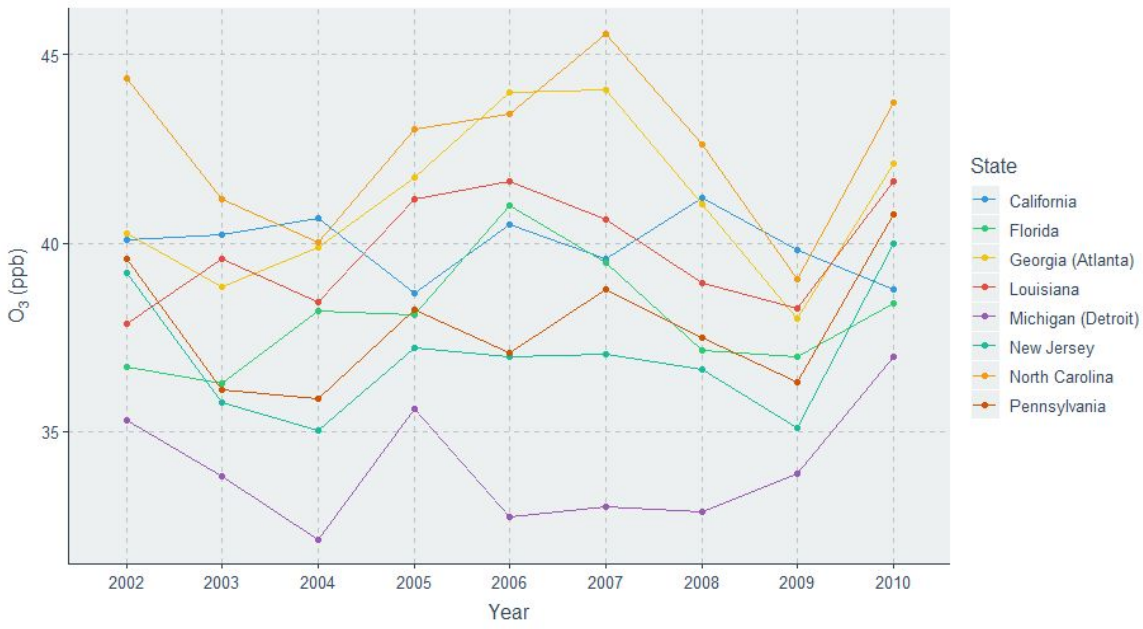


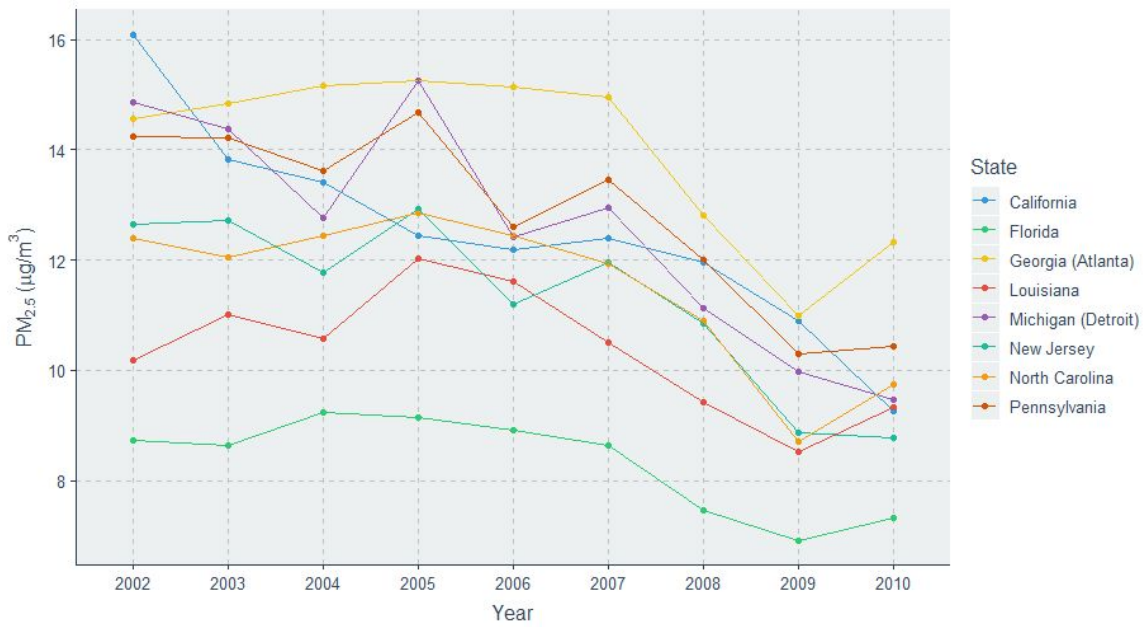
## **ONLINE DATA SUPPLEMENT**

Long-term Exposure to Ozone and Cause-Specific Mortality Risk in the U.S.

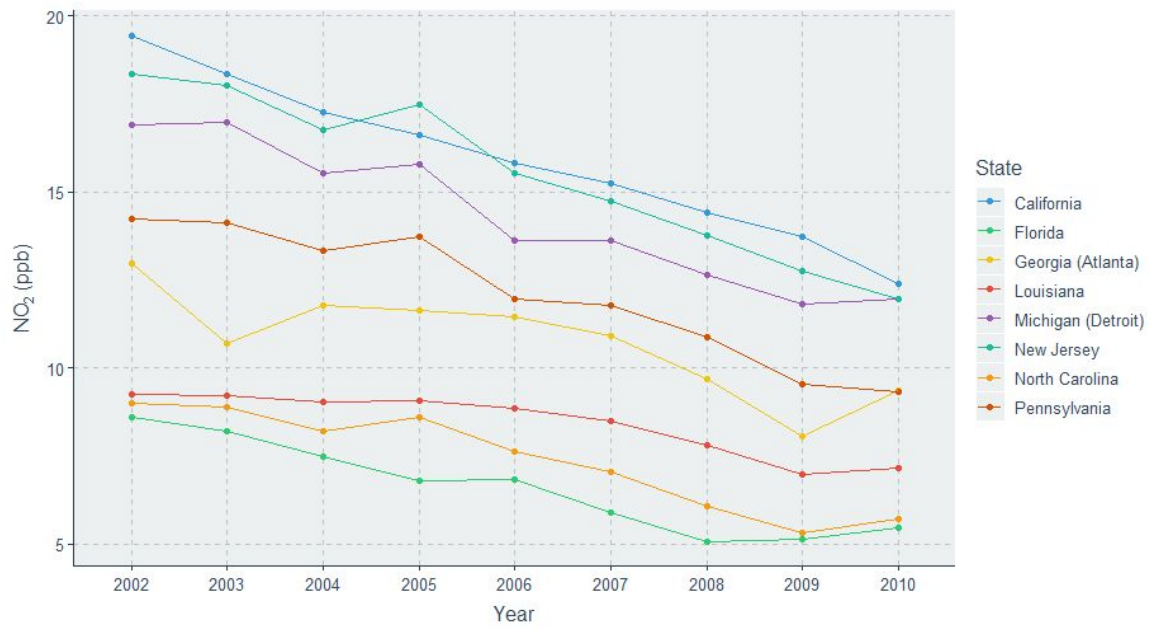
Figure E1. Annual average concentrations of air pollutants by study states (2002-2010)



a) Annual average O<sub>3</sub> concentrations by study states (2002-2010)



b) Annual average PM<sub>2.5</sub> concentrations by study states (2002-2010)



c) Annual average NO<sub>2</sub> concentrations by study states (2002-2010)

Table E1. All-cause and cause-specific mortality HRs associated with O<sub>3</sub> (per 10 ppb), for two-pollutant/exposure models

Cause	Annual O <sub>3</sub> adjusting for PM <sub>2.5</sub>		Warm Season O <sub>3</sub> adjusting for PM <sub>2.5</sub>		Annual O <sub>3</sub> adjusting for NO <sub>2</sub>		Warm Season O <sub>3</sub> adjusting for NO <sub>2</sub>		Annual O <sub>3</sub> adjusting for T <sub>max</sub>		Warm Season O <sub>3</sub> adjusting for T <sub>max</sub>	
	HR*	95% CI*	HR*	95% CI*	HR*	95% CI*	HR*	95% CI*	HR*	95% CI*	HR*	95% CI*
All-cause	0.99	0.97-1.00	0.99	0.98-1.00	0.99	0.98-1.01	1.00	0.99-1.01	0.98	0.96-1.00	0.99	0.97-1.00
Cardiovascular Disease	1.03	1.00-1.05	1.02	1.00-1.04	1.05	1.02-1.07	1.03	1.01-1.05	1.00	0.97-1.02	0.99	0.98-1.02
Ischemic Heart Disease	1.05	1.02-1.08	1.03	1.01-1.06	1.07	1.04-1.11	1.04	1.02-1.07	1.01	0.97-1.05	1.02	1.00-1.05
Cerebrovascular Disease	1.01	0.95-1.07	1.02	0.97-1.06	1.02	0.96-1.08	1.03	0.98-1.07	0.93	0.87-0.99	0.94	0.89-0.99
Cardiac Arrest, Heart Failure	0.99	0.93-1.06	0.99	0.95-1.04	1.00	0.93-1.06	0.99	0.95-1.03	0.99	0.92-1.05	0.97	0.92-1.03
Respiratory Disease	1.04	1.00-1.08	1.04	1.01-1.07	1.05	1.01-1.10	1.05	1.02-1.07	1.03	0.98-1.08	1.04	1.00-1.07
COPD	1.08	1.03-1.14	1.06	1.03-1.10	1.09	1.04-1.15	1.07	1.03-1.10	1.07	1.01-1.13	1.06	1.01-1.11
Pneumonia and Influenza	0.97	0.87-1.08	1.00	0.93-1.08	1.03	0.93-1.14	1.05	0.98-1.12	0.95	0.85-1.07	1.03	0.95-1.14
Lung Cancer	0.96	0.92-1.00	0.98	0.95-1.01	0.96	0.92-1.00	0.97	0.95-1.00	0.95	0.91-0.99	0.96	0.92-0.99

\*Adjusted for age, sex, and location, as strata; for race, BMI, education, smoking, diet, and marital status, at individual-level; and for median income and % with high school education, at census-tract level.

Table E2. All-cause and cause-specific mortality HRs associated with O<sub>3</sub> (per 10 ppb) with time-dependent and time-independent exposures, restricting the follow-up period to 2003-2011

Cause	N	Time-Dependent				Time-Independent			
		Annual O <sub>3</sub>		Warm Season O <sub>3</sub>		Annual O <sub>3</sub>		Warm Season O <sub>3</sub>	
		HR*	95% CI*	HR*	95% CI*	HR*	95% CI*	HR*	95% CI*
All-cause	86566	0.98	0.96-1.00	0.99	0.98-1.00	0.99	0.97-1.01	0.99	0.99-1.01
Cardiovascular Disease	26764	1.02	0.99-1.05	1.02	1.00-1.04	1.04	1.01-1.07	1.03	1.01-1.05
Ischemic Heart Disease	14629	1.07	1.03-1.11	1.05	1.03-1.08	1.08	1.04-1.13	1.06	1.04-1.09
Cerebrovascular Disease	4085	0.98	0.92-1.06	1.01	0.96-1.06	1.01	0.94-1.09	1.02	0.97-1.07
Cardiac Arrest, Heart Failure	4788	0.97	0.90-1.04	0.98	0.93-1.03	0.97	0.90-1.05	0.98	0.93-1.03
Respiratory Disease	9332	1.01	0.96-1.06	1.03	0.99-1.06	1.04	0.99-1.09	1.04	1.01-1.08
COPD	5712	1.06	1.00-1.12	1.06	1.01-1.10	1.09	1.03-1.16	1.07	1.03-1.12
Pneumonia and Influenza	1460	0.99	0.89-1.12	1.04	0.96-1.13	0.99	0.89-1.12	1.04	0.96-1.13
Lung Cancer	8560	0.97	0.92-1.02	0.98	0.94-1.01	0.98	0.93-1.03	0.98	0.94-1.01

\*Adjusted for age (as time-varying for the time-dependent model), sex, and location, as strata; for race, BMI, education, smoking, diet, and marital status, at individual-level; and for median income and % with high school education, at census-tract level.

Table E3. All-cause and cause-specific mortality HRs associated with O<sub>3</sub> (per 10 ppb), by study location region

Cause	N	California (n= 170,774)				N	North (n= 179,578)				N	South (n=198,418)			
		Annual O <sub>3</sub>		Warm Season O <sub>3</sub>			Annual O <sub>3</sub>		Warm Season O <sub>3</sub>			Annual O <sub>3</sub>		Warm Season O <sub>3</sub>	
		HR*	95% CI*	HR*	95% CI*		HR*	95% CI*	HR*	95% CI*		HR*	95% CI*	HR*	95% CI*
All-cause	37437	0.99	0.97-1.00	1.00	0.99-1.01	41971	0.99	0.94-1.03	1.02	0.97-1.06	47398	0.98	0.94-1.02	0.99	0.97-1.03
Cardiovascular Disease	11616	1.05	1.02-1.08	1.04	1.02-1.06	13247	0.94	0.87-1.02	0.97	0.89-1.05	14666	1.01	0.93-1.09	0.99	0.94-1.03
Ischemic Heart Disease	6621	1.08	1.04-1.12	1.06	1.04-1.09	7492	0.99	0.89-1.10	1.02	0.92-1.14	8214	0.98	0.88-1.09	0.96	0.91-1.02
Cerebrovascular Disease	1769	1.01	0.94-1.08	1.02	0.97-1.06	1716	0.87	0.69-1.09	1.06	0.84-1.34	2107	1.05	0.85-1.29	1.02	0.89-1.15
Cardiac Arrest, Heart Failure	1681	0.99	0.92-1.06	1.00	0.95-1.05	2570	1.06	0.88-1.28	0.94	0.78-1.14	2560	0.90	0.74-1.09	0.92	0.82-1.04
Respiratory Disease	3925	1.02	0.97-1.07	1.02	0.99-1.05	3706	1.07	0.92-1.25	1.16	0.99-1.36	4828	1.17	1.02-1.34	1.18	1.08-1.28
COPD	2515	1.06	1.00-1.13	1.04	0.99-1.08	2169	1.13	0.92-1.38	1.25	1.02-1.53	3064	1.19	1.01-1.42	1.18	1.07-1.31
Pneumonia and Influenza	695	1.02	0.92-1.14	1.06	0.98-1.14	550	0.69	0.46-1.03	0.68	0.45-1.01	644	1.05	0.72-1.54	1.11	0.88-1.40
Lung Cancer	3871	0.97	0.92-1.01	0.97	0.94-1.01	4287	0.97	0.85-1.12	1.02	0.88-1.17	5371	0.91	0.80-1.03	0.95	0.88-1.02

\*Adjusted for age, sex, and location, as strata; for race, BMI, education, smoking, diet, and marital status, at individual-level; and for median income and % with high school education, at census-tract level.