Supplemental Table S4-2. Epidemiologic Studies of Short-term Exposure to Oxides of Nitrogen and Mortality Not Included in the ISA

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
Almeida et al. (2011)	Oporto, Portugal (2000-2004)	Total Cardiovascular Respiratory	24-h avg	23.7	75^{th}: 31.9 Max: 131.9	Average of 3 monitors	**Lag 0-1** **Total:** 2.1% (0.1, 5.1) **Cardiovascular:** 3.7% (-1.9,6.9) **Respiratory:** 1.1% (-2.5, 8.4)
Balakrishnan et al. (2011)	Chennai, India (2002-2004)	Total	24-h avg	8.0-16.6	36.7-49.5	Average of 5 monitors	No NO_2 effect estimates
Barceló et al. (2009)	Barcelona, Spain (1994-2003)	Total Cardiovascular Respiratory	24-h avg	35.0	75^{th}: 41.5 Max: 113.3	Average of 25 stations	No NO_2 effect estimates
Barman et al. (2010)	Lucknow, India (2006)	Not measured	24-h avg	NO_X: 18.0	---	Average of 10 city-wide monitors	No mortality effect estimates
Breitner et al. (2009)	Erfurt, Germany (1991-2002)	Total	24-h avg	18.7	---	State-run monitoring station	**RR:** **O-5 DL;** **Total:** 1.03 (0.96, 1.09) **0-14 DL;** **Total:** 1.09 (1.00, 1.20)
Chen et al. (2008)	Shanghai, China (2001-2004)	Total Cardiovascular Respiratory	24-h avg	35.4	75^{th}: 42.1 Max: 134.9	Average of 6 urban monitors	**Lag 0-1** **Total:** 3.7% (2.5, 4.9) **Cardiovascular:** 3.9% (2.1, 5.6) **Respiratory:** 4.7% (1.6, 7.8)
Chen et al. (2010)	Anshan, China (2004-2006)	Total Cardiovascular Respiratory	24-h avg	13.6	75^{th}: 17.6 Max: 61.7	Average of 6 monitors	**Lag 0-1** **Total:** 5.0% (-0.2, 10.4) **Cardiovascular:** 8.2% (0.8, 15.9) **Respiratory:** -0.7% (-18.8, 20.2)
Faustini et al. (In Press)	10 Italian Cities (2001-2005)	Total Respiratory	24-hr avg	13.8 – 35.0	---	Average of varying number of monitors(>1) in each city	No NO_2 single-pollutant effect estimates
Faustini et al. (2012)	Rome, Italy (2005-2009)	Total Cardiac Cerebrovascular Respiratory	24-h avg	32.1	75^{th}: 38.2 95^{th}: 47.3 Max:62.4	Average of 3 monitors	**Lag 0-5** **Total:** *COPD:* 11.5 % (1.7, 22.2) *Non-COPD:* 6.3% (2.0, 10.6) **Cardiac:** *COPD:* -1.7% (-17.1, 16.7) *Non-COPD:* 7.2% (-0.2, 15.4)

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
							Cerebrovascular: *COPD:* 12.4% (-22.4, 62.9) *Non-COPD:* -0.3% (-12.2, 13.1) **Respiratory:** *COPD:* 32.2% (5.5, 65.5) *Non-COPD:* 4.7% (-14.1, 27.6)
Faustini et al. (2013)	6 Italian Cities (2001-2005)	Respiratory	24-h avg	24.5-35.1	---	Exposure data obtained from Italy's Regional Environmental Agencies	**Lag 0-5** **Respiratory:** 24.4% (7.4, 44.2)
Grass and Cane (2008)	Santiago, Chile (1988-1996)	Total Cardiovascular Respiratory	24-h avg	19-45	---	Urban park monitoring station	No NO_2 effect estimates
Guo et al. (2010)	Tianjin, China (2005-2007)	Cardiovascular	24-h avg	25	75^{th}: 29.8 Max: 72.3	City environmental monitoring center	**Lag 0** **Cardiovascular** **Time Series** **RR:** 1.04 (1.00, 1.08) **Case-Crossover** **OR:** 1.06 (1.02, 1.10)
Hu et al. (2008)	Sydney, Australia (1994-2004)	Total	24-h avg	8.7	75^{th}: 10.0 Max: 22.2	Average of 13 monitors	**Lag 0** **Total:** -3.2% (-11.3, 5.7)
Huang et al. (2009)	Shanghai, China (2004-2005)	Total Cardiovascular Respiratory	24-h avg	32.9	75^{th}: 40.0 Max: 91.1	Fixed-site monitoring station	No NO_2 effect estimates
Janke et al. (2009)	United Kingdom (1998-2005)	Total Cardiovascular Respiratory	24-h avg	19.5	---	Weighted average of 174 country-wide monitors	**Lag NR** **Total:** 1.3% (SE: 0.28) **Circulatory:** 1.3% (SE: 0.49) **CHD:** 1.0% (SE: 0.65) **MI:** -7.0% (SE: 1.27) **Stroke:** 3.1% (SE: 0.91) **Respiratory:** 7.4% (SE: 1.27)
Klemm et al. (2011)	Atlanta, Georgia (1998-2007)	Total Circulatory Respiratory	1-h max	41.1	75^{th}: 50.8 Max: 109.2	Taken from the EPA's Federal Reference Method	Mean Effect: 0.0086 (t-value=0.55)
Kowalska et al. (2010)	Katowice, Poland (2001-2002)	Total	24-h avg	NO_X: 26.5	NO_X 95^{th}: 59.3 NO_X Max: 134.9	Average of 11 city-wide monitors	Lag 0-6: NO_X Regression coefficient: 0.002 95% CI: (0.001, 0.003)
(Liang et al., 2009)	Central Taiwain (1997-1999)	Total Cardiovascular Respiratory	24-h avg	Seasonal Averages: 17.8-28.3	Seasonal Max: 37.2-57.5	Average of 5 monitors	**Winter** **RRs;** **Total (Lag 0-2):** 1.18 (1.05, 1.33) **Cardiovascular (Lag 1):**

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
							1.31 (1.09, 1.59) **Respiratory (Lag 0-2):** 1.21 (0.86, 1.80)
Lopez-Villarrubia et al. (2010)	Las Palmas de Gran Canaria and Santa Cruz de Tenerife, Canary Islands (2000-2004)	Total Cardiovascular Respiratory	24-h avg	16.1-24.4	49.6-55.7	Average of 2 monitors ins S/C de Tenerife; 1 monitor in L/P de Gran Canaria	**0-5 DL;** **L/P de Gran Canaria** **Total:** -7.9% (-15.2, 0.1) **Cardiovascular:** 1.3% (-14.6, 20.2) **Respiratory:** -24.1% (-42.5, 0.2) **S/C de Tenerife** **Total:** -3.3% (-11.1, 5.13) **Cardiovascular:** 2.3% (-15.0, 23.1) **Respiratory:** 9.2% (-16.1, 42.1)
Madsen et al. (2012)	Oslo, Norway (1992-2001)	Total Circulatory Respiratory	24-h avg Peak times	24-h: 19.5 Peak: 29.2	---	Modeled by the Norwegian Institute of Air Research	**Lag 0-5;** **Total:** *24-h:* 2.3% (-4.1, 8.9) *Peak:* 5.8% (1.5, 10.1) **Circulatory:** *24-h:* 1.2% (-7.3, 11.8) *Peak:* 6.2% (0.0, 12.6) **Respiratory:** *24-h:* -2.2% (-17.5, 15.5) *Peak:* 3.8% (-7.0, 15.1)
Ou et al. (2008)	Hong Kong, China (1998)	Total	24-h avg	29.5	75^{th}: 35.2 Max: 66.8	Average of 8 monitors	**Lag NR** **Total:** ***No Education:*** 1.6% (-5.2, 8.8) ***Primary Education:*** 7.1% (0.5, 14.0) ***Secondary Education+:*** -2.5% (-10.6, 6.5)
Ou et al. (2012)	Hong Kong, China (1998)	Total	24-h avg	29.5	75^{th}: 35.2 Max: 66.8	Average of 8 monitors	Effect Modification by Food Consumption: **Lag 0-2:** **Fish:** 0.1 (-1.9, 2.0) **Meat:** 1.2 (-0.8, 3.3) **Vegetables:** -1.3 (-4.4, 1.8) **Fruits:** -1.9 (-3.2, -0.5) **Soy:** -1.7 (-2.6, -0.8) **Dairy Products:** 0.6 (0.04, 1.2)
Peters et al. (2009)	Erfurt, Germany (1991-2002)	Total Cardiovascular Cardiorespiratory	24-h avg	18.7	95^{th}: 34.7	Average of 3 monitors	**Lag 4** **Total:** 2.7% (-1.0, 6.4) **Cardiovascular:** 4.2% (0.2, 9.2) **Cardiorespiratory:** 3.7% (-0.4, 8.0)

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
Qian et al. (2013)	Shanghai, China (2003-2008)	Stroke	24-h avg	31.0	75^{th}: 37.4 Max:114.9	Average of 6 monitors	**Stroke (Lag 0):** 3.2% (1.5, 4.9) **Ischaemic Stroke (Lag 0):** 3.5% (0.9, 6.1) **Haemorrhagic Stroke (Lag 2):** 4.4% (0.9, 7.9)
Qian et al. (2008)	Wuhan, China (2001-2004)	Total Cardiovascular Stroke Cardiac Respiratory Cardiopulmonary	24-h avg	28.1	---	Average of 5 monitors	**Lag 0-1** **Total:** 7.3% (4.7, 10.0) **Cardiovascular:** 7.3% (3.6, 11.1) **Stroke:** 7.5% (3.1, 12.0) **Cardiac:** 7.4% (1.2, 14.0) **Respiratory:** 14.4% (6.5, 22.9) **Cardiopulmonary:** 8.2% (4.7,11.9)
Qian et al. (2007)	Wuhan, China (2000-2004)	Total Cardiovascular Stroke Cardiac Respiratory Cardiopulmonary	24-h avg	27.6	75^{th}: 33.0 Max: 67.8	Average of 5 monitors	**Lag 0** **Total:** 5.5% (3.3, 7.7) **Cardiovascular:** 6.3% (3.3, 9.5) **Stroke:** 5.7% (2.1, 9.4) **Cardiac:** 6.8% (1.7, 12.2) **Respiratory:** 8.6% (2.0, 15.7) **Cardiopulmonary:** 6.1% (3.2, 9.1)
Qian et al. (2010a)	Wuhan, China (2000-2004)	Total Cardiovascular Respiratory Cardiac Stroke Cardiopulmonary Non-cardiopulmonary	24-h avg	27.6	75^{th}: 33.0 Max: 67.8	Average of 5 monitors	**Lag 0-1** **Total:** 7.6% (5.0, 10.2) **Cardiovascular:** 8.2% (4.5, 12.0) **Stroke:** 8.4% (4.1, 12.9) **Cardiac:** 7.8% (1.7, 14.3) **Respiratory:** 14.6% (6.9, 22.9) **Cardiopulmonary:** 8.4% (4.9, 12.0)
Qian et al. (2010b)	Wuhan, China (2000-2004)	Total Cardiovascular Respiratory Stroke	24-h avg	27.6	75^{th}: 33.0 Max: 67.8	Average of 5 monitors	**Lag 0-1** **Winter;** **Total:** 12.9% (9.2, 16.8) **Cardiovascular:** 14.8% (9.7, 20.1) **Stroke:** 15.3% (9.2, 21.7)

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
							Respiratory: 19.2% (9.1, 30.3)
Rajarathnam et al. (2011)	Delhi, India (2002-2004)	Total	24-h avg	26.6	Max: 84.6	Average of 10 monitors	No NO_2 single-pollutant effect estimates
Reyna et al. (2012)	Mexicali, Mexico (2003-2007)	Total	24-h avg	21.0	75^{th}: 28.0 90^{th}: 35.0 Max: 55.0	Average of 6 monitors	Winter (Lag 0): Beta: 0.1158 SE: 1.31 Summer (Lag 0): Beta: 3.97 SE: 1.64
Zauli Sajani et al. (2011)	Emilia-Romagna, Italy (2002-2006)	Total	24-h avg	Median: 26.6	95^{th}: 41.5	Various averaging strategies of up to 22 monitors	No NO_2 single-pollutant effect estimates
Son et al. (2012)	Seoul, South Korea (2000-2007)	Total Cardiovascular Respiratory	24-h avg	19.6	---	Average of 27 monitors	Study did not present IQRs to standardize effect estimates. Total (Lag 0): 2.3% (1.0, 3.5) Cardiovascular (Lag 0): 4.8% (2.2, 7.5) Respiratory (Lag 1): 2.4 (-1.7, 6.7)
Tao et al. (2012)	4 Chinese Cities (2006-2008)	Total Cardiovascular Respiratory	24-h avg	20.3-37.4	---	Average of 5 monitors	**Lag 0-1** **Total:** 7.5% (6.2, 8.9) **Cardiovascular:** 8.2% (6.1, 10.3) **Respiratory:** 13.7% (10.7, 16.9)
Thach et al. (2010)	Hong Kong, China (1996-2002)	Cardio-respiratory	24-h avg	31.2	---	Average of 8 monitors	**Lag 0-1** **Stroke:** 4.3% (0.7, 8.0) **Heart Disease:** 8.0% (4.2, 12.0) **LRI:** 6.7% (2.8, 10.8) **Respiratory:** 5.3% (0.7, 10.2)
Tsai et al. (2010)	Taichung, Taiwan (1993-2006)	Total Cardiovascular Cerebrovascular	24-h avg	28.7	Max: 80.5	1 fixed-site monitor	**Lag 1** **RR;** **Total:** 1.01 (0.99, 1.80) **Cardiovascular:** 1.05 (1.02, 1.09) **IHD:** 0.99 (0.93, 1.05) **Cerebrovascular:** 1.04 (0.99, 1.08) **Stroke:** 1.03 (0.98, 1.08)
Turin et al. (2012)	Takashami, Japan (1988-2004)	Cardiovascular Cerebrovascular	24-h avg	16.0	75^{th}: 20.6	Exposure data obtained from the National Institute for Environmental Studies	No single pollutant NO_2 effect estimates.

Study	Location (Years)	Mortality (ICD9/10)	Metric	Mean NO_2 Concentration (ppb)	Upper Percentile Concentrations of NO_2 (ppb)	Exposure Assessment	Selected Effect Estimates (95% CI)[a]
Vichit-Vadakan et al. (2010)	Bangkok, Thailand (1999-2003)	Total Cardiovascular Respiratory	24-h avg	23.8	75^{th}: 29.1 95^{th}: 42.2 Max:74.3	Average of 10 monitors	**Lag 0-4;** **Total:** 6.2% (3.4, 8.5) **Cardiovascular:** 6.9% (0.8, 13.4) **Respiratory:** 5.4% (-2.2, 13.4)
Vidale et al. (2010)	Como, Italy (2000-2003)	Total	24-h avg	---	---	Average of 2 monitors	No NO_2 effect estimates
Wong et al. (2008)	Hong Kong, China (1996-2002)	Cardiovascular Respiratory	24-h avg	31.2	75^{th}: 37.0 Max: 89.4	Average of 8 monitors	**Lag 0;** **Cardiovascular:** 4.5% (2.3, 6.7) **Respiratory:** 3.3% (0.7, 6.1)
Wong et al. (2007)	Hong Kong, China (1998)	Total Cardio-respiratory	24-h avg	29.5	75^{th}: 35.2 Max: 66.8	Exposure data obtained from HK Environmental Protection Department	**Lag NR;** **Age ≥ 30;** **Total:** *Exercise:* 1.1% (-5.4, 8.0) *No Exc.:* 4.4% (-0.4, 9.4) **Cardio-Respiratory:** *Exercise:* 2.5% (-7.0, 12.7) *No Exc.:* 3.5% (-3.7, 11.1)
Wong et al. (2010)	Hong Kong, China (1996-2002)	Total Cardiovascular Respiratory	24-h avg	31.2	75^{th}: 37.0 Max: 89.4	Average of 8 monitors	**Lag 0-1;** **Total:** 3.9% (2.6, 5.2) **Cardiovascular:** 5.3% (2.8, 7.8) **Respiratory:** 5.4% (2.5, 8.3)
Wong et al. (2009)	Hong Kong, China (1996-2002)	Total Cardiovascular Respiratory	24-h avg	31.2	75^{th}: 37.0 Max: 89.4	Average of 8 monitors	**Lag 0-1;** **Respiratory Disease:** 4.7% (1.0, 8.6) **COPD:** 1.0% (-4.9, 7.2) **CVD:** 4.7% (1.6, 8.0)
Yang et al. (In Press)	Guangzhou, China (2007-2008)	Total	24-h avg	26.6	75^{th}: 34.0 Max: 103.2	Exposure data obtained from Guangzhou Environ. Monitoring Center	No NO_2 effect estimates
Zauli Sajani et al. (2011)	Emilia-Romagna, Italy (2002-2006)	Total	24-h avg	Median: 26.6	95^{th}: 41.5	Various averaging strategies of up to 22 monitors	**Lag 1;** **Total:** 2.9% (-1.3, 7.3)
Zhang et al. (2011)	Beijing, China (2003-2008)	Respiratory Cardiovascular	24-h avg	34.5	75^{th}: 41.7 Max:114.0	Average of 11 monitors	**Lag 0;** **Respiratory:** 3.6% (2.9, 4.3) **Cardiovascular:** 1.0% (0.3, 1.7)

[a] When possible effect estimates (Percent Increase unless otherwise specified) were standardized to a 20 ppb increase in 24-h avg NO_2 concentrations, a 40 ppb increase in 24-h avg NO_X concentrations, and a 30 ppb increase in 1-h max NO_2 concentrations.