



Supplementary materials

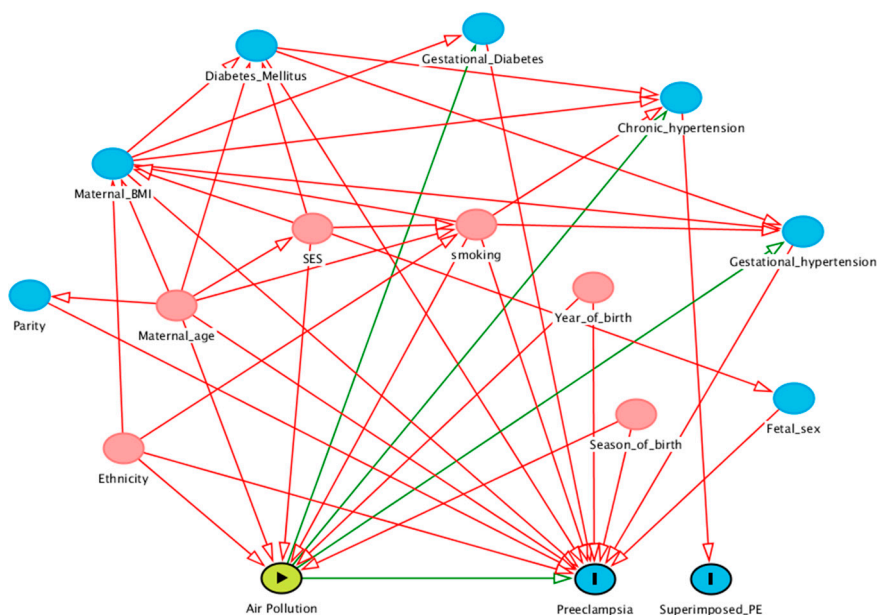


Figure S1. Directed Acyclic Graphs to guide the selection of potential confounders for the association between the ambient air pollution and preeclampsia: (yellow) exposure; (blue with I) outcome; (red dot) common cause; (blue dot) ancestor.

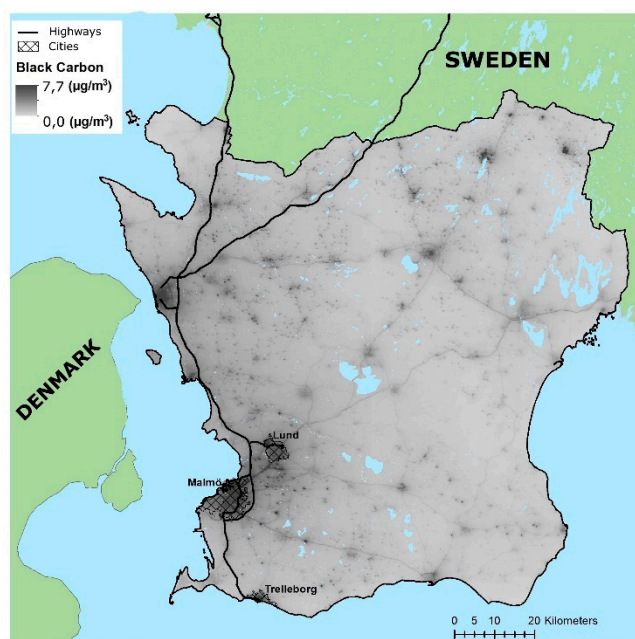


Figure S2. Local black carbon (BC) dispersion modeling in Scania, Sweden in January 2006. Map by Emilie Stroh.

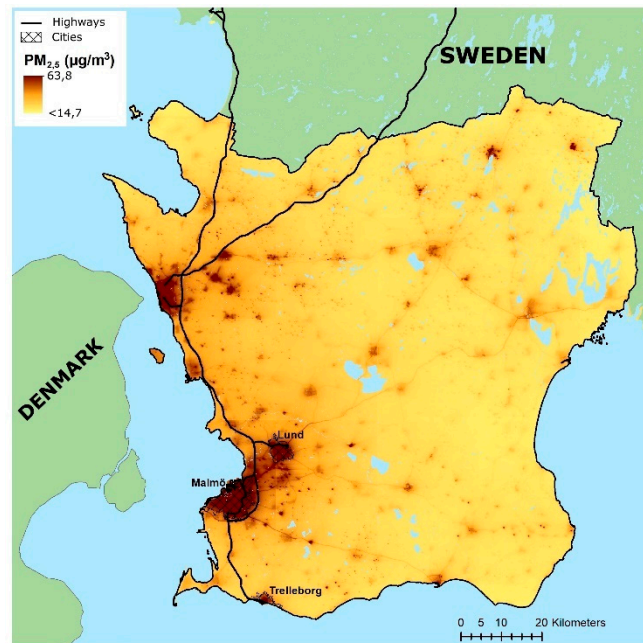


Figure S3. Local PM_{2.5} dispersion modeling in Scania, Sweden in January 2006. Map by Emilie Stroh.

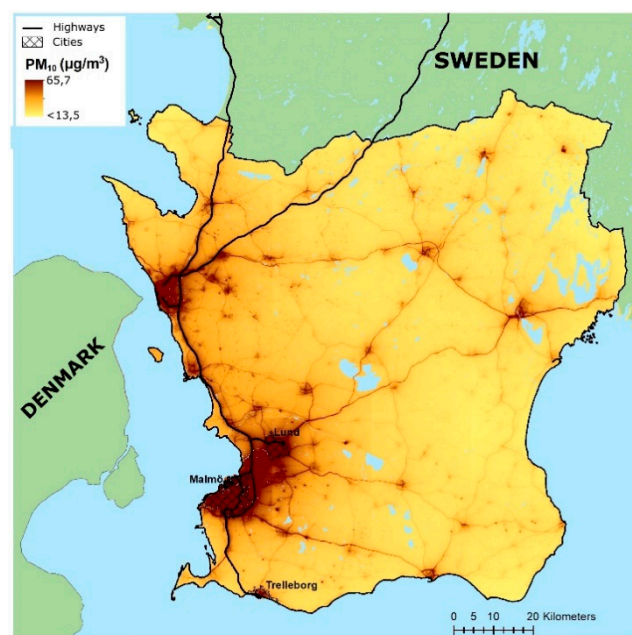


Figure S4. Local PM₁₀ dispersion modeling in Scania, Sweden in January 2006. Map by Emilie Stroh.

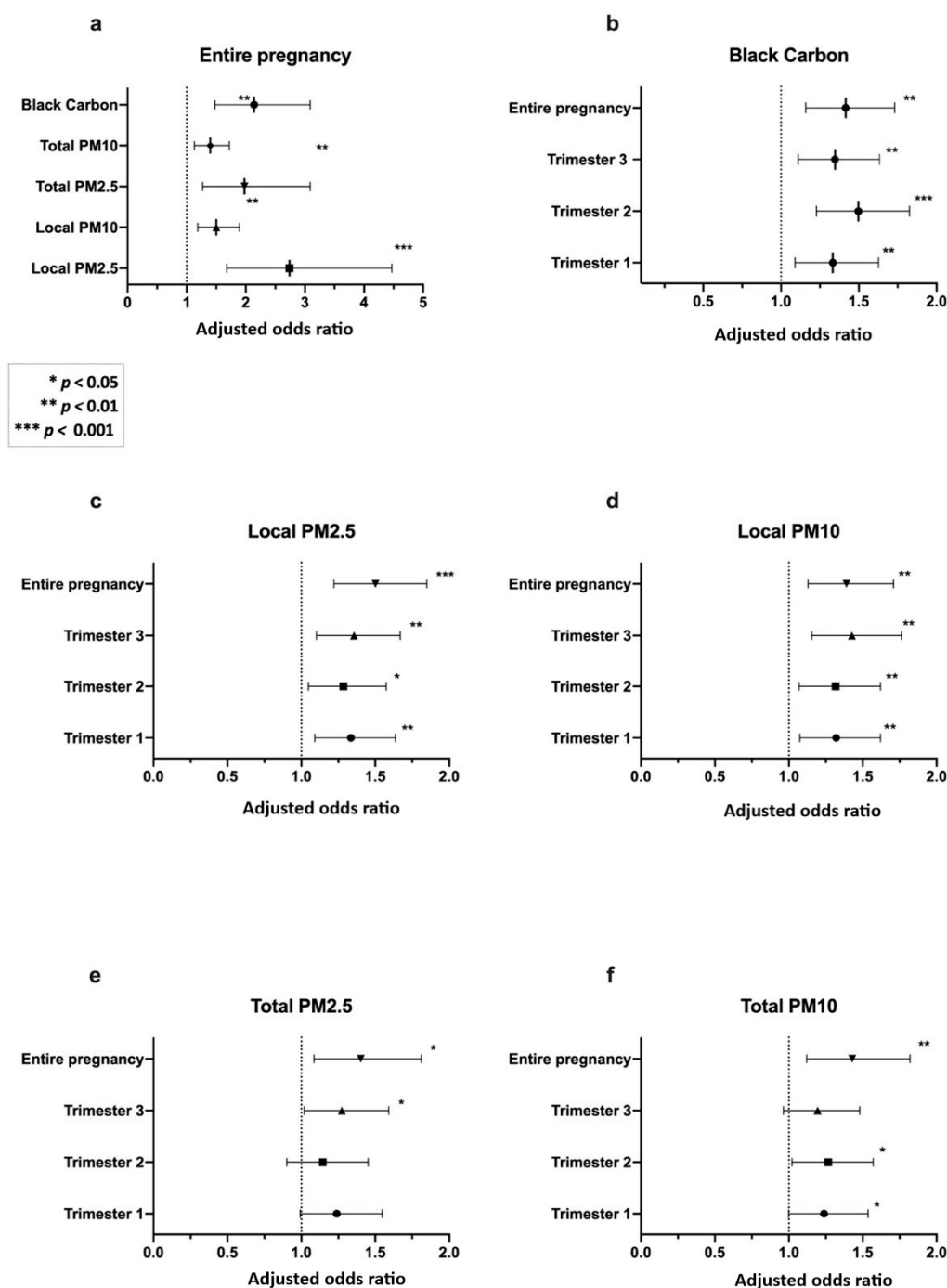


Figure S5. Graphic illustration of adjusted analysis of all particles. (a) Linear exposure trend in whole pregnancy. (b) Adjusted Odds Ratios (AORs) for PE at the highest quartiles of black carbon exposure in all exposure windows. (c) AORs for PE at the highest quartiles of local PM_{2.5} exposure in all exposure windows. (d) AORs for PE at the highest quartiles of local PM₁₀ exposure in all exposure windows. (e) AORs for PE at the highest quartiles of total PM_{2.5} exposure in all exposure windows. (f) AORs for PE at the highest quartiles of total PM₁₀ exposure in all exposure windows. p-values for (a) as compared to the healthy controls and for (b), (c), (d), (e) and (f) as compared to the lowest quartiles in each specific exposure windows.

Table S1. Pearson's correlations among pollutants ($\mu\text{g}/\text{m}^3$) in Scania, Sweden over the 2000–2009 period.

	NO _x	Local PM _{2.5}	Local PM ₁₀	BC	Total PM _{2.5}	Total PM ₁₀
Entire pregnancy						
NO _x	1.00					
Local PM _{2.5}	0.90**	1.00				
Local PM ₁₀	0.86**	0.96*	1.00			
BC	0.85**	0.87**	0.85**	1.00		
Total PM _{2.5}	0.58**	0.70**	0.69**	0.56**	1.00	
Total PM ₁₀	0.62**	0.63**	0.62**	0.55**	0.75**	1.00
First trimester						
NO _x	1.00					
Local PM _{2.5}	0.81**	1.00				
Local PM ₁₀	0.73**	0.94**	1.00			
BC	0.74**	0.77**	0.70**	1.00		
Total PM _{2.5}	0.37**	0.56**	0.56**	0.35**	1.00	
Total PM ₁₀	0.40**	0.42**	0.43**	0.37**	0.73**	1.00
Second trimester						
NO _x	1.00					
Local PM _{2.5}	0.82**	1.00				
Local PM ₁₀	0.72**	0.94**	1.00			
BC	0.81**	0.69**	0.61**	1.00		
Total PM _{2.5}	0.37**	0.60**	0.61**	0.26**	1.00	
Total PM ₁₀	0.41**	0.46**	0.45**	0.34**	0.74**	1.00
Third trimester						
NO _x	1.00					
Local PM _{2.5}	0.79**	1.00				
Local PM ₁₀	0.73**	0.94**	1.00			
BC	0.78**	0.72**	0.67**	1.00		
Total PM _{2.5}	0.37**	0.53**	0.55**	0.32**	1.00	
Total PM ₁₀	0.40**	0.42**	0.42**	0.38**	0.74**	1.00
** Correlation is significant at the 0.01 level (2-tailed).						

Table S2. Confounder characteristics among the second trimester-specific black carbon exposure quartiles ($n = 33,475$) over the 2000–2009 period.

Characteristics	First quartile <i>n</i> (%)	Second quartile <i>n</i> (%)	Third quartile <i>n</i> (%)	Fourth quartile <i>n</i> (%)
Births	8,303	8,666	7,983	8,523
Maternal age				
≤19	104 (1.3)	87 (1.0)	104 (1.3)	123 (1.4)
20–34	6,376 (76.8)	6,829 (78.8)	6,343 (79.5)	7,031 (82.5)
≥35	1,823 (22.0)	1,750 (20.2)	1,536 (19.2)	1,369 (16.1)
Parity				
Nulliparous	3,433 (41.3)	3,944 (45.5)	4,165 (52.2)	4,552 (53.4)
Parous	4,870 (58.7)	4,722 (54.5)	3,818 (47.8)	3,971 (46.6)

Pre-pregnancy BMI*				
<18.5	164 (2.0)	237 (2.7)	217 (2.7)	230 (2.7)
18.5-24.9	4,989 (60.1)	5,455 (62.9)	5,210 (65.3)	5,265 (68.1)
25-29.9	2,171 (26.1)	2,105 (24.3)	1,851 (23.2)	2,104 (24.7)
≥30	979 (11.8)	869 (10.0)	705 (8.8)	924 (10.8)
Smoking†				
Non-smoker	7,537 (90.8)	7,853 (90.6)	7,305 (91.5)	7,513 (88.1)
<10	548 (6.6)	610 (7.0)	481 (6.0)	687 (8.1)
≥10	218 (2.6)	203 (2.3)	197 (2.5)	323 (3.8)
Maternal health				
Diabetes Mellitus	58 (0.7)	44 (0.5)	62 (0.8)	64 (0.8)
Gestational diabetes	172 (2.1)	199 (2.3)	241 (3.0)	288 (3.4)
Essential hypertension	41 (0.5)	46 (0.5)	27 (0.3)	53 (0.6)
Gestational hypertension	183 (2.2)	146 (1.7)	118 (1.5)	106 (1.2)
Maternal education				
Pre-secondary	665 (8.0)	889 (10.3)	1,129 (14.1)	1,641 (19.3)
Secondary	4,129 (49.7)	3,706 (42.8)	3,024 (37.9)	3,704 (43.5)
Post-secondary	3,509 (42.3)	4,071 (47.0)	3,830 (48.0)	3,178 (37.3)
Household income‡				
<200,000	903 (10.9)	1,366 (15.8)	2,115 (26.5)	2,792 (32.8)
200,000-300,000	1,504 (18.1)	1,802 (20.8)	2,002 (25.1)	2,730 (32.0)
300,000-400,000	2,804 (33.8)	2,761 (31.9)	2,096 (26.3)	1,952 (22.9)
>400,000	3,092 (37.2)	2,737 (31.6)	1,770 (22.2)	1,049 (12.3)
Maternal country of birth				
Nordic	7,472 (90.0)	6,885 (79.4)	5,293 (66.3)	5,096 (59.8)
Other	831 (10.0)	1,781 (20.6)	2,690 (33.7)	3,427 (40.2)
Offspring sex				
Male	4,275 (51.5)	4,389 (50.6)	4,096 (51.3)	4,383 (51.4)
Female	4,028 (48.5)	4,277 (49.4)	3,887 (48.7)	4,140 (48.6)
Year of birth				
2000	277 (3.3)	323 (3.7)	302 (3.8)	455 (5.3)
2001	696 (8.4)	861 (9.9)	745 (9.3)	880 (10.3)
2002	728 (8.8)	846 (9.8)	816 (10.2)	1,066 (12.5)
2003	859 (10.3)	920 (10.6)	838 (10.5)	1,111 (13.0)
2004	758 (9.1)	929 (10.7)	821 (10.3)	1,328 (15.6)
2005	888 (10.7)	824 (9.5)	920 (11.5)	1,068 (12.5)
2006	806 (9.7)	808 (9.3)	934 (11.7)	997 (11.7)
2007	952 (11.5)	1,103 (12.7)	960 (12.0)	968 (11.4)
2008	1,518 (18.3)	1,311 (15.1)	882 (11.0)	231 (2.7)
2009	821 (9.9)	741 (8.6)	765 (9.6)	419 (4.9)
Season of birth				
Winter	1,794 (21.6)	1,927 (22.2)	1,600 (20.0)	2,223 (26.1)
Spring	1,952 (23.5)	2,198 (25.4)	1,852 (23.2)	2,561 (30.0)
Summer	2,258 (27.2)	2,251 (26.0)	2,244 (28.1)	2,187 (25.7)
Autumn	2,299 (27.7)	2,290 (26.4)	2,287 (28.6)	1,552 (18.2)
* Body Mass Index; † Cigarettes per day; ‡ Measured in Swedish kronor (SEK) per year.				

Table S3. Outcome events for total preeclampsia in relation to the lowest and highest exposure quartiles of all pollutants during each window of exposure.

Pollutant	Exposure window	Non-PE, n (%)	PE, n (%)	Total, n (%)	Lowest exposure quartile, n (%)	Highest exposure quartile, n (%)
Black carbon	Entire pregnancy	31,406 (97.1)	935 (2.9)	32,341 (90.9)	203 (21.7)	279 (29.8)**
	1 st trimester	32,574 (97.1)	970 (2.9)	33,544 (94.3)	219 (22.6)	283 (29.2)**
	2 nd trimester	32,499 (97.1)	976 (2.9)	33,475 (94.1)	211 (21.6)	302 (30.9)**
	3 rd trimester	32,624 (97.1)	982 (2.9)	33,606 (94.5)	223 (22.7)	304 (31.0)**

Local PM _{2.5}	Entire pregnancy	29,999 (97.1)	893 (2.9)	30,892 (86.8)	195 (21.8)	280 (31.4)**
	1 st trimester	32,124 (97.1)	962 (2.9)	33,086 (93.0)	232 (24.1)	268 (27.9) *
	2 nd trimester	31,601 (97.1)	946 (2.9)	32,547 (91.5)	222 (23.5)	285 (30.1)**
	3 rd trimester	32,594 (97.1)	979 (2.9)	33,573 (94.4)	206 (21.0)	283 (28.9)**
Local PM ₁₀	Entire pregnancy	30,125 (97.1)	908 (2.9)	31,033 (87.2)	203 (22.4)	276 (30.4)**
	1 st trimester	32,427 (97.1)	973 (2.9)	33,400 (93.9)	235 (24.2)	263 (27.0)
	2 nd trimester	31,656 (97.1)	954 (2.9)	32,610 (91.7)	218 (22.9)	284 (29.8)**
	3 rd trimester	32,268 (97.1)	972 (2.9)	33,240 (93.4)	201 (20.7)	293 (30.1)**
Total PM _{2.5}	Entire pregnancy	24,308 (97.0)	742 (3.0)	25,050 (70.4)	166 (22.4)	205 (27.6)
	1 st trimester	30,194 (97.1)	909 (2.9)	31,103 (87.4)	214 (23.5)	220 (24.2)
	2 nd trimester	27,624 (97.0)	844 (3.0)	28,468 (80.0)	185 (21.9)	216 (25.6)
	3 rd trimester	26,832 (97.0)	827 (3.0)	27,659 (77.8)	191 (23.1)	252 (30.5)**
Total PM ₁₀	Entire pregnancy	30,130 (97.1)	909 (2.9)	31,039 (87.3)	223 (24.5)	249 (27.4)
	1 st trimester	32,437 (97.1)	974 (2.9)	33,411 (93.9)	211 (21.7)	248 (25.5)*
	2 nd trimester	31,651 (97.1)	954 (2.9)	32,605 (91.7)	230 (24.1)	255 (26.7)
	3 rd trimester	32,268 (97.1)	972 (2.9)	33,240 (93.4)	239 (24.6)	263 (27.1)
NO _x	Entire pregnancy	32,323 (97.1)	974 (2.9)	33,297 (93.6)	211 (21.7)	271 (27.8)**
	1 st trimester	32,832 (97.1)	984 (2.9)	33,816 (95.1)	228 (23.2)	271 (27.5)**
	2 nd trimester	33,168 (97.1)	1,002 (2.9)	34,170 (96.1)	223 (22.3)	276 (27.5)**
	3 rd trimester	34,415 (97.1)	1,031 (2.9)	35,446 (99.7)	218 (21.1)	299 (29.0)**
*p <0.05 (compared with the lowest quartile). ** p <0.01 (compared with the lowest quartile).						

Table S4. Adjusted odds ratios (AOR) from the complete case analysis (CCA) on the effects of maternal exposure to ambient particles on risk for preeclampsia associated with a 1 µg/m³ increase in the concentration of BC and 5 µg/m³ increase in the concentration of local and total PM_{2.5} and PM₁₀ (with the intermediate variables^a derived from DAGs).

Exposure	Entire pregnancy AOR [§] (95% CI)	First trimester AOR [§] (95% CI)	Second trimester AOR [§] (95% CI)	Third trimester AOR [§] (95% CI)
Black carbon[†] (n/N)	935/32,341 2.14** (1.48, 3.09)	970/33,544 1.89** (1.34, 2.65)	976/33,475 2.08** (1.45, 2.98)	982/33,606 1.77** (1.28, 2.45)
Local PM_{2.5}[‡] (n/N)	893/30,892 2.74** (1.68, 4.47)	962/33,086 2.01** (1.34, 3.02)	946/32,547 2.11** (1.42, 3.13)	979/33,573 1.78** (1.22, 2.61)
Local PM₁₀[‡] (n/N)	908/31,033 1.50** (1.19, 1.89)	973/33,400 1.31** (1.09, 1.58)	954/32,610 1.32** (1.11, 1.58)	972/33,240 1.32** (1.11, 1.57)
Total PM_{2.5}[‡] (n/N)	742/25,050 1.98** (1.27, 3.09)	909/31,103 1.31* (1.06, 1.61)	844/28,468 1.14 (0.92, 1.42)	827/27,659 1.27* (1.03, 1.56)
Total PM₁₀[‡] (n/N)	909/31,039 1.40** (1.13, 1.72)	974/33,411 1.24** (1.09, 1.41)	954/32,605 1.10 (0.97, 1.26)	972/33,240 1.11 (0.98, 1.24)

^aIntermediate variables are gestational diabetes, essential hypertension, gestational hypertension.

[†]Estimates are for each 1 µg/m³ increase of black carbon particles. [‡]Estimates are for each 5 µg/m³ increase of local and total PM_{2.5} and PM₁₀. [§]Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, gestational diabetes, essential hypertension, gestational hypertension, maternal country of birth, education level, annual household income, fetal sex, year and season of

birth. *p-value <0.05 as compared to the healthy controls. **p-value <0.01 as compared to the healthy controls.

Table S5. Adjusted odds ratios (AOR) from the complete case analysis (CCA) on the effects of maternal exposure to ambient particles on risk for preeclampsia associated with a 1 µg/m³ increase in the concentration of BC and 5 µg/m³ increase in the concentration of local and total PM_{2.5} and PM₁₀ (without the intermediate variables^a derived from DAGs).

Exposure	Entire pregnancy AOR [§] (95% CI)	First trimester AOR [§] (95% CI)	Second trimester AOR [§] (95% CI)	Third trimester AOR [§] (95% CI)
Black carbon[†] (n/N)	935/32,341 2.00** (1.39, 2.88)	970/33,544 1.83** (1.31, 2.56)	976/33,475 1.97** (1.38, 2.81)	982/33,606 1.71** (1.24, 2.35)
Local PM_{2.5}[‡] (n/N)	893/30,892 2.74** (1.69, 4.44)	962/33,086 2.00** (1.34, 2.99)	946/32,547 2.09** (1.42, 3.08)	979/33,573 1.76** (1.21, 2.56)
Local PM₁₀[‡] (n/N)	908/31,033 1.48** (1.18, 1.87)	973/33,400 1.31* (1.09, 1.57)	954/32,610 1.31** (1.10, 1.56)	972/33,240 1.31** (1.10, 1.56)
Total PM_{2.5}[‡] (n/N)	742/25,050 2.09** (1.35, 3.24)	909/31,103 1.30* (1.06, 1.59)	844/28,468 1.16 (0.94, 1.43)	827/27,659 1.27* (1.04, 1.56)
Total PM₁₀[‡] (n/N)	909/31,039 1.40** (1.14, 1.72)	974/33,411 1.23** (1.08, 1.40)	954/32,605 1.11 (0.98, 1.26)	972/33,240 1.11 (0.98, 1.24)

^aIntermediate variables are gestational diabetes, essential hypertension, gestational hypertension.

[†]Estimates are for each 1 µg/m³ increase of black carbon particles. [‡]Estimates are for each 5 µg/m³ increase of local and total PM_{2.5} and PM₁₀. [§]Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, maternal country of birth, education level, annual household income, fetal sex, year and season of birth. *p-value <0.05 as compared to the healthy controls. **p-value <0.01 as compared to the healthy controls.

Table S6. Adjusted analysis for late-onset preeclampsia in relation to the quartile-specific exposure of all pollutants during each exposure window over the 2000-2009 period (n=43,688).

Pollutant	Exposure window	Non-PE, n	Late-onset PE, n	Quartile 2 AOR [§] (95% CI)	Quartile 3 AOR [§] (95% CI)	Quartile 4 AOR [§] (95% CI)
Black carbon	Entire pregnancy	38,124	1,129	1.07 (0.90, 1.28)	1.16 (0.97, 1.39)	1.22* (1.02, 1.46)
	1 st trimester	39,648	1,175	0.98 (0.82, 1.17)	1.13 (0.95, 1.35)	1.14 (0.95, 1.37)
	2 nd trimester	39,607	1,178	1.13 (0.95, 1.34)	1.11 (0.93, 1.34)	1.28** (1.07, 1.54)
	3 rd trimester	39,853	1,184	0.96 (0.81, 1.15)	1.06 (0.89, 1.27)	1.19* (1.00, 1.42)
Local PM_{2.5}	Entire pregnancy	36,430	1,076	1.05 (0.87, 1.26)	1.13 (0.94, 1.36)	1.31** (1.08, 1.58)
	1 st trimester	39,088	1,160	0.94 (0.79, 1.12)	1.09 (0.92, 1.30)	1.15 (0.96, 1.38)
	2 nd trimester	38,530	1,141	1.01 (0.85, 1.21)	0.98 (0.82, 1.18)	1.19 (0.99, 1.44)
	3 rd trimester	39,843	1,182	1.17 (0.98, 1.39)	1.19 (0.99, 1.42)	1.23* (1.02, 1.48)
Local PM₁₀	Entire pregnancy	36,736	1,095	1.00 (0.83, 1.19)	1.07 (0.89, 1.29)	1.18 (0.98, 1.42)
	1 st trimester	39,647	1,180	0.97 (0.82, 1.15)	1.06 (0.89, 1.26)	1.15 (0.96, 1.38)
	2 nd trimester	38,635	1,151	1.09 (0.92, 1.230)	1.00 (0.83, 1.20)	1.22* (1.01, 1.48)
	3 rd trimester	39,280	1,165	1.10 (0.92, 1.32)	1.12 (0.94, 1.34)	1.25* (1.03, 1.51)

Total PM_{2.5}	Entire pregnancy	29,633	904	1.06 (0.86, 1.31)	1.13 (0.92, 1.40)	1.26 (1.00, 1.59)
	1 st trimester	36,814	1,100	1.22* (1.02, 1.46)	1.11 (0.91, 1.34)	1.17 (0.96, 1.43)
	2 nd trimester	33,811	1,023	1.05 (0.86, 1.28)	1.11 (0.90, 1.37)	1.09 (0.88, 1.36)
	3 rd trimester	32,930	1,009	0.99 (0.82, 1.20)	0.94 (0.76, 1.14)	1.14 (0.93, 1.39)
Total PM₁₀	Entire pregnancy	36,744	1,097	0.98 (0.81, 1.18)	1.05 (0.86, 1.27)	1.28* (1.02, 1.59)
	1 st trimester	39,663	1,182	1.10 (0.92, 1.31)	1.17 (0.97, 1.40)	1.14 (0.94, 1.39)
	2 nd trimester	38,627	1,151	1.07 (0.90, 1.29)	1.04 (0.86, 1.25)	1.22* (1.00, 1.48)
	3 rd trimester	39,280	1,165	1.05 (0.88, 1.26)	1.02 (0.85, 1.23)	1.09 (0.89, 1.32)
NO_x	Entire pregnancy	39,484	1,174	1.16 (0.98, 1.38)	1.17 (0.98, 1.40)	1.38** (1.15, 1.65)
	1 st trimester	40,093	1,188	1.05 (0.89, 1.25)	1.15 (0.97, 1.37)	1.25* (1.05, 1.50)
	2 nd trimester	40,544	1,206	1.11 (0.93, 1.31)	1.18 (1.00, 1.41)	1.32** (1.10, 1.58)
	3 rd trimester	42,229	1,248	1.21* (1.02, 1.43)	1.12 (0.94, 1.33)	1.35** (1.13, 1.61)

§Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, gestational diabetes, essential hypertension, gestational hypertension, maternal country of birth, education level, annual household income, fetal sex, year and season of birth. *p-value <0.05. **p-value <0.01.

Table S7. The characteristics of the participants by the clinical subtypes of preeclampsia: early- and late-onset preeclampsia.

Characteristics	Total, N (%)	PE, n (%)	Early-onset PE, n (%)	Late-onset PE, n (%)
Births	43,688 (100)	1,286 (2.9)	31 (0.1)	1,255 (2.9)
Maternal age				
≤19	758 (1.7)	23 (1.8)	0 (0)	23 (1.8)
20-34	34,610 (79.2)	1,000 (77.8)	24 (77.4)	976 (77.8)
≥35	8,320 (19.0)	263 (20.5)	7 (22.6)	256 (20.4)
Parity				
Nulliparous	21,294 (48.7)	895 (69.6)	20 (64.5)	875 (69.7)
Parous	22,394 (51.3)	391 (30.4)	11 (35.5)	380 (30.3)
Pre-pregnancy BMI				
<18.5	1,017 (2.3)	16 (1.2)	1 (3.2)	15 (1.2)
18.5-24.9	24,097 (55.2)	515 (40.0)	9 (55.2)	506 (40.3)
25-29.9	9,377 (21.5)	325 (25.3)	6 (19.4)	319 (25.4)
≥30	3,996 (9.1)	246 (19.1)	1 (3.2)	245 (19.5)
Missing	5,201 (11.9)	184 (14.3)	14 (45.2)	170 (13.5)
Smoking (cigarettes/day)				
Non-smoker	36,662 (83.9)	1,097 (85.3)	16 (51.6)	1,081 (86.1)
<10	2,854 (6.5)	55 (4.3)	2 (6.5)	53 (4.2)
≥10	1,145 (2.6)	22 (1.7)	0 (0)	22 (1.8)
Missing	3,027 (6.9)	112 (8.7)	13 (41.9)	99 (7.9)
Maternal health				
Diabetes Mellitus	298 (0.7)	27 (2.1)	2 (6.5)	25 (2.0)
Gestational Diabetes	1,203 (2.8)	76 (5.9)	5 (16.1)	71 (5.7)
Essential hypertension	204 (0.5)	38 (3.0)	1 (3.2)	37 (2.9)

Gestational hypertension	703 (1.6)	149 (11.6)	2 (6.5)	147 (11.7)
Maternal education				
Pre-secondary	5,369 (12.3)	139 (10.8)	4 (12.9)	135 (10.8)
Secondary	18,080 (41.4)	596 (46.3)	17 (54.8)	579 (46.1)
Post-secondary	18,451 (42.2)	517 (40.2)	10 (32.3)	507 (40.4)
Missing	1,788 (4.1)	34 (2.6)	0 (0)	34 (2.7)
Household income (SEK/year)				
<200,000	9,846 (22.5)	285 (22.2)	9 (29.0)	276 (22.0)
200,000–300,000	10,559 (24.2)	349 (27.1)	9 (29.0)	340 (27.1)
300,000–400,000	11,699 (26.8)	349 (27.1)	10 (32.3)	339 (27.0)
>400,000	10,540 (24.1)	274 (21.3)	3 (9.7)	271 (21.6)
Missing	1,044 (2.4)	29 (2.3)	0 (0)	29 (2.3)
Maternal country of birth				
Nordic country	31,172 (71.4)	985 (76.8)	23 (74.2)	962 (76.9)
Other country	12,457 (28.6)	297 (23.2)	8 (25.8)	289 (23.1)
Fetal sex				
Male	22,515 (51.5)	682 (53.0)	22 (71.0)	660 (52.6)
Female	21,173 (48.5)	604 (47.0)	9 (29.0)	595 (47.4)
Year of birth				
2000	3,820 (8.7)	98 (7.6)	8 (25.8)	90 (7.2)
2001	4,003 (9.2)	110 (8.6)	4 (12.9)	106 (8.4)
2002	4,486 (10.3)	129 (10.0)	6 (19.4)	123 (9.8)
2003	4,507 (10.3)	104 (8.1)	5 (16.1)	99 (7.9)
2004	4,578 (10.5)	120 (9.3)	5 (16.1)	115 (9.2)
2005	4,767 (10.9)	156 (12.1)	3 (9.7)	153 (12.2)
2006	4,188 (9.6)	169 (13.1)	0 (0)	169 (13.5)
2007	4,685 (10.7)	147 (11.4)	0 (0)	147 (11.7)
2008	4,723 (10.8)	140 (10.9)	0 (0)	140 (11.2)
2009	3,931 (9.0)	113 (8.8)	0 (0)	113 (9.0)
Season of birth				
Winter	10,298 (23.6)	306 (23.8)	4 (12.9)	302 (24.1)
Spring	11,245 (25.7)	363 (28.2)	8 (25.8)	355 (28.3)
Summer	11,121 (25.5)	281 (21.9)	11 (35.5)	270 (21.5)
Autumn	11,024 (25.2)	336 (26.1)	8 (25.8)	328 (26.1)

Table S8. Adjusted analysis for PE with SGA vs. PE without SGA in relation to the exposure quartiles of black carbon particles ($\mu\text{g}/\text{m}^3$) during each window of exposure.

Black carbon Adjusted OR ^s (95% CI)		
Range, $\mu\text{g}/\text{m}^3$	PE with SGA	PE without SGA
Entire pregnancy	201/31607	734/29073
Linear (1 $\mu\text{g}/\text{m}^3$)	3.48 (1.67, 7.27)**	1.89 (1.24, 2.88)**
Q1 (0.03 – 0.21 $\mu\text{g}/\text{m}^3$)	Reference	Reference
Q2 (0.21 – 0.36 $\mu\text{g}/\text{m}^3$)	1.27 (0.82, 1.98)	1.16 (0.93, 1.45)
Q3 (0.36 – 0.48 $\mu\text{g}/\text{m}^3$)	1.26 (0.80, 1.97)	1.38 (1.10, 1.72)**
Q4 (0.48 – 1.93 $\mu\text{g}/\text{m}^3$)	1.74 (1.13, 2.67)*	1.36 (1.08, 1.70)**
First trimester	209/32783	761/30148
Linear (1 $\mu\text{g}/\text{m}^3$)	2.94 (1.53, 5.63)**	1.67 (1.13, 2.46)*
Q1 (0.03 – 0.23 $\mu\text{g}/\text{m}^3$)	Reference	Reference
Q2 (0.23 – 0.37 $\mu\text{g}/\text{m}^3$)	1.09 (0.71, 1.68)	1.04 (0.83, 1.31)
Q3 (0.37 – 0.49 $\mu\text{g}/\text{m}^3$)	1.23 (0.81, 1.86)	1.34 (1.08, 1.67)**
Q4 (0.49 – 2.94 $\mu\text{g}/\text{m}^3$)	1.52 (1.00, 2.32)	1.31 (1.04, 1.64)*
Second trimester	206/32705	770/30083
Linear (1 $\mu\text{g}/\text{m}^3$)	3.20 (1.59, 6.42)**	1.87 (1.24, 2.81)**
Q1 (0.02 – 0.18 $\mu\text{g}/\text{m}^3$)	Reference	Reference

Q2 (0.18 – 0.30 µg/m ³)	1.43 (0.93, 2.21)	1.16 (0.93, 1.43)
Q3 (0.30 – 0.42 µg/m ³)	1.34 (0.85, 2.10)	1.17 (0.93, 1.46)
Q4 (0.42 – 2.01 µg/m ³)	1.82 (1.18, 2.83)**	1.45 (1.17, 1.82)**
Third trimester	207/32831	775/30185
Linear (1 µg/m ³)	2.60 (1.33, 5.07)**	1.64 (1.13, 2.37)**
Q1 (0.03 – 0.21 µg/m ³)	Reference	Reference
Q2 (0.21 – 0.37 µg/m ³)	1.20 (0.77, 1.85)	1.05 (0.84, 1.30)
Q3 (0.37 – 0.52 µg/m ³)	1.41 (0.91, 2.18)	1.19 (0.95, 1.49)
Q4 (0.52 – 2.31 µg/m ³)	1.71 (1.12, 2.60)*	1.28 (1.03, 1.59)*

§Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, gestational diabetes, essential hypertension, gestational hypertension, maternal country of birth, education level, annual household income, fetal sex, year and season of birth. *p-value <0.05 as compared to the healthy controls. **p-value <0.01 as compared to the healthy controls.

Table S9. Adjusted analyses for PE with SGA vs. PE without SGA in relation to the exposure quartiles of local and total PM_{2.5} (µg/m³) during each window of exposure.

Local PM _{2.5}			Total PM _{2.5}		
Adjusted OR [§] (95% CI)			Adjusted OR [§] (95% CI)		
Range, µg/m ³	PE with SGA	PE without SGA	Range, µg/m ³	PE with SGA	PE without SGA
Entire pregnancy	193/30,192	700/27,747		154/24,462	588/22,462
Linear (5 µg/m ³)	4.33 (1.56, 12.04)**	2.56 (1.48, 4.43)**		1.49 (0.56, 3.94)	2.20 (1.34, 3.61)**
Q1 (0.13 – 0.96)	Reference	Reference	Q1 (6.85 – 10.34)	Reference	Reference
Q2 (0.96 – 1.50)	1.09 (0.69, 1.73)	1.18 (0.94, 1.49)	Q2 (10.34 – 11.02)	0.98 (0.60, 1.60)	1.07 (0.82, 1.39)
Q3 (1.50 – 2.08)	1.42 (0.92, 2.21)	1.24 (0.98, 1.57)	Q3 (11.02 – 11.76)	1.06 (0.65, 1.73)	1.32 (1.02, 1.72)*
Q4 (2.08 – 7.52)	1.65 (1.06, 2.58)*	1.50 (1.19, 1.90)**	Q4 (11.76 – 17.30)	1.05 (0.60, 1.83)	1.54 (1.15, 2.05)**
First trimester	208/32,332	754/29,726		196/30,390	713/27,934
Linear (5 µg/m ³)	2.57 (1.13, 5.82)*	1.96 (1.24, 3.10)**		1.45 (0.95, 2.23)	1.30 (1.03, 1.65)*
Q1 (0.09 – 0.89)	Reference	Reference	Q1 (6.19 – 9.64)	Reference	Reference
Q2 (0.89 – 1.42)	1.19 (0.77, 1.83)	1.01 (0.81, 1.25)	Q2 (9.64 – 10.94)	1.51 (0.96, 2.37)	1.18 (0.95, 1.47)
Q3 (1.42 – 2.11)	1.36 (0.89, 2.09)	1.21 (0.97, 1.50)	Q3 (10.94 – 12.12)	1.72 (1.09, 2.71)*	1.07 (0.84, 1.36)
Q4 (2.11 – 10.68)	1.59 (1.03, 2.45)*	1.32 (1.05, 1.65)*	Q4 (12.12 – 22.06)	1.51 (0.92, 2.48)	1.22 (0.95, 1.56)
Second trimester	199/31,800	747/29,230		174/27,798	670/25,546
Linear (5 µg/m ³)	2.87 (1.26, 6.55)*	2.00 (1.28, 3.11)**		1.36 (0.86, 2.15)	1.10 (0.86, 1.40)
Q1 (0.08 – 0.88)	Reference	Reference	Q1 (6.23 – 9.63)	Reference	Reference
Q2 (0.88 – 1.40)	0.77 (0.49, 1.21)	1.03 (0.82, 1.28)	Q2 (9.63 – 10.89)	1.23 (0.75, 2.02)	1.01 (0.79, 1.30)
Q3 (1.40 – 2.09)	1.20 (0.80, 1.81)	1.02 (0.82, 1.28)	Q3 (10.89 – 12.11)	1.19 (0.71, 2.01)	1.09 (0.84, 1.41)
Q4 (2.09 – 10.5)	1.29 (0.84, 1.99)	1.31 (1.04, 1.65)*	Q4 (12.11 – 21.31)	1.37 (0.81, 2.32)	1.09 (0.83, 1.42)
Third trimester	206/32,800	773/30,149		167/26,999	660/24,799
Linear (5 µg/m ³)	2.65 (1.19, 5.92)*	1.65 (1.07, 2.53)*		0.92 (0.58, 1.44)	1.37 (1.09, 1.72)**
Q1 (0.10 – 0.83)	Reference	Reference	Q1 (5.44 – 9.72)	Reference	Reference
Q2 (0.83 – 1.35)	1.71 (1.10, 2.65)*	1.20 (0.97, 1.49)	Q2 (9.72 – 10.94)	1.13 (0.73, 1.77)	1.00 (0.78, 1.28)
Q3 (1.35 – 2.05)	1.72 (1.10, 2.68)**	1.26 (1.01, 1.57)*	Q3 (10.94 – 12.18)	0.92 (0.57, 1.48)	1.07 (0.83, 1.38)
Q4 (2.05 – 9.64)	1.92 (1.21, 3.05)**	1.25 (0.99, 1.58)	Q4 (12.18 – 25.75)	0.83 (0.51, 1.38)	1.40 (1.09, 1.80)**

§Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, gestational diabetes, essential hypertension, gestational hypertension, maternal country of birth, education level, annual household income, fetal sex, year and season of birth. *p-value <0.05 as compared to the healthy controls. **p-value <0.01 as compared to the healthy controls.**Table S10.** Adjusted analyses for PE with SGA vs. PE without SGA in relation to the exposure quartiles of local and total PM₁₀ (µg/m³) during each window of exposure.

Local PM ₁₀			Total PM ₁₀		
Adjusted OR [§] (95% CI)			Adjusted OR [§] (95% CI)		
Range, µg/m ³	PE with SGA	PE without SGA	Range, µg/m ³	PE with SGA	PE without SGA
Entire pregnancy	198/30,323	710/27,896		198/30,328	711/27,902
Linear (5 µg/m ³)	1.73 (1.06, 2.82)*	1.48 (1.14, 1.92)**		1.77 (1.14, 2.75)*	1.34 (1.06, 1.69)*

Q1 (0.20 – 1.60)	Reference	Reference	Q1 (10.25 – 14.12)	Reference	Reference
Q2 (1.60 – 2.76)	1.01 (0.65, 1.58)	1.14 (0.91, 1.43)	Q2 (14.12 – 15.64)	2.33 (1.47, 3.69)**	0.84 (0.66, 1.06)
Q3 (2.76– 4.03)	1.22 (0.80, 1.88)	1.24 (0.98, 1.56)	Q3 (15.64 – 17.27)	2.25 (1.38, 3.67)**	1.00 (0.79, 1.27)
Q4 (4.03 – 9.97)	1.48 (0.96, 2.27)	1.39 (1.10, 1.76)**	Q4 (17.27 – 25.62)	2.27 (1.29, 3.98)**	1.33 (1.01, 1.73)*
First trimester	208/32,635	765/30,011		208/32,645	766/30,021
Linear (5 µg/m ³)	1.46 (1.01, 2.12)*	1.30 (1.06, 1.60)*		1.40 (1.08, 1.82)*	1.19 (1.03, 1.38)*
Q1 (0.12 – 1.42)	Reference	Reference	Q1 (8.58 – 13.70)	Reference	Reference
Q2 (1.42 – 2.44)	0.95 (0.62, 1.47)	1.03 (0.83, 1.28)	Q2 (13.70 – 15.61)	1.30 (0.84, 2.03)	1.21 (0.97, 1.50)
Q3 (2.44 – 4.13)	1.31 (0.86, 1.98)	1.18 (0.95, 1.46)	Q3 (15.61 – 17.54)	1.94 (1.27, 2.97)**	1.22 (0.97, 1.53)
Q4 (4.13 – 13.74)	1.44 (0.93, 2.22)	1.32 (1.04, 1.66)*	Q4 (17.54 – 36.24)	1.45 (0.90, 2.33)	1.20 (0.94, 1.53)
Second trimester	204/31,860	750/29,299		204/31,855	750/29,295
Linear (5 µg/m ³)	1.41 (0.97, 2.06)	1.32 (1.08, 1.61)**		1.19 (0.91, 1.56)	1.09 (0.94, 1.26)
Q1 (0.12 – 1.41)	Reference	Reference	Q1 (8.7 – 13.68)	Reference	Reference
Q2 (1.41 – 2.37)	0.98 (0.64, 1.49)	1.07 (0.86, 1.34)	Q2 (13.68 – 15.51)	1.01 (0.64, 1.58)	1.15 (0.92, 1.43)
Q3 (2.37 – 4.11)	1.14 (0.75, 1.74)	1.07 (0.85, 1.34)	Q3 (15.51 – 17.61))	1.33 (0.86, 2.05)	1.15 (0.91, 1.44)
Q4 (4.11 – 14.17)	1.29 (0.83, 2.01)	1.34 (1.06, 1.69)*	Q4 (17.61 – 36.19)	1.61 (1.02, 2.55)*	1.22 (0.95, 1.55)
Third trimester	206/32,474	766/29,862		206/32,474	766/29,862
Linear (5 µg/m ³)	1.44 (0.99, 2.11)	1.30 (1.07, 1.58)**		1.09 (0.85, 1.40)	1.12 (0.98, 1.28)
Q1 (0.10 – 1.28)	Reference	Reference	Q1 (6.58 – 13.29)	Reference	Reference
Q2 (1.28 – 2.26)	1.93 (1.24, 2.99)**	1.09 (0.87, 1.36)	Q2 (13.29 – 15.38)	1.11 (0.72, 1.69)	1.01 (0.81, 1.26)
Q3 (2.26 – 3.94)	1.62 (1.02, 2.57)*	1.18 (0.95, 1.48)	Q3 (15.38 – 17.51)	1.35 (0.88, 2.06)	1.01 (0.80, 1.27)
Q4 (3.94 – 13.19)	2.20 (1.37, 3.54)**	1.30 (1.02, 1.64)*	Q4 (17.51 – 38.36)	1.03 (0.64, 1.66)	1.26 (0.99, 1.60)

§Adjusted for maternal age, body mass index, parity, smoking, diabetes mellitus, gestational diabetes, essential hypertension, gestational hypertension, maternal country of birth, education level, annual household income, fetal sex, year and season of birth. *p-value <0.05 as compared to the healthy controls. **p-value <0.01 as compared to the healthy controls.