

## Supplementary Material

### Mortality data

The study classified 12 specific causes of death according to the International Statistical Classification of Disease, 10<sup>th</sup> Revision (ICD-10; World Health Organization 2007), including non-accidental mortality (A00–R99), cardiovascular disease (CCVD, I00–I99), ischemic heart disease (IHD, I20–I25), acute ischemic heart disease (AIHD, I20–I22, I24), acute myocardial infarction (AMI, I21–I22), cerebrovascular disease (CVD, I60–I69), stroke (I60–I64), hemorrhagic stroke (I60–I61), intracranial hemorrhagic stroke (ICH-Stroke, I61), respiratory diseases (RD, J00–J99), chronic lower respiratory disease (CLRD, J40–J47) and chronic obstructive pulmonary disease (COPD, J41–J44).

### PM<sub>2.5</sub> Exposure Assessment

PM<sub>2.5</sub> concentrations from the monitoring station located within each study area was assigned as the exposure for each county. If multiple air monitors were available for a county, the concentrations were averaged. If no monitoring stations are located within a county, then one station with the closest spatial distance to the county center is assigned as the exposure for that county.

### Sensitivity Analyses

The report displays two aspects of sensitivity analyses on non-accidental mortality (Table S1) with respect to (1) alternative degrees of freedom in the smooth functions of time ( $df = 7, 8$ ) and meteorological factors ( $df = 5$ ); (2) using different subsets of study sites with study periods of only 6-year, both 5- and 6-year, and containing 4-, 5- and 6-year to observe model stability. summarizes the estimates of PM<sub>2.5</sub> with alternative values for degrees of freedom for time trends and meteorological indicators, which suggests that our results were relatively robust from this respect. We also compared the results across different subsets composed of different years, which showed the estimated value of 4-, 5- and 6-year sub-data did not change much, while values of 5- and 6-year, and 6-year only sub-data tended to decrease.

TABLE S1. Summary estimates (95% CIs) of sensitivity analysis.

Items	No. of counties	% increase (95%CI)
<b>The Main Analysis</b>		
$df_{time}=6, df_{temperature}=3, df_{humidity}=3$	130	0.14 (0.06, 0.21)
<b>Alternative Degrees of Freedom</b>		
$df_{time}=7, df_{temperature}=3, df_{humidity}=3$	130	0.14 (0.06, 0.21)
$df_{time}=8, df_{temperature}=3, df_{humidity}=3$	130	0.17 (0.09, 0.25)
$df_{time}=6, df_{temperature}=5, df_{humidity}=5$	130	0.15 (0.07, 0.22)
$df_{time}=7, df_{temperature}=3, df_{humidity}=5$	130	0.15 (0.07, 0.22)
$df_{time}=8, df_{temperature}=3, df_{humidity}=5$	130	0.18 (0.11, 0.26)
<b>Different Period Subsets</b>		
only 6-year dataset	42	0.09 (-0.02, 0.19)
6- and 5-year dataset	89	0.10 (0.02, 0.18)
6-, 5- and 4-year dataset	128	0.13 (0.06, 0.21)

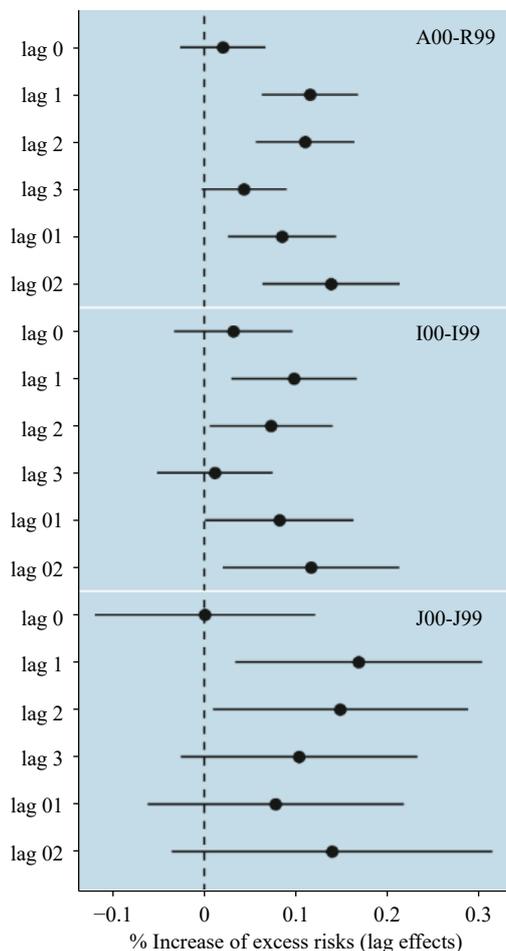


FIGURE S1. Percent increase of non-accidental (A00-R99), cardio-cerebrovascular (I00-I99) and respiratory (J00-J99) mortality per 10 µg/m<sup>3</sup> increase in PM<sub>2.5</sub> lag effects.

(error bars represent 95% CIs of the estimates)