Table S1. Mortality Rate Ratios[a] (95% confidence intervals) Adjusted Behavioral Covariates

$PM_{2.5}$ Measure	Base Model			BRFSS Adjusted Model[d]		
	Total[b]	Spatio-temporal[c]	Temporal[c]	Total[d]	Spatio-temporal[e]	Temporal[e]
$PM_{2.5}$	1.187 (1.181,1.193)	1.074 (1.061,1.088)	1.540 (1.522,1.559)	1.190 (1.184,1.197)	1.077 (1.064,1.091)	1.517 (1.498,1.537)
Time-Adjusted $PM_{2.5}$[f]	1.099 (1.092,1.106)	--	--	1.122 (1.115,1.129)	--	--

Abbreviation: BRFSS, the Behavioral Risk Factor Surveillance System

[a]Nationwide BRFSS-adjusted MRRs estimated for subset of population living near monitors located in counties with BRFSS data (465 monitoring sites) during 2000-2012; all MRRs expressed per 10 $\mu g/m^3$ increase in exposures during the previous year

[b]Adjusted for age and regions; all $p<0.001$

[c]Adjusted for age, regions, and spatio-temporal or temporal component; all $p<0.001$

[d]Adjusted for age, regions, county and yearly level information from the BRFSS-SMART data including the proportion of non-whites, current smokers, diabetes, asthma, and individual possessing health care plan, and the mean income and body mass index; all $p<0.001$

[e]Adjusted for age, regions, spatio-temporal or temporal component, and county and yearly level information from the BRFSS-SMART data including the proportion of non-whites, current smokers, diabetes, asthma, and individual possessing health care plan, and the mean income and body mass index; all $p<0.001$

[f] Models adjusted for long-term time trends in $PM_{2.5}$ using the residual-based approach.

Table S2. MRRs (95% confidence intervals) per IQR increase in 1-Year Moving Average $PM_{2.5}$[a] for Base and Time-Adjusted Models: 2000-2012.

Region	Monitors	Base Model[b]	Time-Adjusted Models		
			Residual[c]	Penalized Spline[d]	Decomposition[e]
U.S.	798	1.08 (1.08,1.08)	1.04 (1.04,1.04)	1.01 (1.01,1.02)	1.03 (1.02,1.03)
West	93	1.06 (1.06,1.06)	1.03 (1.02,1.03)	0.95 (0.94, 0.95)	1.00 (1.00,1.00)
Center	195	1.08 (1.07,1.08)	1.05 (1.05,1.06)	1.05 (1.04, 1.05)	1.05 (1.05, 1.06)
East	510	1.09 (1.09,1.09)	1.04 (1.04,1.04)	1.05 (1.05,1.05)	1.04 (1.04,1.04)

[a]Exposures estimated as the 1-year moving average $PM_{2.5}$ exposures for all models except for the residual-based time-adjusted model; exposures for the residual-based model estimated as the 1-year moving average of the residuals of $PM_{2.5}$ regressed on year in 4-year intervals

[b]Log-linear models adjusted for age and regions; all $p<0.001$

[c]Model adjusted for long-term time trends in $PM_{2.5}$ using a new exposure measure based on the residuals of $PM_{2.5}$ regressed on year in 4-year intervals

[d]Model adjusted for long-term time trends in $PM_{2.5}$ by adding a penalized spline term for time to the base model

[e]Model adjusted for long-term time trends in $PM_{2.5}$ by adding a term that describes only temporal variation in $PM_{2.5}$, which was calculated by decomposing $PM_{2.5}$ into its temporal and spatio-temporal components following Greven et al. [16]

Note: IQRs of the $PM_{2.5}$ for US, West, Center, and East regions were 4.149, 5.461, 3.126, and 3.773 $\mu g/m^3$, respectively; IQRs of the residual for US, West, Center, and East regions were 3.574, 5.673, 2.952, and 2.812 $\mu g/m^3$, respectively.

Figure S1. MRRs per a 10 μg/m^3 increase in $PM_{2.5}$ for varying study period lengths: By geographical regions

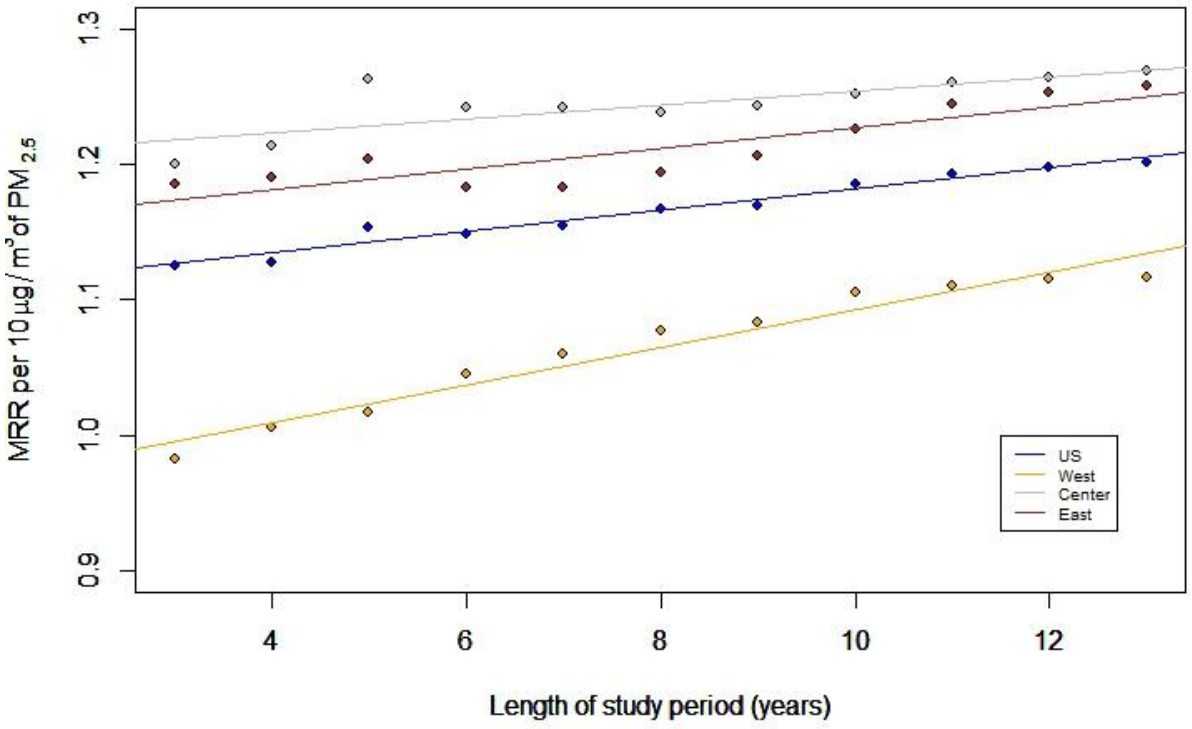

Figure S2. MRRs per a 10 μg/m^3 increase in $PM_{2.5}$ for varying study period lengths using residual-based models with 4-year interval: By geographic regions

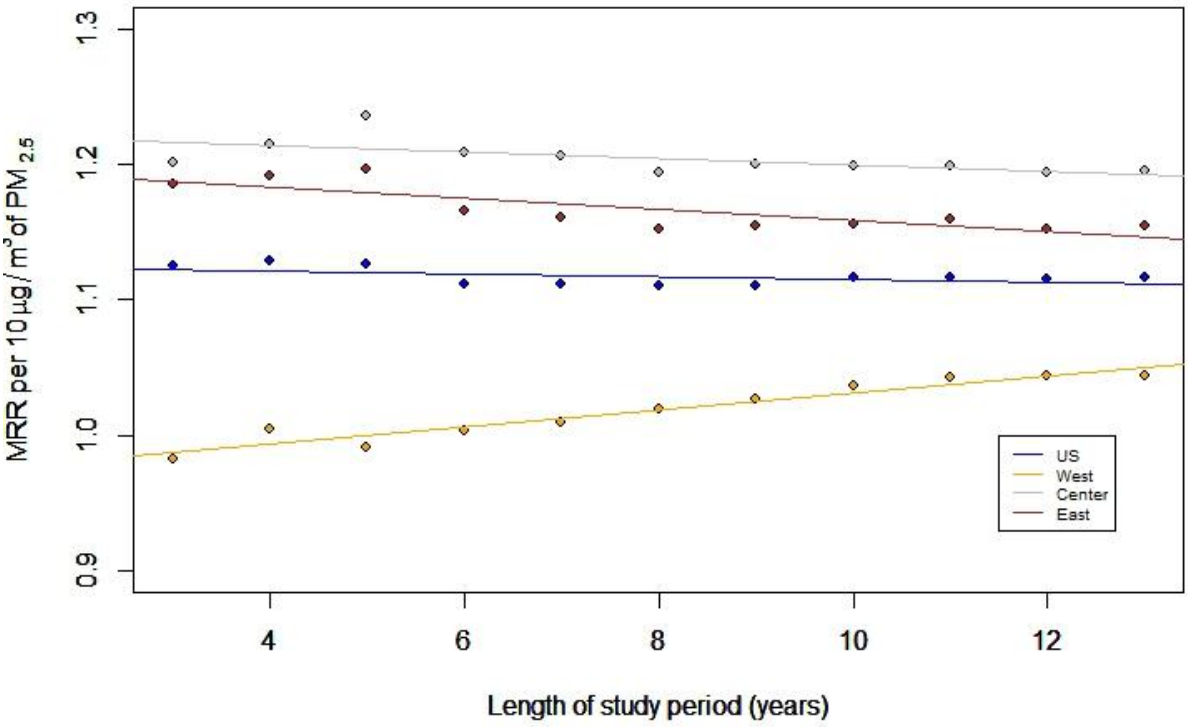

Figure S3. MRRs per a 10 μg/m^3 increase in $PM_{2.5}$ for varying study period lengths using spline-based models: By geographic regions

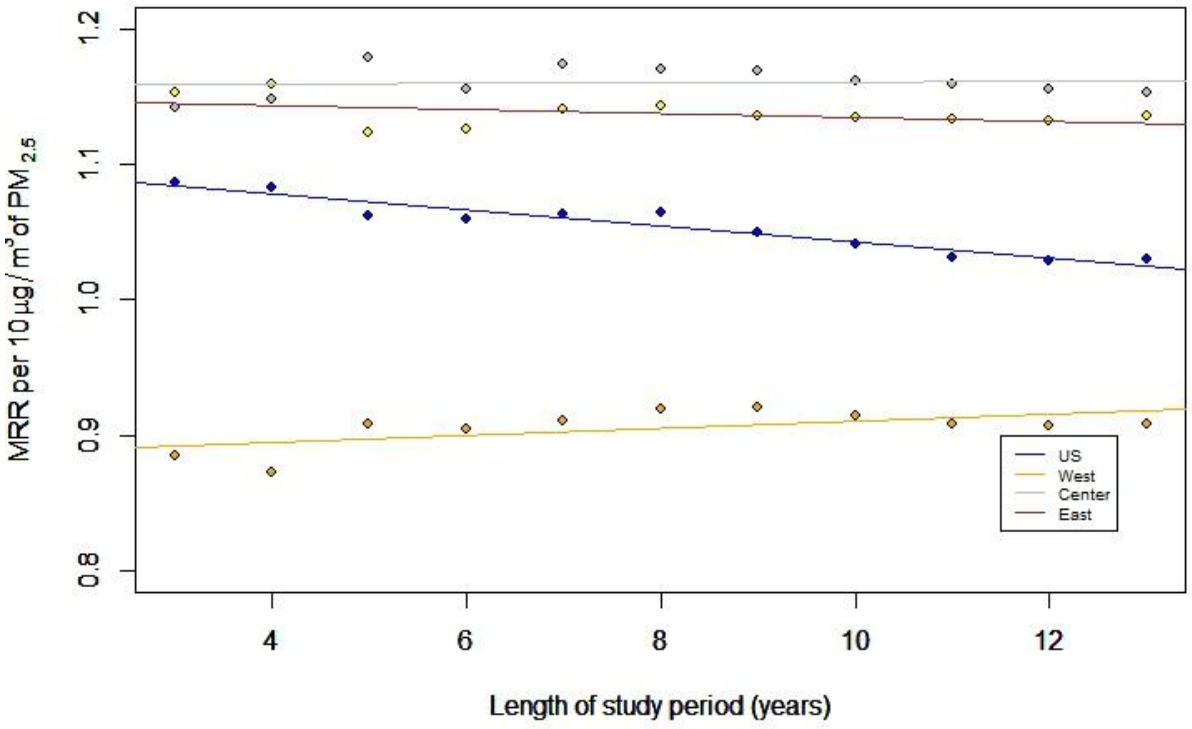

Figure S4. MRRs per a 10 μg/m^3 increase in $PM_{2.5}$ for varying study period lengths using the decomposition-based model: By geographic regions