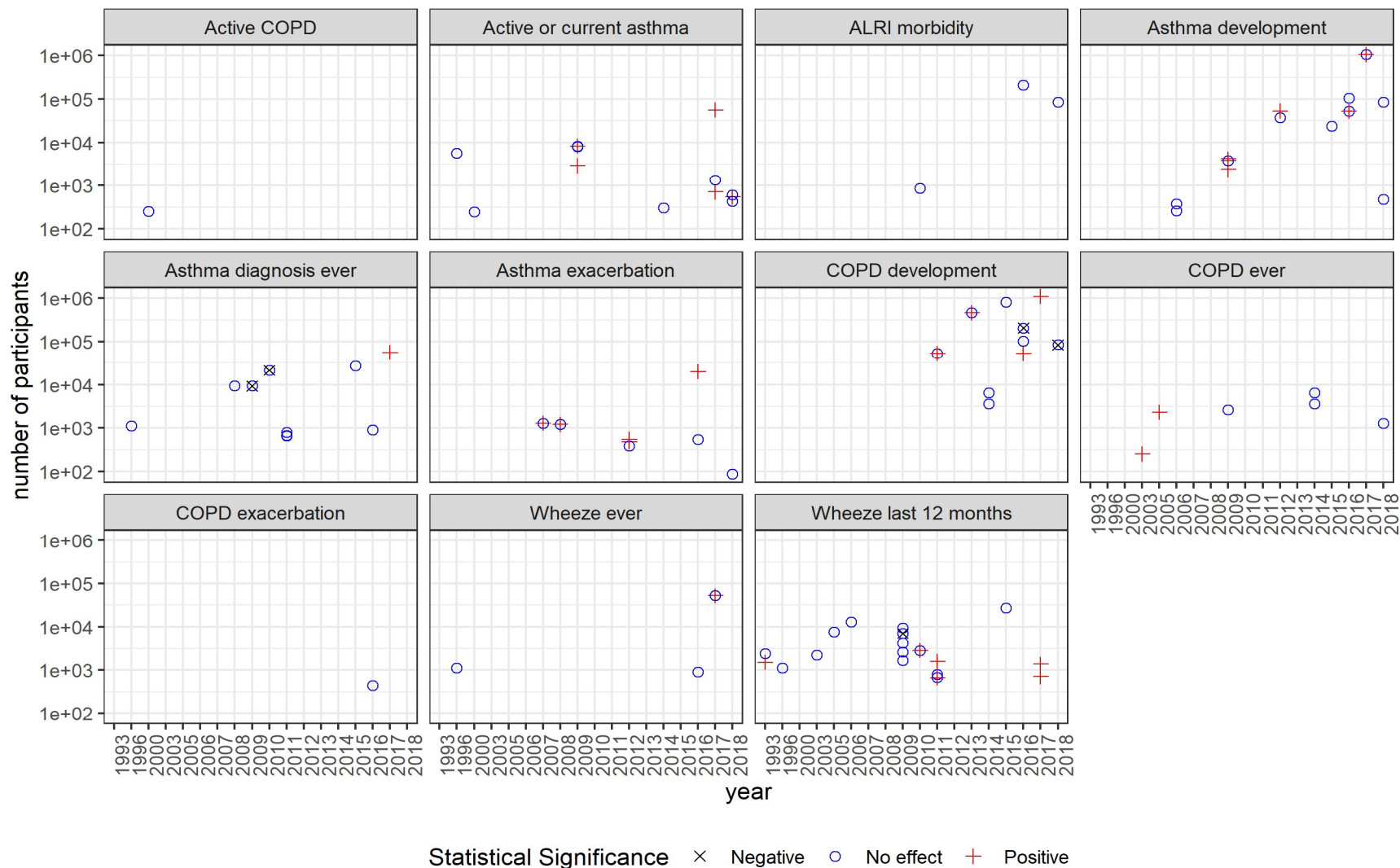


**Figure 8.** Statistical significance of results by number of participants and year for each **respiratory outcome in children** included in the review. Only studies included in **meta-analysis** are included.

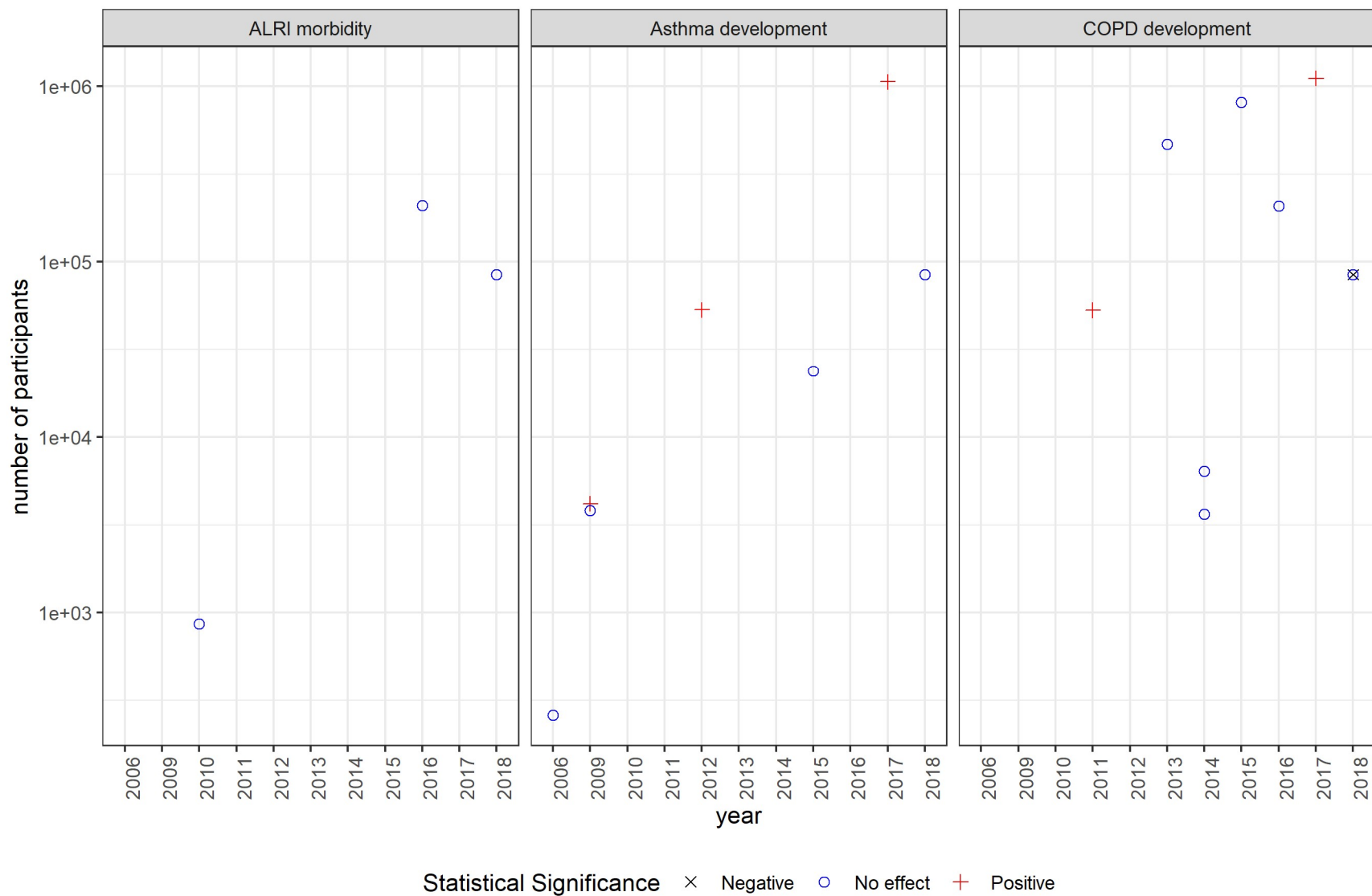


**Figure 9.** Statistical significance of results by number of participants and year for each **respiratory outcome in children** included in the review. Only results for **NO<sub>2</sub>** associations included in **meta-analysis** are included.

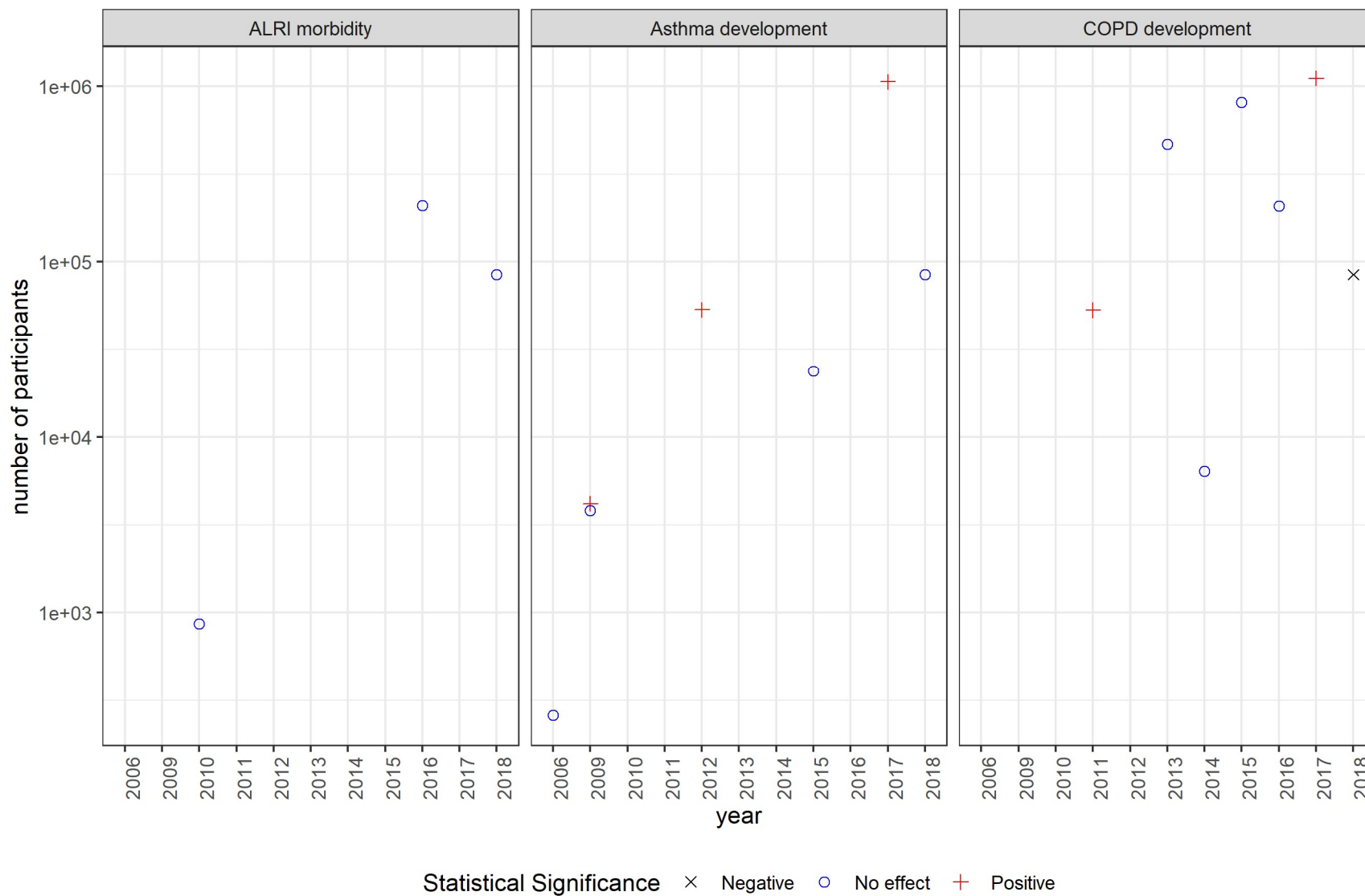
Respiratory Outcomes in Adults



**Figure 10.** Statistical significance of results by number of participants and year for each **respiratory outcome in adults** included in the review. **All studies included.**



**Figure 11.** Statistical significance of results by number of participants and year for each **respiratory outcome in adults** included in the review. Only studies included in **meta-analysis** are included.



**Figure 12.** Statistical significance of results by number of participants and year for each **respiratory outcome in adults** included in the review. Only results for **NO<sub>2</sub>** associations included in **meta-analysis** are included.

Cardiometabolic Outcomes

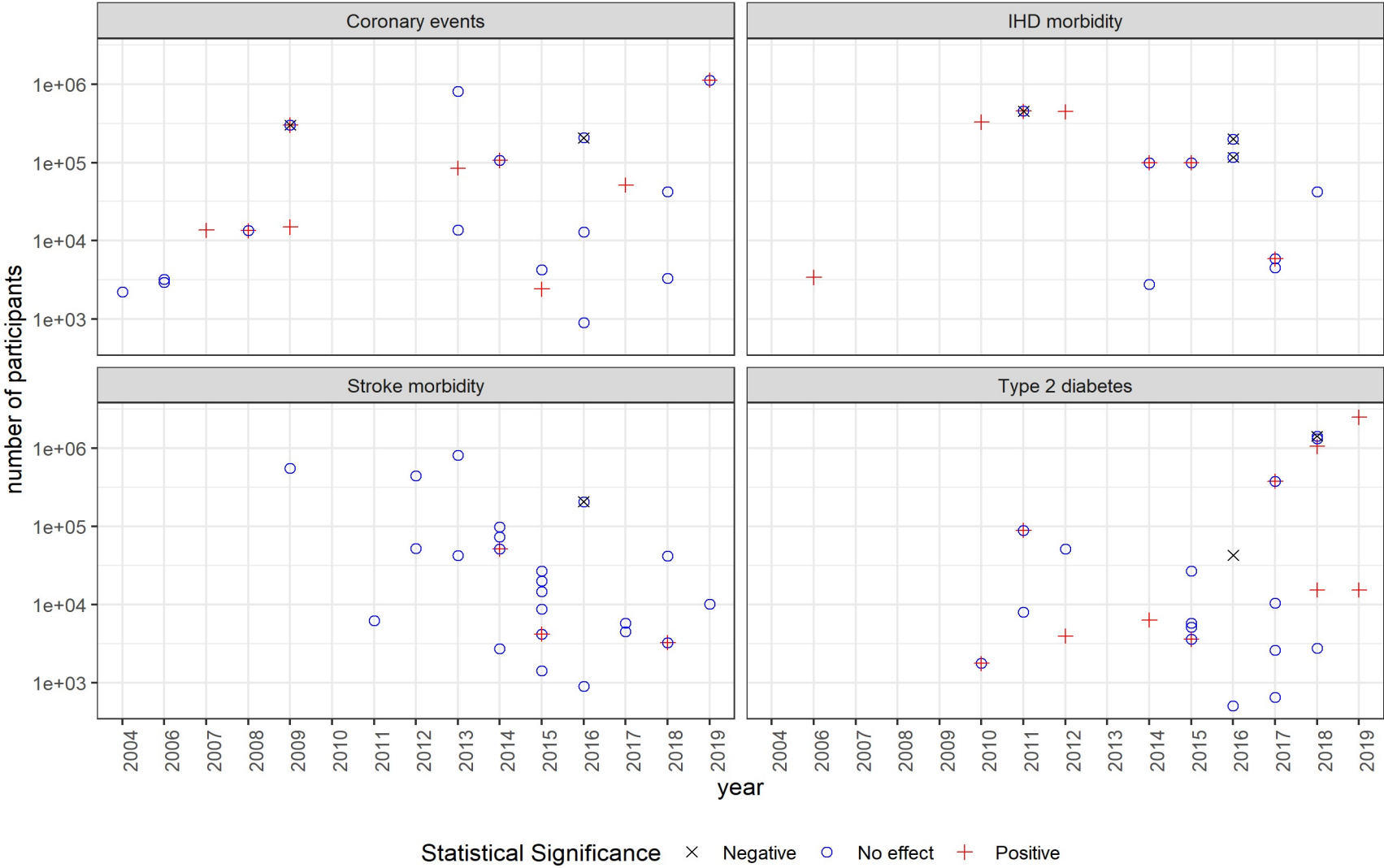
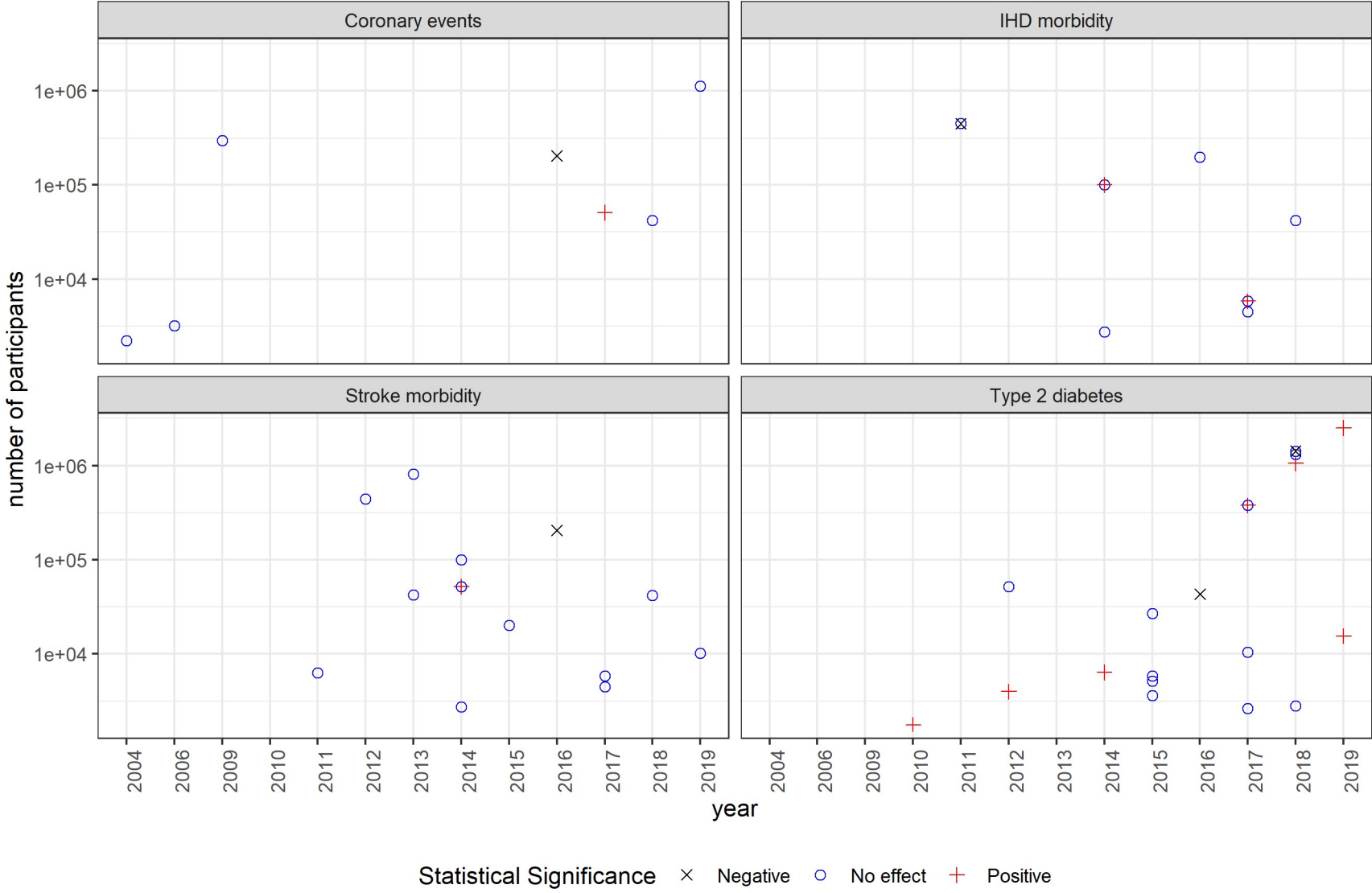
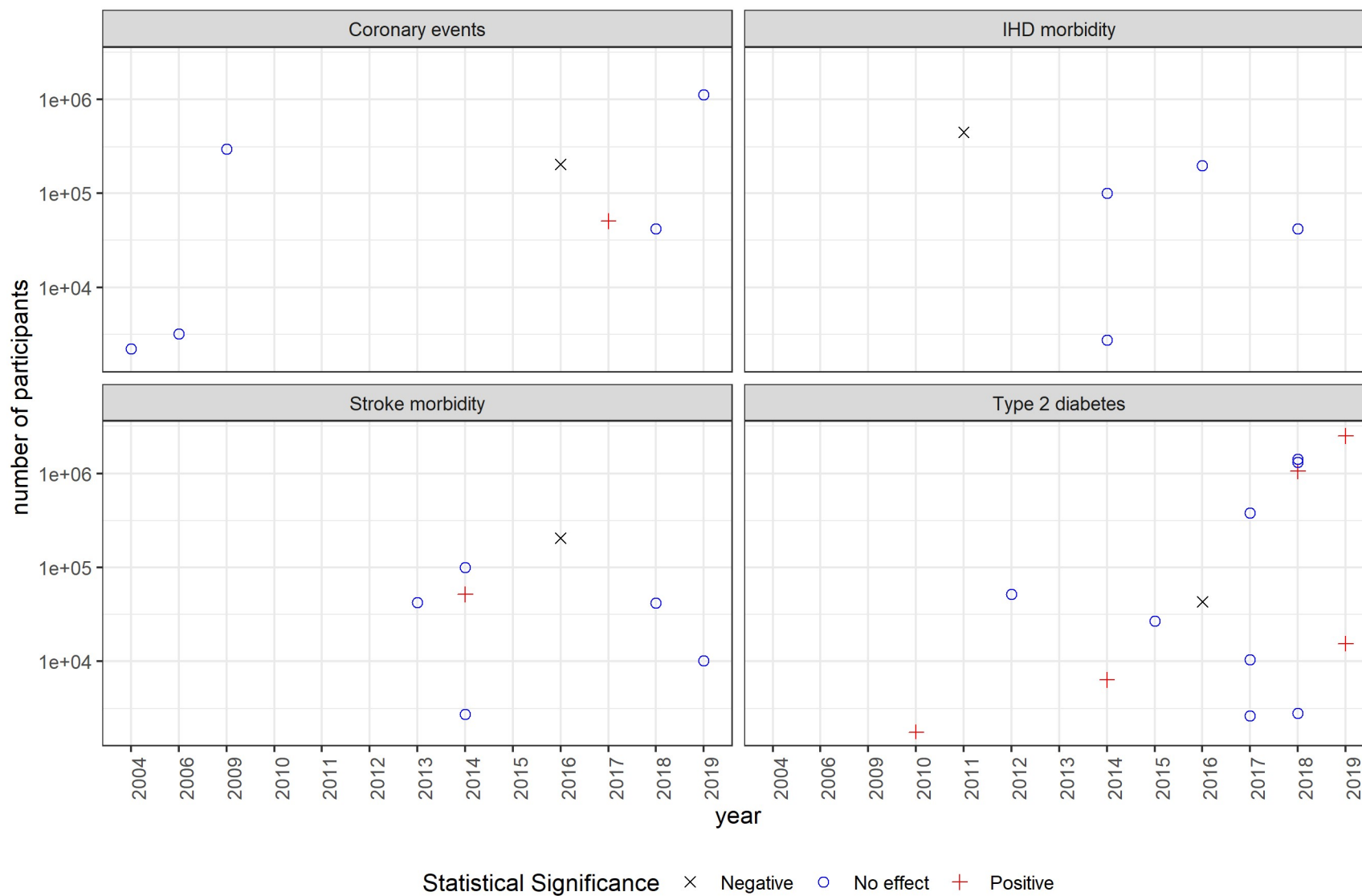


Figure 13. Statistical significance of results by number of participants and year for each cardiometabolic outcome included in the review. All studies included.





**Figure 14.** Statistical significance of results by number of participants and year for each **cardiometabolic outcome** included in the review. Only studies included in **meta-analysis** are included.



**Figure 15.** Statistical significance of results by number of participants and year for each **cardiometabolic outcome** included in the review. Only results for **NO<sub>2</sub>** associations included in **meta-analysis** are included.

Mortality Outcomes

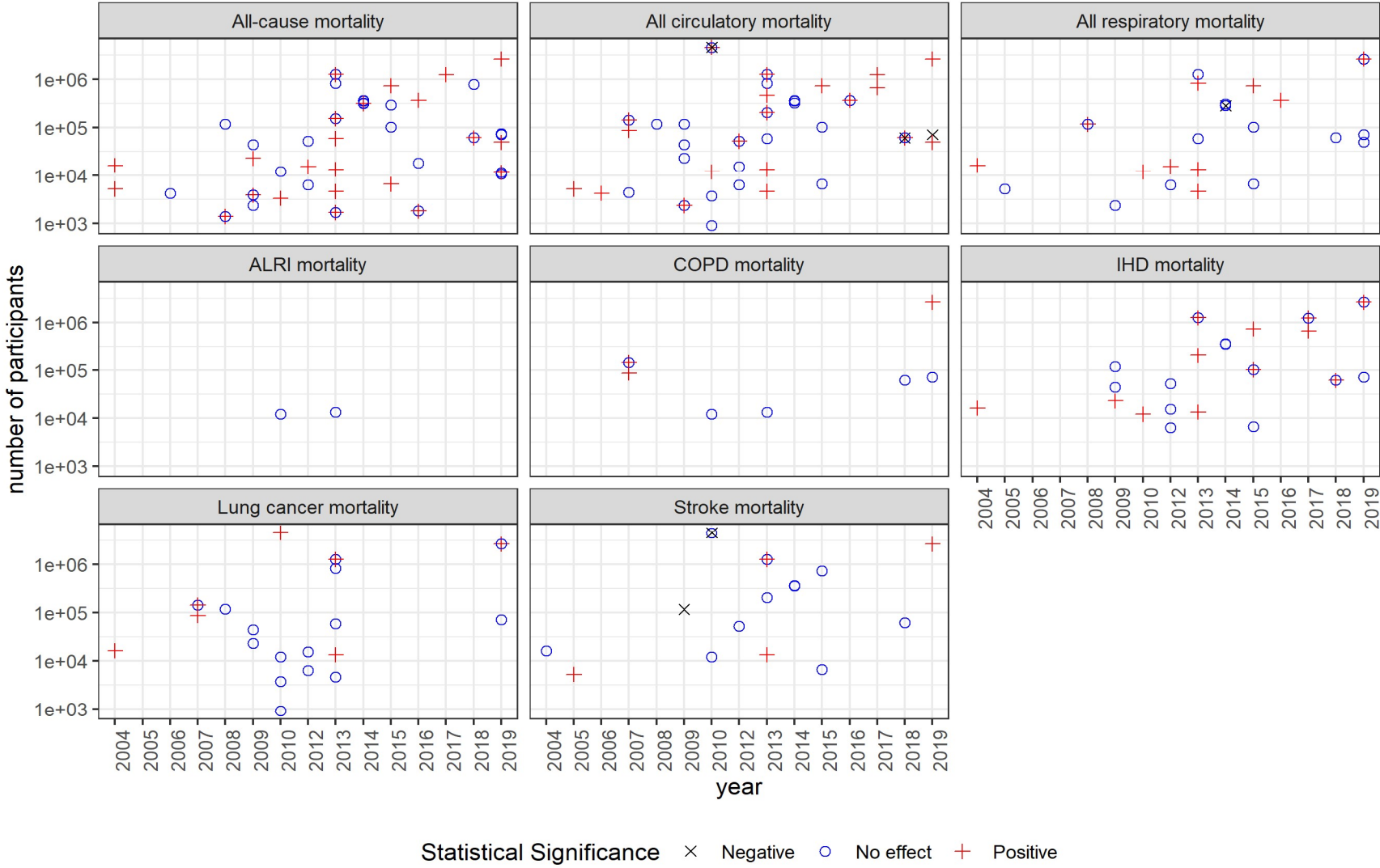
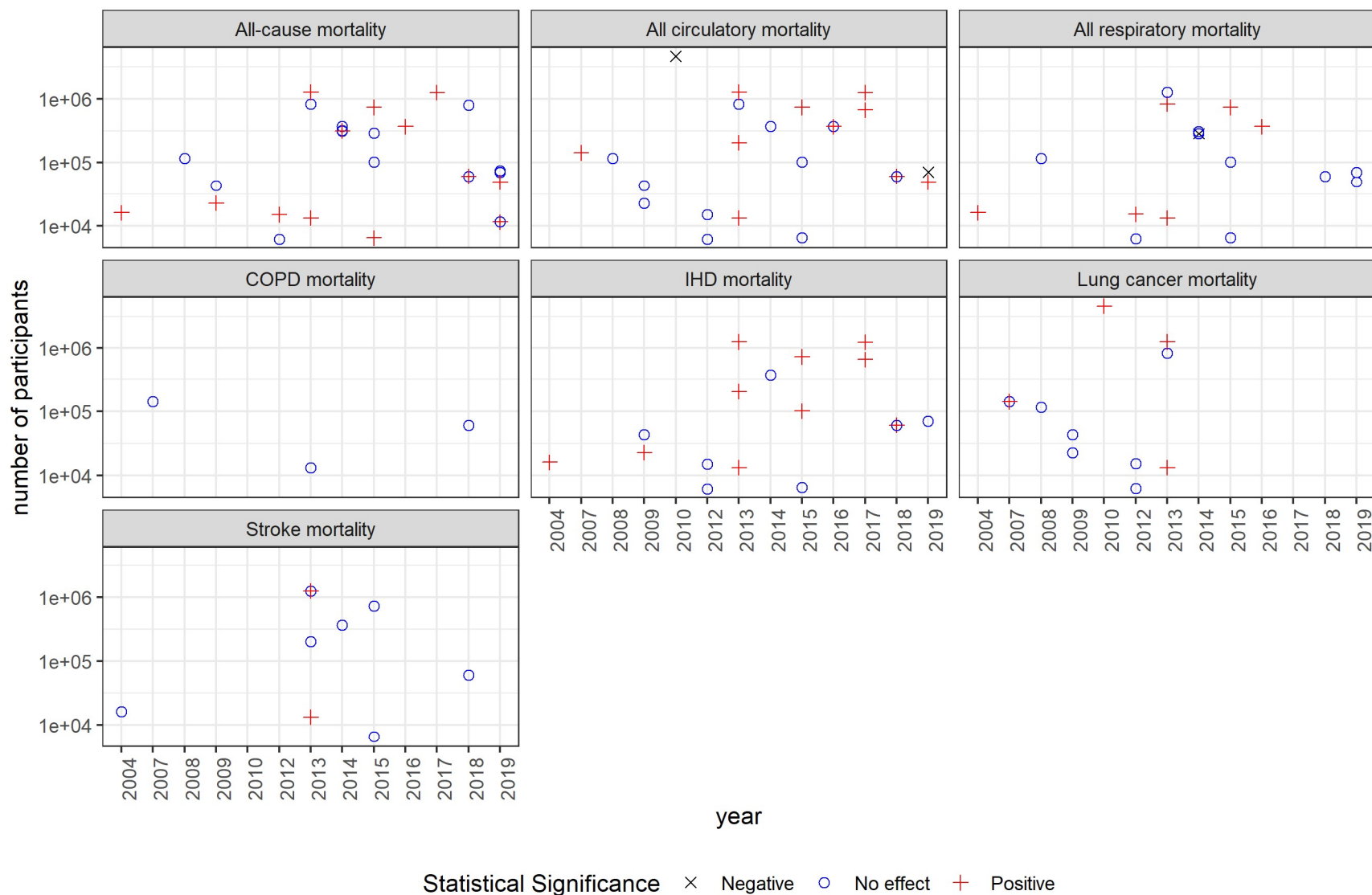
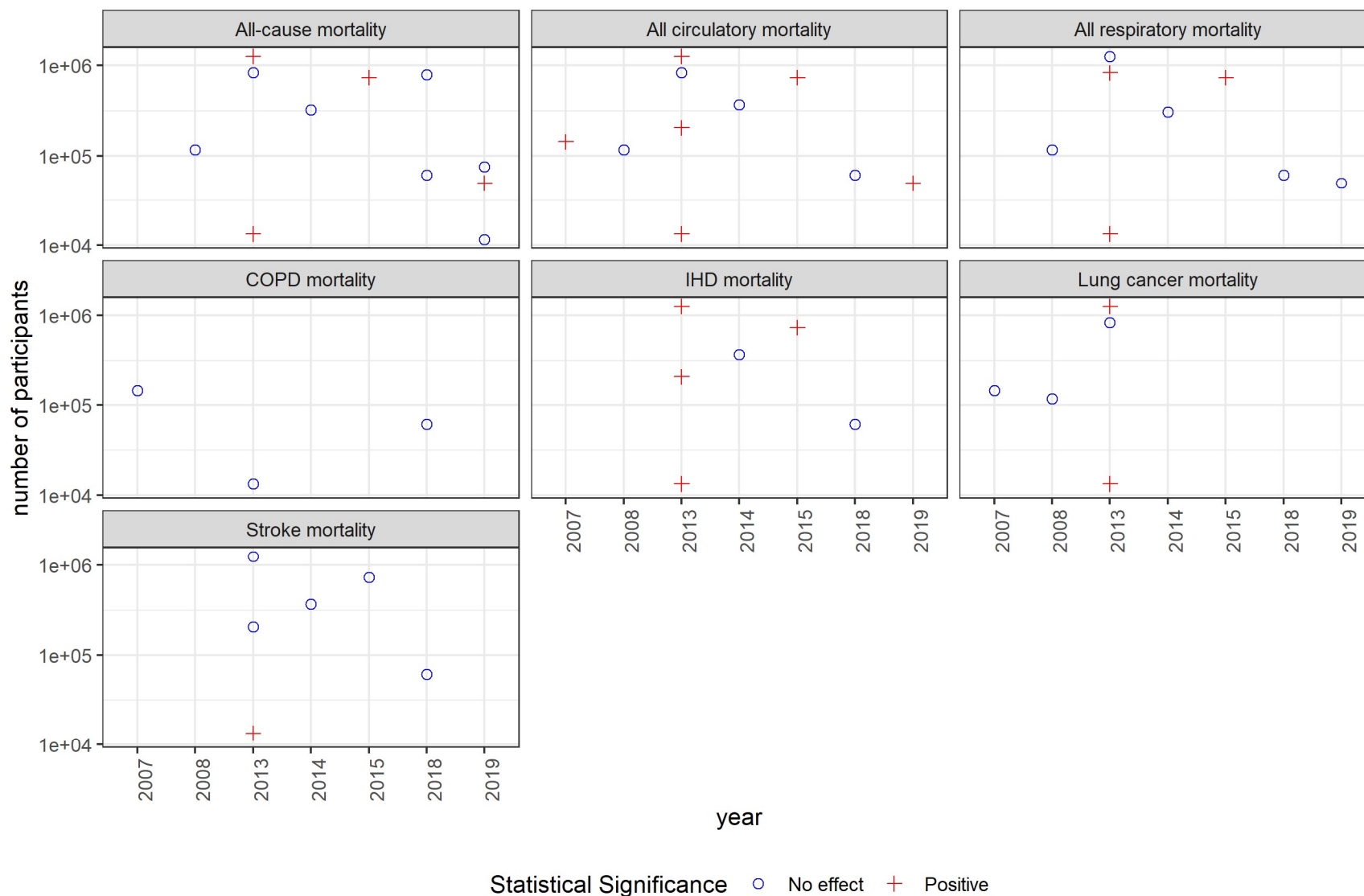


Figure 16. Statistical significance of results by number of participants and year for each mortality outcome included in the review. All studies included.



**Figure 17.** Statistical significance of results by number of participants and year for each **mortality outcome** included in the review. Only studies included in **meta-analysis** are included.



**Figure 18.** Statistical significance of results by number of participants and year for each **mortality outcome** included in the review. Only results for **NO<sub>2</sub>** associations included in **meta-analysis** are included.