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# Exposure to air pollution from traffic and neurodevelopmental disorders in Swedish twins

Gong, Tong; Almqvist, Catarina; Bölte, Sven; Lichtenstein, Paul; Anckarsäter, Henrik; Lind, Tomas; Lundholm, Cecilia; Pershagen, Göran

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## **Supplemental Materials regarding to the article submitted to Twin Research and Human Genetics**

### **Exposure to air pollution from traffic and neurodevelopmental disorders in Swedish Twins**

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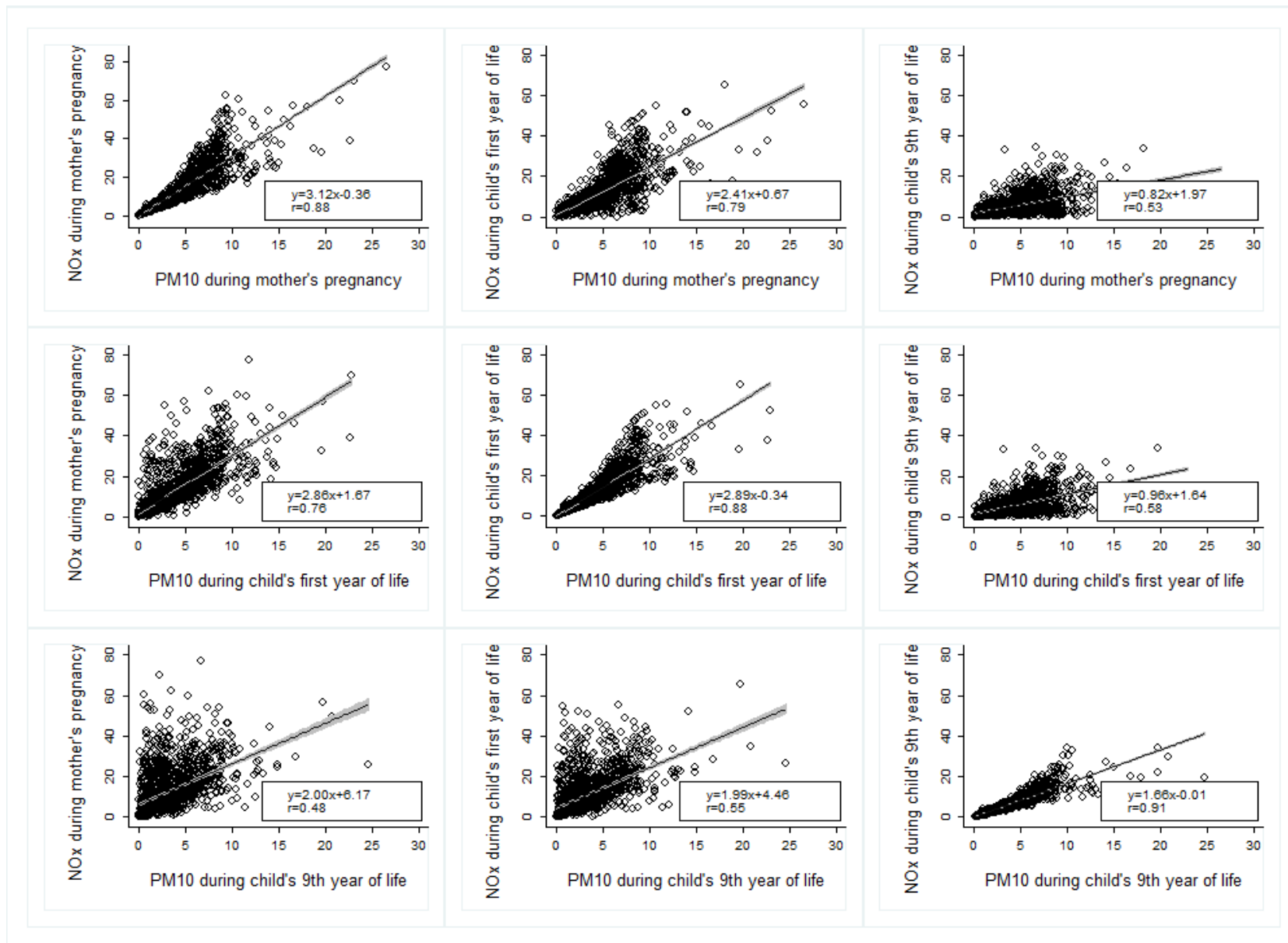


Figure S1b. Correlation of each pollutant ( $\text{NO}_x$  and  $\text{PM}_{10}$  in  $\mu\text{g}/\text{m}^3$ ) over different study periods (n=3,408 for child's first year of life; n=3,041 for child's 9<sup>th</sup> year of life of life)

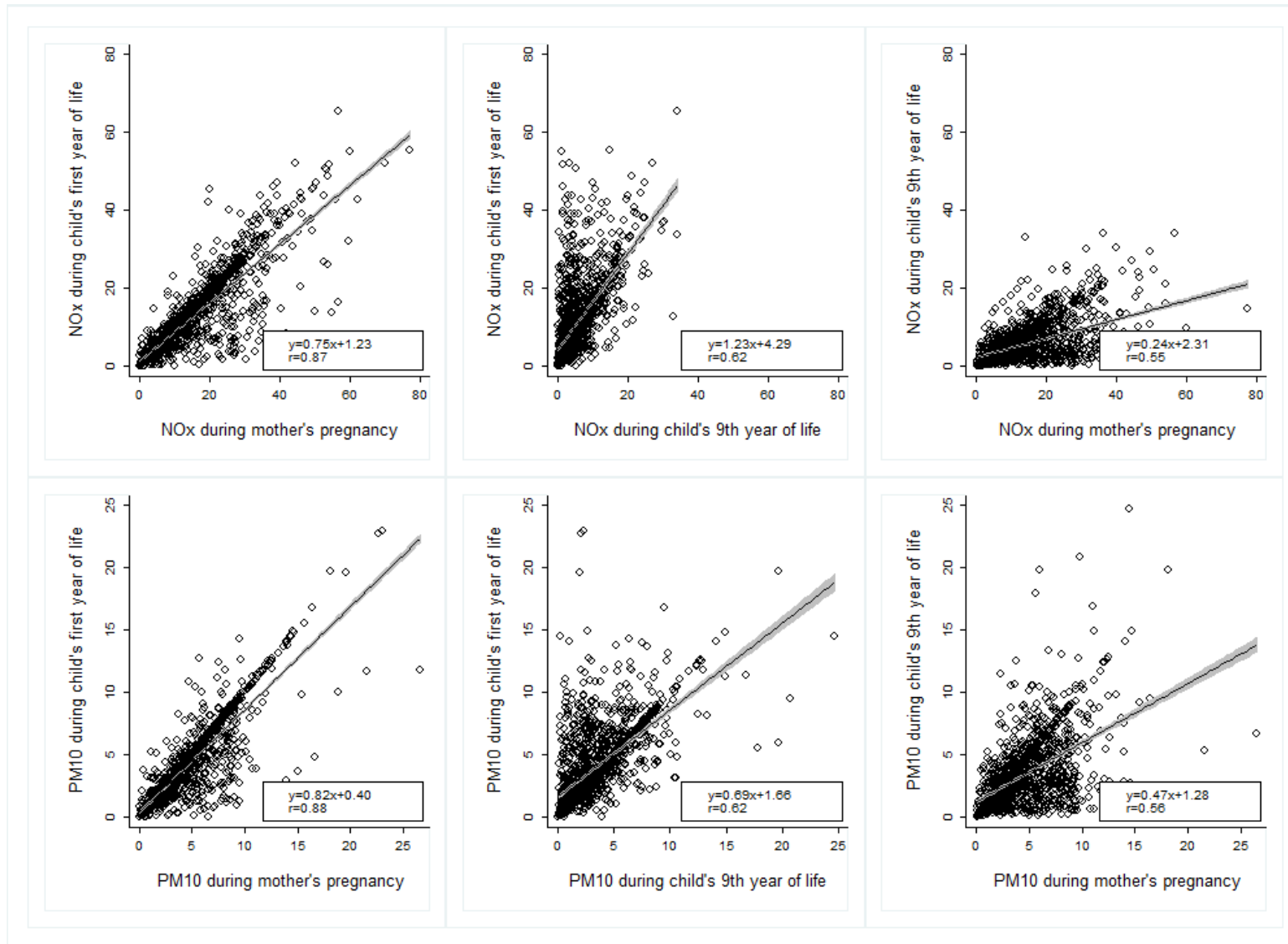


Table S1. Codes based on the 9<sup>th</sup> and 10<sup>th</sup> edition of International Classification of Diseases (ICD-9 and ICD-10) used to identify cases with chromosome abnormalities, neural tube defects and other neurological diseases from the National Patient Register and the telephone interview.

Diseases	ICD-9 codes	ICD-10 codes	N
Down's syndrome	758A	Q90	4
Fragile X syndrome	759.8 or 759W	Q99.2	0
Other chromosome aberrations	758B,C,D,E,F,G,H,W, X	Q91-Q92	0
Epilepsy	345	G40-G41	25
Spina bifida and other congenital anomalies of nervous system	741,742	Q01-Q07	4
Mental retardation	317, 318, 319	F70-F79, F88-F89	74
Cerebral palsy and plegias	342, 343, 344	G80, G81-G83	24
Other neurological disorders	330, 333-337, 348-349, 434, 436- 437	G90-G99	9

Table S2. Distribution of NO<sub>x</sub> and PM<sub>10</sub> exposure levels for different trimesters during pregnancy

	10 <sup>th</sup> percentile	25 <sup>th</sup> percentile	Mean	Median	75 <sup>th</sup> percentile	90 <sup>th</sup> percentile	Missing (n)
<b>First trimester</b>							
<b>NO<sub>x</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	2.53	4.94	13.27	9.25	18.78	29.76	105
Dispersion model with seasonal variation but no imputation	2.50	4.61	12.33	8.59	17.62	27.83	1,035
Dispersion model with seasonal variation and imputation	2.62	5.02	13.26	9.33	18.61	30.21	105
<b>PM<sub>10</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	0.95	1.94	4.28	3.42	6.15	8.50	105
Dispersion model with seasonal variation but no imputation	0.19	1.62	4.29	3.62	6.48	9.18	1,196
Dispersion model with seasonal variation and imputation	0.18	1.58	4.32	3.78	6.62	9.18	1,001
<b>Second trimester</b>							
<b>NO<sub>x</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	2.49	4.74	12.76	9.00	18.01	28.42	80
Dispersion model with seasonal variation but no imputation	2.20	4.46	11.95	8.65	16.81	26.86	865
Dispersion model with seasonal variation and imputation	2.31	4.72	12.73	8.99	17.68	28.38	80
<b>PM<sub>10</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	0.95	1.90	4.22	3.36	5.98	8.45	80
Dispersion model with seasonal variation but no imputation	0.28	1.75	4.22	3.66	6.24	8.81	994

Dispersion model with seasonal variation and imputation	0.48	1.73	4.26	3.68	6.23	8.80	834
<b>Third trimester</b>							
<b>NO<sub>x</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	2.42	4.67	12.03	8.38	16.37	26.95	100
Dispersion model with seasonal variation but no imputation	2.06	4.24	11.37	8.06	15.57	25.18	812
Dispersion model with seasonal variation and imputation	2.11	4.59	12.03	8.60	16.55	26.73	100
<b>PM<sub>10</sub> exposure (µg/m<sup>3</sup>)</b>							
Dispersion model	0.92	1.86	4.09	3.24	5.80	8.32	100
Dispersion model with seasonal variation but no imputation	-0.19	1.54	4.14	3.67	6.27	8.91	1,000
Dispersion model with seasonal variation and imputation	0.03	1.57	4.19	3.69	6.29	8.87	794



Table S3a. Crude and adjusted ORs of neurodevelopmental disorders for twins born in Stockholm, by exposure to NO<sub>x</sub> in each trimester

Outcomes	Case	NO <sub>x</sub> during 1 <sup>st</sup> trimester		NO <sub>x</sub> during 2 <sup>nd</sup> trimester		NO <sub>x</sub> during 3 <sup>rd</sup> trimester	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>							
ASD <sub>low</sub>	109	0.96 (0.48,1.95)	0.96 (0.47,1.99)	0.91 (0.43,1.95)	0.88 (0.40,1.93)	0.90 (0.41,1.99)	0.99 (0.46,2.14)
ASD <sub>high</sub>	33	0.58 (0.21, 1.62)	0.72 (0.25, 2.10)	0.33 (0.10, 1.02)	0.43 (0.13, 1.41)	0.37 (0.12, 1.13)	0.47 (0.13, 1.74)
ASD <sub>DSM-IV</sub>	47	0.78 (0.30,2.06)	0.85 (0.33,2.22)	0.58 (0.19,1.75)	0.61 (0.20,1.83)	0.67 (0.22,2.05)	0.74 (0.23,2.38)
<b>ADHD</b>							
ADHD <sub>low</sub>	328	0.70 (0.46,1.06)	0.84 (0.54,1.29)	0.76 (0.49,1.18)	0.89 (0.57,1.39)	0.86 (0.56,1.34)	1.03 (0.67,1.60)
ADHD <sub>high</sub>	62	0.59 (0.21,1.61)	0.74 (0.30, 1.84)	0.49 (0.17,1.45)	0.61 (0.23,1.63)	0.57 (0.19,1.69)	0.68 (0.25, 1.88)
ADHD <sub>DSM-IV</sub>	152	0.52 (0.27,1.00)	0.59 (0.31,1.13)	0.58 (0.30,1.13)	0.62 (0.33,1.19)	0.67 (0.35,1.29)	0.77 (0.41,1.45)
<b>Any neurodevelopmental outcomes</b>							
ASD or ADHD	355	0.75 (0.50, 1.13)	0.88 (0.58, 1.33)	0.81 (0.54, 1.23)	0.92 (0.60, 1.41)	0.90 (0.60, 1.37)	1.07 (0.70, 1.62)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.

Table S3b. Crude and adjusted ORs of neurodevelopmental disorders for twins born in Stockholm, by exposure to PM<sub>10</sub> in each trimester

Outcomes	Case	PM <sub>10</sub> during 1 <sup>st</sup> trimester		PM <sub>10</sub> during 2 <sup>nd</sup> trimester		PM <sub>10</sub> during 3 <sup>rd</sup> trimester	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>							
ASD <sub>low</sub>	109	0.96 (0.49,1.89)	1.05 (0.54,2.01)	0.93 (0.45,1.92)	0.96 (0.49,1.90)	1.02 (0.48,2.13)	1.11 (0.57,2.17)
ASD <sub>high</sub>	33	0.71 (0.30, 1.72)	0.88 (0.36, 2.16)	0.48 (0.17, 1.39)	0.62 (0.22, 1.71)	0.55 (0.18, 1.65)	0.70 (0.23, 2.20)
ASD <sub>DSM-IV</sub>	47	0.83 (0.39,1.78)	0.85 (0.43,1.69)	0.66 (0.28,1.56)	0.65 (0.31,1.39)	0.74 (0.31,1.78)	0.73 (0.33,1.62)
<b>ADHD</b>							
ADHD <sub>low</sub>	328	0.77 (0.52,1.14)	0.93 (0.63,1.38)	0.84 (0.56,1.24)	0.97 (0.66,1.43)	0.93 (0.63,1.38)	1.12 (0.77,1.63)
ADHD <sub>high</sub>	62	0.55 (0.25,1.22)	0.70 (0.35,1.41)	0.49 (0.21,1.15)	0.62 (0.30,1.28)	0.52 (0.22,1.25)	0.62 (0.29,1.36)
ADHD <sub>DSM-IV</sub>	152	0.70 (0.38,1.26)	0.78 (0.45,1.36)	0.80 (0.43,1.47)	0.85 (0.49,1.49)	0.86 (0.47,1.57)	0.97 (0.56,1.68)
<b>Any neurodevelopmental outcomes</b>							
ASD or ADHD	355	0.81 (0.56, 1.17)	0.96 (0.66, 1.40)	0.86 (0.59, 1.25)	0.99 (0.68, 1.43)	0.96 (0.66, 1.39)	1.13 (0.79, 1.63)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.

Table S4a. Sensitivity analyses: crude and adjusted ORs of neurodevelopmental disorders for twins born in Stockholm, by exposure to NO<sub>x</sub> in each trimester with seasonal variation

Outcomes	Case*	NO <sub>x</sub> during 1 <sup>st</sup> trimester		NO <sub>x</sub> during 2 <sup>nd</sup> trimester		NO <sub>x</sub> during 3 <sup>rd</sup> trimester	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>							
ASD <sub>low</sub>	96	0.96 (0.47,1.96)	0.95 (0.46,1.98)	0.91 (0.43,1.92)	0.87 (0.40,1.89)	0.89 (0.40,2.00)	0.97 (0.44,2.17)
ASD <sub>high</sub>	29	0.61 (0.23, 1.65)	0.78 (0.30, 2.05)	0.33 (0.11, 1.04)	0.43 (0.13, 1.37)	0.34 (0.10, 1.16)	0.42 (0.10, 1.84)
ASD <sub>DSM-IV</sub>	43	0.81 (0.31,2.10)	0.89 (0.35,2.26)	0.55 (0.18,1.67)	0.57 (0.19,1.70)	0.64 (0.20,2.06)	0.68 (0.19,2.41)
<b>ADHD</b>							
ADHD <sub>low</sub>	303	0.70 (0.45,1.07)	0.84 (0.54,1.31)	0.75 (0.49,1.16)	0.87 (0.56,1.36)	0.85 (0.54,1.33)	1.02 (0.65,1.60)
ADHD <sub>high</sub>	56	0.57 (0.20,1.59)	0.72 (0.28, 1.84)	0.47 (0.16,1.40)	0.58 (0.21,1.58)	0.59 (0.20,1.74)	0.70 (0.25, 1.95)
ADHD <sub>DSM-IV</sub>	140	0.50 (0.25,0.98)	0.57 (0.29,1.11)	0.57 (0.29,1.11)	0.61 (0.32,1.17)	0.69 (0.36,1.33)	0.79 (0.42,1.50)
<b>Any neurodevelopmental outcomes</b>							
ASD or ADHD	328	0.76 (0.50, 1.14)	0.88 (0.58, 1.34)	0.81 (0.53, 1.22)	0.91 (0.60, 1.39)	0.89 (0.58, 1.36)	1.05 (0.68, 1.62)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

\*Case: Number of cases identified among twins with non-missing values (after imputation) for NO<sub>x</sub> exposure.

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.

Table S4b. Sensitivity analyses: crude and adjusted ORs of neurodevelopmental disorders for twins born in Stockholm, by exposure to PM<sub>10</sub> in each trimester with seasonal variation

Outcomes	Case*	PM <sub>10</sub> during 1 <sup>st</sup> trimester		PM <sub>10</sub> during 2 <sup>nd</sup> trimester		PM <sub>10</sub> during 3 <sup>rd</sup> trimester	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>							
ASD <sub>low</sub>	75	0.87 (0.38,2.01)	0.98 (0.46,2.09)	0.77 (0.30,1.97)	0.87 (0.37,2.04)	0.80 (0.31,2.10)	0.78 (0.31,1.95)
ASD <sub>high</sub>	25	0.81 (0.37, 1.79)	0.99 (0.42, 2.36)	0.60 (0.23, 1.53)	0.84 (0.39, 1.78)	0.31 (0.10, 0.99)	-
ASD <sub>DSM-IV</sub>	33	0.87 (0.41,1.87)	0.98 (0.45,2.11)	0.65 (0.27,1.55)	0.66 (0.31,1.39)	0.47 (0.18,1.19)	0.29 (0.10,0.84)
<b>ADHD</b>							
ADHD <sub>low</sub>	225	0.81 (0.50,1.31)	0.92 (0.58,1.47)	0.84 (0.54,1.32)	1.12 (0.72,1.72)	0.96 (0.61,1.52)	1.02 (0.65,1.62)
ADHD <sub>high</sub>	47	0.36 (0.15,0.88)	0.48 (0.20,1.15)	0.37 (0.16,0.89)	0.54 (0.24,1.21)	0.28 (0.09,0.91)	0.32 (0.10,1.00)
ADHD <sub>DSM-IV</sub>	106	0.58 (0.28,1.18)	0.67 (0.35,1.29)	0.67 (0.34,1.34)	0.87 (0.47,1.60)	0.83 (0.40,1.70)	0.87 (0.44,1.72)
<b>Any neurodevelopmental outcomes</b>							
ASD or ADHD	242	0.83 (0.53, 1.30)	0.95 (0.61, 1.48)	0.85 (0.55, 1.31)	1.11 (0.73, 1.70)	0.97 (0.62, 1.50)	1.02 (0.65, 1.59)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

\*Case: Number of cases identified among twins with non-missing values (after imputation) for PM<sub>10</sub> exposure.

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.

Table S5. Sensitivity analyses: crude and adjusted ORs of neurodevelopmental disorders for twins born in Stockholm, by exposure to NO<sub>x</sub> and PM<sub>10</sub> in their 9<sup>th</sup> year of lives

Outcomes	Case	NO <sub>x</sub> during 9 <sup>th</sup> year of life		PM <sub>10</sub> during 9 <sup>th</sup> year of life	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>					
ASD <sub>low</sub>	109	0.75 (0.33,1.71)	0.93 (0.42,2.06)	0.93 (0.36,2.40)	1.14 (0.48,2.71)
ASD <sub>high</sub>	33	1.07 (0.20,5.63)	1.30 (0.27, 6.21)	1.78 (0.33,9.66)	2.28 (0.50,10.35)
ASD <sub>DSM-IV</sub>	47	1.11 (0.33, 3.73)	1.23 (0.38,3.97)	1.73 (0.49,6.17)	1.97 (0.58,6.76)
<b>ADHD</b>					
ADHD <sub>low</sub>	328	0.94 (0.59,1.49)	1.14 (0.73,1.77)	1.08 (0.67,1.75)	1.27 (0.83,1.93)
ADHD <sub>high</sub>	62	0.88 (0.28,2.78)	1.04 (0.33,3.21)	0.67 (0.27,1.66)	0.77 (0.33,1.79)
ADHD <sub>DSM-IV</sub>	152	0.94 (0.50,1.76)	1.15 (0.62,2.15)	1.12 (0.57,2.20)	1.33 (0.73,2.41)
<b>Any neurodevelopmental outcomes</b>					
ASD or ADHD	355	0.93 (0.60, 1.44)	1.13 (0.74, 1.74)	1.07 (0.67, 1.70)	1.27 (0.84, 1.91)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at child's 9<sup>th</sup> year of life, parental education, family income, and neighborhood deprivation at child's 9<sup>th</sup> year of life.

Table S6. Sensitivity analyses: crude and adjusted ORs of ASD and ADHD comorbid with brain damage and chromosome abnormalities for twins born in Stockholm

Outcomes	Case*	NO <sub>x</sub> during pregnancy		NO <sub>x</sub> during infancy		PM <sub>10</sub> during pregnancy		PM <sub>10</sub> during infancy	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>									
ASD <sub>low</sub>	44	0.56 (0.22,1.46)	0.42 (0.17,1.06)	0.72 (0.29,1.78)	0.50 (0.20,1.22)	0.65 (0.27,1.60)	0.57 (0.24,1.36)	0.90 (0.39,2.11)	0.76 (0.33,1.74)
ASD <sub>DSM-IV</sub>	24	0.59 (0.19,1.78)	0.69 (0.28,1.68)	0.67 (0.23,1.98)	0.80 (0.41,1.54)	0.84 (0.27,2.56)	0.89 (0.43,1.87)	1.07 (0.35,3.27)	1.02 (0.51,2.01)
<b>ADHD</b>									
ADHD <sub>low</sub>	48	0.49 (0.19,1.28)	0.55 (0.22,1.40)	0.65 (0.25,1.65)	0.65 (0.25,1.69)	0.55 (0.22,1.39)	0.68 (0.30,1.55)	0.67 (0.27,1.67)	0.71 (0.30,1.65)
ADHD <sub>DSM-IV</sub>	34	0.43 (0.13,1.44)	0.50 (0.16,1.57)	0.59 (0.18,1.88)	0.61 (0.18,1.99)	0.53 (0.17,1.70)	0.59 (0.22,1.59)	0.67 (0.22,2.05)	0.64 (0.22,1.80)
<b>Any neurodevelopmental outcomes</b>									
ASD or ADHD	59	0.59 (0.26, 1.35)	0.55 (0.24, 1.23)	0.78 (0.35, 1.74)	0.66 (0.29, 1.51)	0.66 (0.30, 1.43)	0.71 (0.34, 1.48)	0.66 (0.30, 1.43)	0.71 (0.34, 1.48)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

\*Cases comorbid with severe chromosome abnormality, malformations of the brain, epilepsy, cerebral palsy and other neurological disorders.

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.

Table S7. Sub-analysis: crude and adjusted ORs of neurodevelopmental disorders (using validated cut-off values) for twins (n=2,960) whose mothers answered the telephone interview

Outcomes	Case	NO <sub>x</sub> during pregnancy		NO <sub>x</sub> during infancy		PM <sub>10</sub> during pregnancy		PM <sub>10</sub> during infancy	
		OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	OR <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
<b>ASD</b>									
ASD <sub>low</sub>	91	0.56 (0.22,1.41)	0.70 (0.28,1.75)	0.71 (0.34,1.48)	0.86 (0.41,1.79)	0.79 (0.33,1.89)	0.96 (0.44,2.09)	0.88 (0.46,1.66)	1.01 (0.57,1.77)
ASD <sub>high</sub>	29	0.41 (0.13,1.26)	0.45 (0.13,1.54)	0.55 (0.20,1.55)	0.51 (0.18,1.45)	0.55 (0.19,1.58)	0.59 (0.21,1.64)	0.77 (0.27,2.18)	0.72 (0.28,1.87)
ASD <sub>DSM-IV</sub>	41	0.33 (0.13,0.88)	0.36 (0.13,1.00)	0.48 (0.21,1.14)	0.48 (0.20,1.11)	0.57 (0.22,1.46)	0.56 (0.25,1.24)	0.83 (0.34,2.00)	0.76 (0.37,1.57)
<b>ADHD</b>									
ADHD <sub>low</sub>	281	0.66 (0.41,1.06)	0.87 (0.54,1.39)	0.91 (0.60,1.38)	1.16 (0.76,1.78)	0.78 (0.50,1.20)	1.01 (0.66,1.53)	0.91 (0.62,1.33)	1.13 (0.78,1.65)
ADHD <sub>high</sub>	53	0.35 (0.11,1.19)	0.50 (0.16,1.56)	0.60 (0.19,1.88)	0.79 (0.27,2.34)	0.38 (0.15,0.99)	0.55 (0.24,1.23)	0.56 (0.23,1.37)	0.72 (0.33,1.54)
ADHD <sub>DSM-IV</sub>	132	0.49 (0.23,1.04)	0.63 (0.30,1.31)	0.75 (0.39,1.43)	1.00 (0.53,1.92)	0.71 (0.36,1.41)	0.89 (0.48,1.63)	0.85 (0.47,1.57)	1.11 (0.63,1.92)
<b>Any neurodevelopmental outcomes</b>									
ASD or ADHD	303	0.66 (0.43, 1.04)	0.85 (0.54, 1.33)	0.90 (0.61, 1.34)	1.13 (0.75, 1.70)	0.78 (0.52, 1.19)	0.99 (0.66, 1.48)	0.92 (0.64, 1.32)	1.12 (0.78, 1.61)

Definition of abbreviations: ASD=Autism Spectrum Disorders, ADHD= Attention Deficit/Hyperactivity Disorders, DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), OR=Odds Ratio, CI=Confidence Interval

<sup>a</sup> Estimates based on crude models.

<sup>b</sup> Models adjusted for parity, gender, maternal age during pregnancy, maternal smoking during pregnancy, maternal marital status at birth year, parental education, family income, and neighborhood deprivation at birth year.