

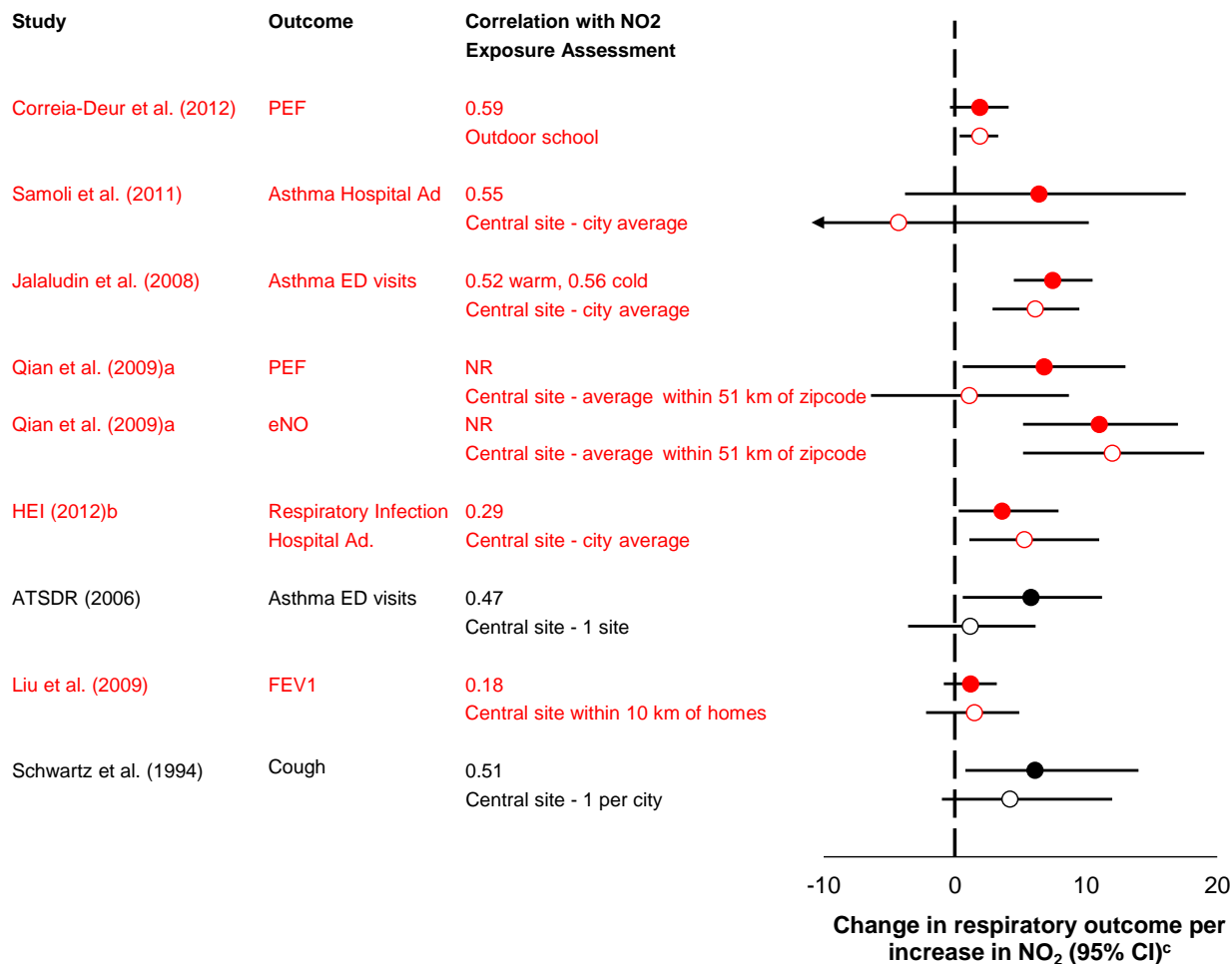
### Supplemental Figure S5-1a. Associations of ambient NO<sub>2</sub> with respiratory outcomes adjusted for PM<sub>10</sub> or PM<sub>10-2.5</sub>

Note: Magnitude and precision of effect estimates should not be compared among different outcomes. Results are organized by copollutant analyzed, then by exposure assessment method. Percent change in EBC pH, FEV<sub>1</sub>, and PEF refers to percent decrease. Studies in Red = recent studies, Studies in Black = Studies reviewed in the 2008 ISA for Oxides of Nitrogen. Effect estimates in Closed Circles = NO<sub>2</sub> in a single-pollutant model, Effect estimates in Open Circles = NO<sub>2</sub> effect estimate adjusted for a copollutant. TWA = Time-weighted average, EBC = Exhaled breath condensate, FEV<sub>1</sub> = Forced Expiratory Volume in 1 second, PEF = Peak Expiratory Flow, eNO = Exhaled nitric oxide, Hospital Ad = Hospital Admission, NR = Not reported.

<sup>a</sup>To fit results on the plot, results are multiplied by 10.

<sup>b</sup>To fit results on the plot, results are divided by 10.

<sup>c</sup>Single- and co-pollutant model results are standardized to a 20-ppb increase in 24-h avg NO<sub>2</sub> and 30-ppb increase in 1-h max NO<sub>2</sub>. Results based on other averaging times are not standardized but presented as reported in their respective studies. Quantitative data are reported in the table that follows the plots.



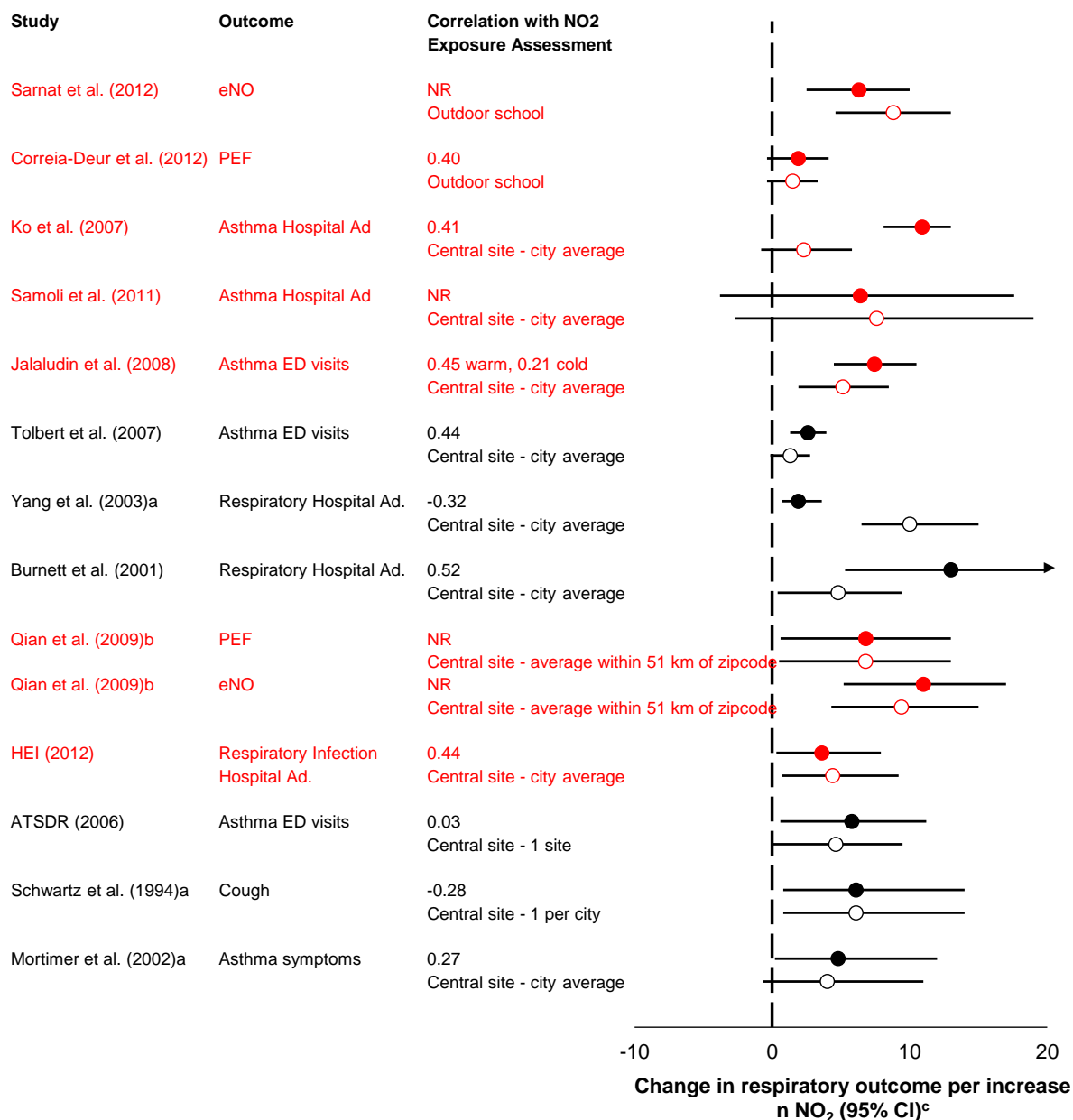
### Supplemental Figure S5-1b. Associations of ambient NO<sub>2</sub> with respiratory outcomes adjusted for SO<sub>2</sub>

Note: Magnitude and precision of effect estimates should not be compared among different outcomes. Results are organized by copollutant analyzed, then by exposure assessment method. Percent change in PEF and FEV<sub>1</sub> refers to percent decrease. Studies in Red = recent studies, Studies in Black = Studies reviewed in the 2008 ISA for Oxides of Nitrogen. Effect estimates in Closed Circles = NO<sub>2</sub> in a single-pollutant model, Effect estimates in Open Circles = NO<sub>2</sub> effect estimate adjusted for a copollutant. PEF = Peak Expiratory Flow, Hospital Ad = Hospital Admission, eNO = Exhaled nitric oxide, FEV<sub>1</sub> = Forced Expiratory Volume in 1 second, NR = Not reported.

<sup>a</sup>To fit results on the plot, results are multiplied by 10.

<sup>b</sup>To fit results on the plot, results are divided by 10.

<sup>c</sup>Single- and co-pollutant model results are standardized to a 20-ppb increase in 24-h avg NO<sub>2</sub> and 30-ppb increase in 1-h max NO<sub>2</sub>. Results based on other averaging times are not standardized but presented as reported in their respective studies. Quantitative data are reported in the table that follows the plots.



### Supplemental Figure S5-1c. Associations of ambient NO<sub>2</sub> with respiratory outcomes adjusted for O<sub>3</sub>

Note: Magnitude and precision of effect estimates should not be compared among different outcomes. Results are organized by copollutant analyzed, then by exposure assessment method. Percent change in PEF refers to percent decrease. Studies in Red = recent studies, Studies in Black = Studies reviewed in the 2008 ISA for Oxides of Nitrogen. Effect estimates in Closed Circles = NO<sub>2</sub> in a single-pollutant model, Effect estimates in Open Circles = NO<sub>2</sub> effect estimate adjusted for a copollutant. eNO = Exhaled nitric oxide, PEF = Peak Expiratory Flow, Hospital Ad = Hospital Admission, NR = Not reported.

<sup>a</sup>To fit results on the plot, results are multiplied by 10.

<sup>b</sup>To fit results on the plot, results are divided by 10.

<sup>c</sup>Single- and co-pollutant model results are standardized to a 20-ppb increase in 24-h avg NO<sub>2</sub> and 30-ppb increase in 1-h max NO<sub>2</sub>. Results based on other averaging times are not standardized but presented as reported in their respective studies. Quantitative data are reported in the table that follows the plots.

## Corresponding effect estimates for NO<sub>2</sub>-associated respiratory outcomes in single- and co-pollutant models.

Study	Respiratory Outcome	NO <sub>2</sub> Averaging Time and Lag	Exposure Assessment Method	Correlation with NO <sub>2</sub>	Percent change in outcome (95% CI) per increase in NO <sub>2</sub> <sup>a</sup>	
					Single-pollutant model	Copollutant model
<a href="#">Martins (2013); Martins et al. (2012)</a>	EBC pH	24-h avg Lag 0-4 day avg	Individual TWA from outdoor monitoring, modeling, time activity data	-0.72 to -0.55 across time periods	2.6 (1.3, 3.9)	w/ PM <sub>10</sub> -0.30 (-3.6, 3.0)
	FEV <sub>1</sub>			22 (1.5, 38)	w/ PM <sub>10</sub> 27 (-60, 67)	
<a href="#">Correia-Deur et al. (2012)</a>	PEF	24-h avg Lag 0 day	Outdoor school	0.6	1.9 (-0.38, 4.1)	w/ PM <sub>10</sub> 0.75 (-3.1, 4.4)
				0.59		w/ SO <sub>2</sub> 1.9 (0.37, 3.3)
				0.4		w/ O <sub>3</sub> 1.5 (-0.38, 3.3)
<a href="#">Faustini et al. (2013)</a>	Respiratory Hospital Admissions	24-h avg Distributed lag 0-5 days	Central site: city average	0.22-0.79 across cities	4.6 (0.87, 8.3)	w/ PM <sub>10</sub> 3.3 (-1.1, 7.8)
<a href="#">Samoli et al. (2011)</a>	Asthma Hospital Admissions	1-h max Lag 0 day	Central site: city average	NR	6.4 (-3.8, 18)	w/ PM <sub>10</sub> 3.1 (-7.3, 15)
				0.55		w/ SO <sub>2</sub> -4.3 (-17, 10)
				NR		w/O <sub>3</sub> 7.6 (-2.7, 19)
<a href="#">Jalaludin et al. (2008)</a>	Asthma ED visits	1-h max Lag 0-1 day avg	Central site: city average	0.44 warm, 0.67 cold	7.4 (4.5, 10)	w/ PM <sub>10</sub> 5.1 (1.9, 8.5)
				0.52 warm, 0.56 cold		w/ SO <sub>2</sub> 6.2 (2.9, 9.5)
				0.45 warm, 0.21 cold		w/O <sub>3</sub> 5.1 (1.9, 8.5)
<a href="#">Tolbert (2009); (2007)</a>	Respiratory hospital admissions	1-h max Lag 0-2 day avg	Central sites: city average	0.53	2.6 (1.3, 3.9)	w/ PM <sub>10</sub> 0.91 (-0.52, 2.4)
				0.44		w/O <sub>3</sub> 1.3 (-0.13, 2.8)
<a href="#">Burnett et al. (1997)</a>	Respiratory hospital admissions	24-h avg Lag 0-4 avg	Central site: city average	0.61	17 (13, 20)	w/ PM <sub>10</sub> 14 (9.0, 20)
				0.57		w/ PM <sub>10-2.5</sub> 14 (8.7, 18)
<a href="#">Qian et al. (2009b)</a>	PEF	24-h avg Lag 0 day	Central site: average of sites within 51 km of zipcode centroid	NR	6.8 (0.60, 13) <sup>b</sup>	w/ PM <sub>10</sub> 8.0 (-1.0, 17) <sup>b</sup>
						w/ SO <sub>2</sub> 1.1 (-6.4, 8.7) <sup>b</sup>
						w/ O <sub>3</sub> 6.8 (0.50, 13) <sup>b</sup>
<a href="#">Qian et al. (2009a)</a>	eNO				11 (5.2, 17) <sup>b</sup>	w/ PM <sub>10</sub> 6.9 (0.90, 15) <sup>b</sup>
						w/ SO <sub>2</sub> 12 (5.2, 19) <sup>b</sup>
						w/ O <sub>3</sub> 9.4 (4.3, 15) <sup>b</sup>
<a href="#">HEI Collaborative</a>	Respiratory Infection	24-h avg Lag 1-6 day avg	Central site: city average	0.78	3.6 (0.3, 7.9) <sup>c</sup>	w/ PM <sub>10</sub> 8.9 (2.6, 19) <sup>c</sup>

Study	Respiratory Outcome	NO <sub>2</sub> Averaging Time and Lag	Exposure Assessment Method	Correlation with NO <sub>2</sub>	Percent change in outcome (95% CI) per increase in NO <sub>2</sub> <sup>a</sup>	
					Single-pollutant model	Copollutant model
<a href="#">Working Group (2012)</a>	Hospital Admissions			0.29		w/ SO <sub>2</sub> 5.3 (1.1, 11) <sup>c</sup>
				0.44		w/ O <sub>3</sub> 4.4 (0.75, 9.2) <sup>c</sup>
<a href="#">ATSDR (2006)</a>	Asthma ED visits	24-h avg Lag 0-4 day avg	Central site: 1 site	0.47	5.8 (0.59, 11)	w/ SO <sub>2</sub> 1.2 (-0.84, 3.2)
				0.47		w/ O <sub>3</sub> 4.6 (0, 9.5)
<a href="#">Iskandar et al. (2012)</a>	Asthma hospital admissions	24-h avg Lag 0-4 day avg	Central site within 15 km of hospital	0.43	30 (10, 60)	w/ PM <sub>10</sub> 27 (3.1, 55)
<a href="#">Schwartz et al. (1994)</a>	Cough	24-h avg Lag 0-3 day avg	Central site: 1 site per city	0.35	6.1 (0.80, 14) <sup>c</sup>	w/ PM <sub>10</sub> 3.7 (-1.2, 11) <sup>c</sup>
				0.51		w/ SO <sub>2</sub> 4.2 (-0.98, 12) <sup>c</sup>
				-0.28		w/ O <sub>3</sub> 6.1 (0.80, 14) <sup>c</sup>
<a href="#">Liu et al.</a>	eNO	24-h avg Lag 0 day	Central site: 1 site per city	0.59	All subjects 43 (26, 62) With asthma 51 (-11, 154)	w/ PM <sub>10</sub> 34 (15, 56) 22 (-37, 137)
<a href="#">Peacock et al. (2011)</a>	Symptomatic fall in PEF	1-h max Lag 1 day	Central site: 1 site	NR	13 (-3, 31)	w/ PM <sub>10</sub> -3 (-19, 16)
<a href="#">Mann et al. (2010)</a>	Wheeze	24-h avg Lag 2 days	Central site: within 20 km of homes	0.12	24 (5.0, 48)	w/ PM <sub>10-2.5</sub> 14 (-5.0, 37)
<a href="#">Liu (2013); Liu et al. (2009)</a>	FEV <sub>1</sub>	24-h avg Lag 0-2 day avg	Central site within 10 km of homes	0.18	1.2 (-0.84, 3.2)	w/ SO <sub>2</sub> 1.5 (-2.2, 4.9)
<a href="#">Sarnat et al. (2012)</a>	eNO	24-h avg Lag 0-4 day avg	Outdoor school	NR	6.3 (2.5, 10)	8.8 (4.6, 13)
<a href="#">Ko et al. (2007)</a>	Asthma Hospital Admissions	24-h avg Lag 0-4 day avg	Central site: city average	0.41	11 (8.1, 13)	w/ O <sub>3</sub> 2.3 (-0.80, 5.8)
<a href="#">Yang et al. (2003)</a>	Respiratory Hospital Admissions	24-h avg Lag 1 day	Central site: city average	-0.32	1.9 (0.74, 3.6) <sup>c</sup>	w/ O <sub>3</sub> 10 (6.5, 15) <sup>c</sup>
<a href="#">Burnett et al. (2001)</a>	Respiratory Hospital Admissions	Lag 0-1 day avg	Central site: city average	0.52	13 (5.3, 22)	w/ O <sub>3</sub> 4.8 (0.39, 9.4)
<a href="#">Mortimer et al. (2002)</a>	Asthma Symptoms	4-h avg (6-10 a.m.) Lag 1-6 day avg	Central site: city average	0.27	4.8 (0.20, 12) <sup>c</sup> per 20 ppb NO <sub>2</sub>	w/ O <sub>3</sub> 4.0 (-0.70, 11) <sup>c</sup>

TWA = Time-weighted average, EBC = Exhaled breath condensate, FEV<sub>1</sub> = Forced Expiratory Volume in 1 second, PEF, Peak Expiratory Flow, eNO = Exhaled nitric oxide, Hospital Ad = Hospital Admission, NR = Not reported.

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