eTABLE1. Air quality monitoring instrumentation, network and frequency by monitoring station

AQ Variable	Site Location	Network	Method	Frequency
PM_{10}	Georgia Tech	AQS	FRM/TEOM	Daily
	Jefferson Street (ARIES)	SEARCH	FRM	Daily
	Yorkville	SEARCH	FRM	Daily
	Fulton Co. Health Dept.	AQS	FRM	Every 6th day
	Fire Station #8	AQS	FRM	Every 6th day
	Doraville Health Center	AQS	FRM	Every 6th day
	Griffin	AQS	FRM	Every 6th day
	Douglasville	AQS	FRM	Every 6th day
	E. Rivers School	AQS	FRM	Every 6th day
$PM_{2.5}$	Doraville Health Center	AQS	FRM	Daily
	East Rivers School	AQS	FRM	Daily
	South DeKalb	AQS/ASACA	FRM/TEOM	Daily
	Fort McPherson	ASACA	TEOM	Daily
	Tucker	ASACA	TEOM	Daily
	Jefferson Street (ARIES)	SEARCH	FRM	Daily
	Yorkville	SEARCH	FRM	Daily
	Fire Station #8	AQS	FRM	Every 3rd day
	East Point Health Center	AQS	FRM	Every 3rd day
	Forest Park	AQS	FRM	Every 3rd day
	Kennesaw	AQS	FRM	Every 3rd day
$PM_{2.5-10}$	Jefferson St. (ARIES)	SEARCH	Dichotomous Sampler	Daily
$PM_{2.5}$ sulfate	Jefferson St. (ARIES)	SEARCH	Particle Composition Monitor	Daily
$PM_{2.5}$ nitrate	Jefferson St. (ARIES)	SEARCH	Particle Composition Monitor	Daily
$PM_{2.5}$ total carbon	Jefferson St. (ARIES)	SEARCH	Thermal Optical Reflectance	Daily
$PM_{2.5}$ elemental carbon	Jefferson St. (ARIES)	SEARCH	Thermal Optical Reflectance	Daily
$PM_{2.5}$ organic carbon	Jefferson St. (ARIES)	SEARCH	Thermal Optical Reflectance	Daily
$PM_{2.5}$ WS metals	Jefferson St. (ARIES)	SEARCH	Particle Composition Monitor	Daily
O_3	Confederate Ave.	AQS	Chemiluminescence	Daily (not winter)
	South DeKalb	AQS	Chemiluminescence	Daily (not winter)
	Conyers	AQS	Chemiluminescence	Daily (not winter)
	Jefferson Street (ARIES)	SEARCH	UV Absorption	Daily
	Yorkville	SEARCH	UV Absorption	Daily
CO	DeKalb Tech	AQS	Infrared analyzer	Daily
	Roswell Rd.	AQS	Infrared analyzer	Daily
	South DeKalb	AQS	Infrared analyzer	Daily
	Jefferson Street (ARIES)	SEARCH	Infrared analyzer	Daily
	Yorkville	SEARCH	Infrared analyzer	Daily
SO_2	Confederate Ave.	AQS	Fluorescence	Daily
	Georgia Tech	AQS	Fluorescence	Daily
	Stilesboro	AQS	Fluorescence	Daily
	Jefferson Street (ARIES)	SEARCH	Fluorescence	Daily
	Yorkville	SEARCH	Fluorescence	Daily
NO_2	Georgia Tech	AQS	Chemiluminescence	Daily
	South DeKalb	AQS	Chemiluminescence	Daily
	Conyers	AQS	Chemiluminescence	Daily
	Tucker	AQS	Chemiluminescence	Daily
	Jefferson St. (ARIES)	SEARCH	Chemiluminescence	Daily
	Yorkville	SEARCH	Chemiluminescence	Daily

AQS = EPA Air Quality System ASACA= Assessment of Spatial Aerosol Composition in Atlanta SEARCH= Southeastern Aerosol Research and Characterization FRM = Federal Reference Method TEOM = Tapered Element Oscillating Microbalance

eTABLE 2. Descriptive statistics of daily pollution levels and monthly mean levels for the five-county Atlanta metropolitan area using a population-weighted spatial average of available monitors.

		Daily Levels		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pollutant	N*	Mean ± SD	Range												
1-hour max CO (ppm)	4017	0.89 ± 0.47	0.10 - 3.49	0.97	0.97	0.83	0.86	0.81	0.75	0.74	0.83	0.86	1.03	1.06	1.00
1-hour max NO_2 (ppb)	4015	23 ± 10	2 - 97	24	25	25	25	24	21	20	22	21	24	24	24
1-hour max SO_2 (ppb)	4001	10 ± 9	0 - 78	14	12	11	9	8	9	11	9	7	9	11	12
8-hour max O_3 (ppb)	4017	44 ± 20	1 - 115	26	31	42	49	57	56	61	63	52	39	29	24
24-hr PM_{10} ($\mu g/m^3$)	3239	24 ± 12	3 - 99	18	20	19	23	25	26	30	31	27	28	23	18
24-hr $PM_{2.5}$ ($\mu g/m^3$)	2338	16 ± 7	3 - 67	14	14	14	15	16	17	20	22	17	18	17	13
24-hr $PM_{2.5-10}$ ($\mu g/m^3$)	2183	9.0 ± 5.0	0.5 - 50.3	6.8	7.6	8.5	10.9	10.5	8.6	9.2	9.3	9.2	11.3	9.4	6.9
24-hr $PM_{2.5}$ sulfate ($\mu g/m^3$)	2135	4.9 ± 3.4	0.5 - 21.9	2.5	3.2	3.5	4.2	5.0	5.7	7.6	8.7	6.0	5.3	3.5	2.5
24-hr $PM_{2.5}$ nitrate ($\mu g/m^3$)	2127	1.0 ± 0.8	0.0 - 7.4	1.8	1.8	1.2	0.8	0.6	0.6	0.5	0.6	0.6	0.9	1.2	1.6
24-hr $PM_{2.5}$ total carbon ($\mu g/m^3$)	2258	6.0 ± 3.4	0.6 - 33.7	6.1	5.9	5.4	5.4	5.5	5.3	5.5	6.0	5.4	7.1	7.3	6.6
24-hr $PM_{2.5}$ elemental carbon ($\mu g/m^3$)	2258	1.6 ± 1.2	0.1 - 11.9	1.6	1.6	1.4	1.3	1.4	1.4	1.4	1.7	1.5	2.3	1.9	1.8
24-hr $PM_{2.5}$ organic carbon ($\mu g/m^3$)	2259	4.4 ± 2.4	0.4 - 25.9	4.5	4.3	4.0	4.1	4.1	3.9	4.0	4.3	3.9	4.9	5.3	4.8
24-hr $PM_{2.5}$ water-soluble metals † ($\mu g/m^3$)	2138	0.030 ± 0.023	0.003-0.202	0.015	0.017	0.020	0.022	0.031	0.033	0.042	0.048	0.036	0.039	0.027	0.020

*Time period: Gases 1/1/94-12/31/04, PM_{10} 1/1/96-12/31/04, $PM_{2.5}$ and components 8/1/98-12/31/04

eTABLE 3. Spearman correlation coefficients between four-week average pollutant concentrations in five-county Atlanta.

	CO	NO_2	SO_2	O_3	PM_{10}	$PM_{2.5}$	CP	SO_4	NO_3	TC	EC	OC	WSMET
N observations	3806	3780	3742	3806	2916	1994	1734	1594	1591	1951	1951	1951	1604
CO	1												
NO_2	0.36	1											
SO_2	0.44	0.37	1										
O_3	-0.29	0.00	-0.32	1									
PM_{10}	0.12	0.06	-0.17	0.78	1								
$PM_{2.5}$	0.07	0.05	-0.12	0.67	0.91	1							
CP ($PM_{2.5-10}$)	0.31	0.26	-0.17	0.48	0.71	0.53	1						
SO_4 ($PM_{2.5}$ sulfate)	-0.16	-0.15	-0.22	0.83	0.82	0.87	0.34	1					
NO_3 ($PM_{2.5}$ nitrate)	0.35	0.51	0.66	-0.68	-0.38	-0.26	-0.36	-0.52	1				
TC ($PM_{2.5}$ total carbon)	0.74	0.70	0.29	-0.09	0.45	0.39	0.36	0.04	0.24	1			
EC ($PM_{2.5}$ elemental carbon)	0.86	0.64	0.34	-0.10	0.41	0.41	0.42	0.11	0.18	0.86	1		
OC ($PM_{2.5}$ organic carbon)	0.59	0.66	0.24	-0.07	0.42	0.34	0.28	0.01	0.24	0.96	0.69	1	
WSMET ($PM_{2.5}$ WS metals)	-0.01	-0.15	-0.25	0.59	0.73	0.69	0.44	0.76	-0.53	0.12	0.25	0.05	1

Time period: gases 9/15/1993-2/15/2004 (3806 days), PM_{10} 1/1/1996-2/15/2004 (2968 days), $PM_{2.5}$ and components 9/1/1998-2/15/2004 (1994 days)

eTABLE 4. Spearman correlation coefficients between one-week average pollutant concentrations in five-county Atlanta.

	CO	NO_2	SO_2	O_3	PM_{10}	$PM_{2.5}$	CP	SO_4	NO_3	TC	EC	OC	WSMET
N observations	3834	3827	3802	3834	3017	2111	1889	1782	1781	2007	2007	2013	1789
CO	1												
NO_2	0.49	1											
SO_2	0.27	0.42	1										
O_3	-0.08	0.22	-0.11	1									
PM_{10}	0.38	0.43	0.10	0.69	1								
$PM_{2.5}$	0.37	0.39	0.11	0.62	0.91	1							
CP ($PM_{2.5-10}$)	0.40	0.45	0.07	0.46	0.74	0.53	1						
SO_4 ($PM_{2.5}$ sulfate)	0.03	0.04	-0.07	0.73	0.77	0.84	0.33	1					
NO_3 ($PM_{2.5}$ nitrate)	0.27	0.34	0.38	-0.50	-0.12	0.01	-0.17	-0.26	1				
TC ($PM_{2.5}$ total carbon)	0.74	0.74	0.27	0.13	0.61	0.54	0.49	0.21	0.22	1			
EC ($PM_{2.5}$ elemental carbon)	0.82	0.66	0.33	0.08	0.54	0.52	0.47	0.23	0.20	0.87	1		
OC ($PM_{2.5}$ organic carbon)	0.62	0.70	0.22	0.14	0.58	0.51	0.45	0.17	0.21	0.97	0.72	1	
WSMET ($PM_{2.5}$ WS metals)	0.25	0.16	0.00	0.55	0.73	0.70	0.48	0.73	-0.27	0.36	0.42	0.29	1

Time period: gases 1/1/94-6/30/2004 (3834 days), PM_{10} 2/1/1996-6/30/04 (3073 days), $PM_{2.5}$ and components 9/1/1998-6/30/2004 (2130 days)

eTABLE 5. Spearman correlation coefficients between six-week average pollutant concentrations in five-county Atlanta.

	CO	NO_2	SO_2	O_3	PM_{10}	$PM_{2.5}$	CP	SO_4	NO_3	TC	EC	OC	WSMET
N observations	3834	3834	3736	3834	2976	2130	1731	1533	1531	2047	2047	2047	1540
CO	1												
NO_2	0.31	1											
SO_2	0.42	0.34	1										
O_3	-0.33	-0.07	-0.39	1									
PM_{10}	0.16	0.10	-0.18	0.76	1								
$PM_{2.5}$	0.26	0.13	-0.05	0.68	0.91	1							
CP ($PM_{2.5-10}$)	0.30	0.23	-0.25	0.50	0.69	0.51	1						
SO_4 ($PM_{2.5}$ sulfate)	-0.08	-0.27	-0.31	0.83	0.83	0.88	0.34	1					
NO_3 ($PM_{2.5}$ nitrate)	0.40	0.53	0.68	-0.69	-0.47	-0.30	-0.40	-0.54	1				
TC ($PM_{2.5}$ total carbon)	0.77	0.69	0.28	-0.12	0.38	0.36	0.32	-0.04	0.26	1			
EC ($PM_{2.5}$ elemental carbon)	0.90	0.61	0.34	-0.08	0.40	0.46	0.41	0.18	0.20	0.85	1		
OC ($PM_{2.5}$ organic carbon)	0.58	0.64	0.21	-0.13	0.32	0.25	0.22	-0.15	0.26	0.95	0.64	1	
WSMET ($PM_{2.5}$ WS metals)	0.11	-0.19	-0.28	0.61	0.73	0.73	0.42	0.80	-0.47	0.10	0.36	-0.07	1

Time period: gases 1/1/94-6/30/2004 (3834 days), PM_{10} 2/1/1996-6/30/04 (3073 days), $PM_{2.5}$ and components 9/1/1998-6/30/2004 (2130 days)

eTABLE 6. Monitor-specific risk ratio and 95% confidence intervals* for preterm birth for births within four miles of the station†

Pollutant Monitor	Dates of Operation	First month of gestation		Final week of gestation		Final 6 weeks of gestation	
		RR (95% CI)	pvalue	RR (95% CI)	pvalue	RR (95% CI)	pvalue
CO DeKalb Tech	9/93- 6/03	0.97 (0.92, 1.01)	0.13	1.03 (1.00, 1.06)	0.07	1.06 (0.99, 1.13)	0.08
CO Roswell Rd.	8/94-12/04	0.98 (0.90, 1.06)	0.58	0.98 (0.93, 1.03)	0.33	0.94 (0.85, 1.05)	0.26
CO Jefferson St.	8/98-12/04	1.02 (0.96, 1.07)	0.53	1.01 (0.98, 1.05)	0.53	0.99 (0.93, 1.06)	0.83
NO_2 Georgia Tech	9/93-12/04	1.02 (0.98, 1.06)	0.30	1.02 (0.98, 1.06)	0.35	1.06 (1.00, 1.12)	0.04
NO_2 Jefferson St.	8/98-12/04	1.02 (0.94, 1.10)	0.70	1.04 (0.97, 1.11)	0.30	1.02 (0.92, 1.13)	0.74
NO_2 Tucker	4/95-12/04	1.01 (0.96, 1.07)	0.62	1.00 (0.94, 1.05)	0.87	1.07 (1.00, 1.15)	0.06
NO_2 South DeKalb	9/93-12/04	1.00 (0.95, 1.04)	0.87	1.01 (0.96, 1.05)	0.80	1.06 (0.99, 1.12)	0.08
O_3 Confederate Ave.	9/93-12/04‡	0.91 (0.78, 1.07)	0.91	0.97 (0.88, 1.07)	0.51	1.00 (0.80, 1.24)	0.99
O_3 South DeKalb	9/93-12/04‡	1.03 (0.75, 1.42)	0.84	1.12 (0.97, 1.28)	0.12	0.87 (0.63, 1.20)	0.39
O_3 Jefferson St.	8/98-12/04	0.94 (0.76, 1.17)	0.60	0.97 (0.84, 1.12)	0.67	1.42 (1.05, 1.91)	0.02
SO_2 Confederate Ave.	9/93-12/04	0.99 (0.95, 1.04)	0.83	0.96 (0.91, 1.00)	0.04	0.96 (0.91, 1.02)	0.24
SO_2 Jefferson St.	8/98-12/04	1.03 (0.96, 1.10)	0.39	1.03 (0.98, 1.09)	0.26	0.98 (0.92, 1.04)	0.53
SO_2 Georgia Tech	9/93-12/04	0.99 (0.93, 1.05)	0.63	1.01 (0.96, 1.06)	0.77	1.01 (0.95, 1.08)	0.71
PM_{10} Jefferson St.	8/98-12/04	1.04 (0.85, 1.28)	0.67	1.11 (0.99, 1.24)	0.07	0.98 (0.73, 1.31)	0.88
PM_{10} Georgia Tech	1/96-12/04	1.08 (0.99, 1.18)	0.10	1.03 (0.96, 1.12)	0.39	1.02 (0.89, 1.17)	0.78
$PM_{2.5}$ Jefferson St.	8/98-12/04	1.09 (0.98, 1.21)	0.11	1.06 (0.98, 1.14)	0.13	1.07 (0.92, 1.24)	0.41
$PM_{2.5}$ Doraville Heath Center	3/99-12/04	0.86 (0.74, 1.01)	0.07	1.02 (0.93, 1.11)	0.69	1.10 (0.85, 1.43)	0.46
$PM_{2.5}$ South DeKalb	3/99-12/04	0.92 (0.79, 1.06)	0.26	0.95 (0.86, 1.04)	0.23	1.24 (0.89, 1.71)	0.20
$PM_{2.5}$ Tucker	3/99-12/04	0.92 (0.77, 1.09)	0.34	1.02 (0.93, 1.12)	0.69	1.00 (0.82, 1.23)	0.99
$PM_{2.5}$ East Rivers School	3/99-12/04	0.94 (0.74, 1.20)	0.64	0.87 (0.77, 0.99)	0.03	1.08 (0.78, 1.49)	0.64
$PM_{2.5}$ Fort McPherson	3/99-12/04	1.05 (0.90, 1.23)	0.53	0.98 (0.89, 1.08)	0.67	0.96 (0.76, 1.22)	0.73
$PM_{2.5-10}$ Jefferson St.	8/98-12/04	1.03 (0.95, 1.12)	0.46	1.03 (0.97, 1.10)	0.30	1.07 (0.97, 1.18)	0.21
$PM_{2.5}$ EC Jefferson St.	8/98-12/04	1.01 (0.93, 1.10)	0.76	1.04 (0.98, 1.10)	0.20	0.97 (0.86, 1.08)	0.55
$PM_{2.5}$ NO_3 Jefferson St.	8/98-12/04	1.03 (0.89, 1.20)	0.68	0.98 (0.90, 1.08)	0.73	0.86 (0.71, 1.04)	0.11
$PM_{2.5}$ OC Jefferson St.	8/98-12/04	1.02 (0.94, 1.10)	0.66	1.01 (0.95, 1.08)	0.75	0.98 (0.89, 1.07)	0.62
$PM_{2.5}$ SO_4 Jefferson St.	8/98-12/04	1.06 (0.94, 1.20)	0.32	1.09 (1.01, 1.19)	0.03	0.93 (0.77, 1.11)	0.42
$PM_{2.5}$ TC Jefferson St.	8/98-12/04	1.02 (0.95, 1.09)	0.67	1.02 (0.96, 1.09)	0.53	0.97 (0.88, 1.08)	0.59
$PM_{2.5}$ WS metals Jefferson St.	8/98-12/04	1.07 (0.93, 1.24)	0.32	1.11 (1.02, 1.22)	0.02	0.89 (0.72, 1.09)	0.26

* Risk ratio and 95% CI's corresponds to a window-specific IQR increase in pollutant levels (shown in Table 2).
† Pooled inverse-variance weighted risk ratios for each pollutant and exposure window presented in Table 4.
‡ Did not operate in winter months

eAppendix. Description of population-weighted spatial averaging

In the five-county analyses, daily pollutant concentrations were characterized using a population-weighted spatial average of measurements from all air quality monitors in the study area. We calculated the daily population-weighted spatial averages using the following approach, described in detail by Ivy and colleagues.[1]

1. First, log-transformed pollutant values, on each day, *k*, at each monitoring station, *i*, were standardized using the annual mean and standard deviation at the monitor

$$\beta_{i,k} = \frac{\left(x_{i,k} - E(x_i)\right)}{\sqrt{\text{var}(x_i)}}$$

   where $\beta_{i,k}$ is the standardized pollutant value at monitor *i* on day *k*, $x_{i,k}$ is the log-transformed pollutant concentration at monitor *i* on day *k*, the annual mean of $\beta_i=0$, the annual variance of $\beta_i=1$
2. For each census tract in the study area we created a distance-weighted average of the standardized values from each monitoring station
3. We then converted the standardized value at each census tract back into a pollutant concentration using pollutant-specific distance-decay functions from the most central urban monitor
4. Finally we averaged the pollution values across census tracts, weighting by population counts from the 2000 census

$$C_k = \frac{\sum_j C_{j,k} P_j}{\sum_j P_j}$$

   where C_k is the population-weighted concentration for the five-county Atlanta area on day *k*, P_j is the population in census track *j*, and $C_{j,k}$ is the concentration in census tract *j* on day *k*

1. Ivy D, Mulholland J, Russell A. Development of Ambient Air Quality Population-Weighted Metrics for Use in Time-Series Health Studies. *J Air Waste Manage Assoc* 2008;**58**:711-720.

***Response to Reviewers**

Item not required

***Main Text with highlights showing changes**

Item not required