

**Table S1. Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Nonsmokers.**

PM Levels	COPD		COPD Symptoms		Other Pulmonary Diseases	
	N=175		N=618		N=363	
	Adjust OR*	95%CI#	Adjust OR	95%CI	Adjust OR	95%CI
<b>PM<sub>2.5</sub></b>						
<=35µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=75µg/m <sup>3</sup>	1.864	0.903,3.846	1.511	1.103,2.070	1.875	1.145,3.070
>75µg/m <sup>3</sup>	2.134	0.770,5.914	1.370	0.860,2.184	2.250	1.194,4.240
<b>PM<sub>10</sub></b>						
<=50µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=150µg/m <sup>3</sup>	1.864	0.903,3.846	1.511	1.103,2.070	1.970	1.208,3.213

**Table S1 Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Nonsmokers.** \*OR=Odds Ratio of daily mean PM<sub>2.5/10</sub> concentration for COPD, COPD symptoms, other chronic pulmonary diseases, and all models are adjusted for age group, sex, personal education state, family history, biofuel and occupational exposure, history of childhood pneumonia in the hospital, mother smoking during pregnancy, maternal exposure to second-hand smoking during pregnancy, kitchen ventilation quality, second-hand smoking exposure, rural/ urban distribution and clusters; #CI= confidence interval; † PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 µm; Calculation was based on all nonsmokers (n = 3954) in the 7 clusters.

**Table S2. Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Females.**

PM Levels	COPD		COPD Symptoms		Other Pulmonary Diseases	
	N=124		N=458		N=264	
	Adjust OR*	95%CI#	Adjust OR	95%CI	Adjust OR	95%CI
<b>PM<sub>2.5</sub></b>						
<=35µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=75µg/m <sup>3</sup>	1.635	0.647,4.134	1.717	1.186,2.486	1.604	0.873,2.947
>75µg/m <sup>3</sup>	1.733	0.497,6.041	1.381	0.820,2.324	1.606	0.743,3.469
<b>PM<sub>10</sub></b>						
<=50µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=150µg/m <sup>3</sup>	1.635	0.647,4.134	1.717	1.186,2.486	1.747	0.959,3.185

**Table S2 Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Females.** \*OR=Odds Ratio of daily mean PM<sub>2.5/10</sub> concentration for COPD, COPD symptoms, other chronic pulmonary diseases, and all models are adjusted for age group, personal education state, smoking history, family history, biofuel and occupational exposure, history of childhood pneumonia in the hospital, mother smoking during pregnancy, maternal exposure to second-hand smoking during pregnancy, kitchen ventilation quality, second-hand smoking exposure, rural/ urban distribution and clusters; #CI= confidence interval; † PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 µm; Calculation was based on all female participants (n = 3034) in the 7 clusters.

**Table S3. Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Males.**

PM Levels	COPD N=397		COPD Symptoms N=825		Other Pulmonary Diseases N=432	
	Adjust OR*	95%CI#	Adjust OR	95%CI	Adjust OR	95%CI
	<b>PM<sub>2.5</sub></b>					
<=35µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=75µg/m <sup>3</sup>	3.339	1.671,6.671	1.195	0.841,1.699	1.961	1.170,3.287
>75µg/m <sup>3</sup>	3.156	1.368,7.280	1.242	0.730,2.113	2.135	1.109,4.113
<b>PM<sub>10</sub></b>						
<=50µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=150µg/m <sup>3</sup>	3.253	1.628,6.497	1.191	0.838,1.693	1.997	1.190,3.350

**Table S3 Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Males.** \*OR=Odds Ratio of daily mean PM<sub>2.5/10</sub> concentration for COPD, COPD symptoms, other chronic pulmonary diseases, and all models are adjusted for age group, personal education state, smoking history, family history, biofuel and occupational exposure, history of childhood pneumonia in the hospital, mother smoking during pregnancy, maternal exposure to second-hand smoking during pregnancy, kitchen ventilation quality, second-hand smoking exposure, rural/urban distribution and clusters; #CI= confidence interval; † PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 µm; Calculation was based on all female participants (n = 2959) in the 7 clusters.

**Table S4. Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Smokers.**

PM Levels	COPD N=346		COPD Symptoms N=665		Other Pulmonary Diseases N=333	
	Adjust OR*	95%CI#	Adjust OR	95%CI	Adjust OR	95%CI
	<b>PM<sub>2.5</sub></b>					
<=35µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=75µg/m <sup>3</sup>	3.339	1.671,6.671	1.195	0.841,1.699	1.837	0.914,3.694
>75µg/m <sup>3</sup>	3.156	1.368,7.280	1.242	0.730,2.113	1.394	0.595,3.265
<b>PM<sub>10</sub></b>						
<=50µg/m <sup>3</sup>	1	reference	1	reference	1	reference
<=150µg/m <sup>3</sup>	3.253	1.628,6.497	1.191	0.838,1.693	1.847	0.918,3.716

**Table S4 Ambient Air Particulate Matter Levels and Hazards for COPD and Other Pulmonary Outcomes in Smokers.** \*OR=Odds Ratio of daily mean PM<sub>2.5/10</sub> concentration for COPD, COPD symptoms, other chronic pulmonary diseases, and all models are adjusted for sex, age group, personal education state, family history, biofuel and occupational exposure, history of childhood pneumonia in the hospital, mother smoking during pregnancy, maternal exposure to second-hand smoking during pregnancy, kitchen ventilation quality, second-hand smoking exposure, rural/urban distribution and clusters; #CI= confidence interval; † PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 µm; Calculation was based on all smok participants (n = 2039) in the 7 clusters.

**Table S5 The Correlation Between PM Concentration and Prevalence Rate of Sex.**

PM	Total		Male		Female	
	r	P	r	P	r	P
PM <sub>2.5</sub>	0.228	0.623	0.286	0.534	-0.451	0.309
PM <sub>10</sub>	0.121	0.797	0.173	0.71	-0.405	0.367

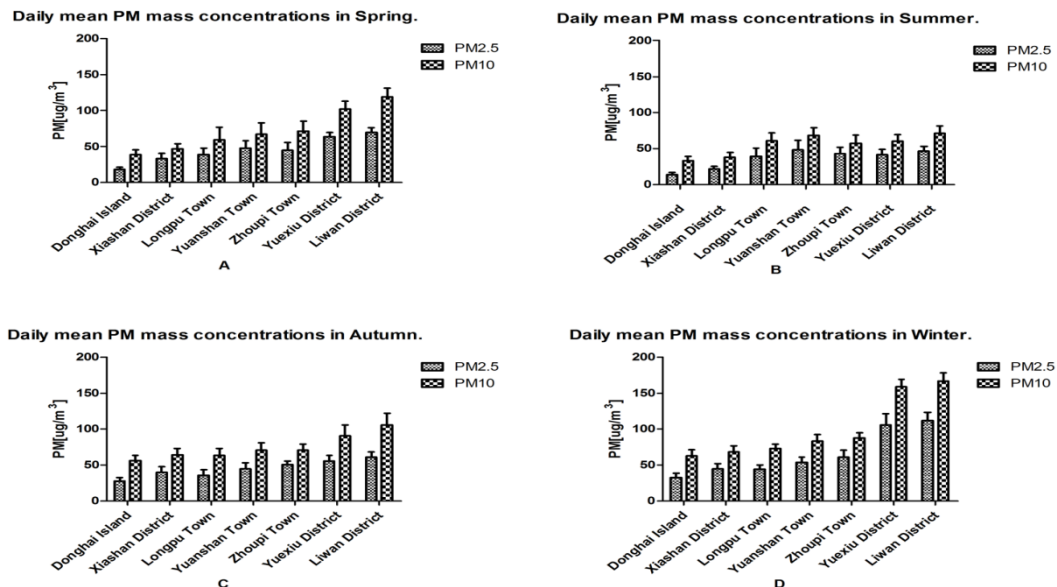
**Table S5 The Correlation Between PM concentration and Prevalence of Sex.** PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 μm; r= correlation coefficient.

**Table S6 Ambient Air Particulate Matter Exposure and Effects on Lung Function in Patients with COPD.**

Lung Function Outcome	Daily mean PM <sub>2.5</sub> concentration(10μg/m <sup>3</sup> )			Daily mean PM <sub>10</sub> concentration(10μg/m <sup>3</sup> )		
	B	95% C.I.	P	B	95% C.I.	P
FEV1(ml)	11	(-50,71)	0.725	4	(-39,46)	0.867
FVC(ml)	-24	(-111,62)	0.582	-14	(-64,36)	0.582
FEV1%pred(%)	0.663	(-2.257,3.584)	0.656	0.385	(-1.311,2.082)	0.656
FVC%pred(%)	-0.467	(-3.113,2.178)	0.729	-0.271	(-1.808,1.265)	0.729
FEV1/FVC(%)	0.808	(-0.500,2.116)	0.226	0.469	(-0.291,1.229)	0.226

**Table S6 Ambient Air Particulate Matter Exposure and Effects on Lung Function in Patients with COPD.** PM<sub>2.5/10</sub>= particle matter with a median aerodynamic diameter < 2.5 /10 μm; r= correlation coefficient. All lung function outcome are used data of post-bronchodilators. Calculation was based on all COPD patients (n = 521) in the 7 clusters.

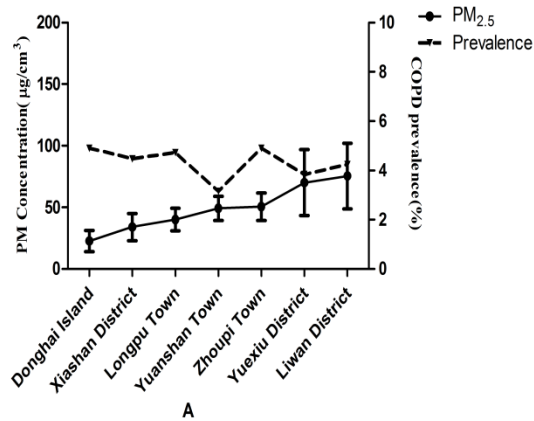
FigureS1



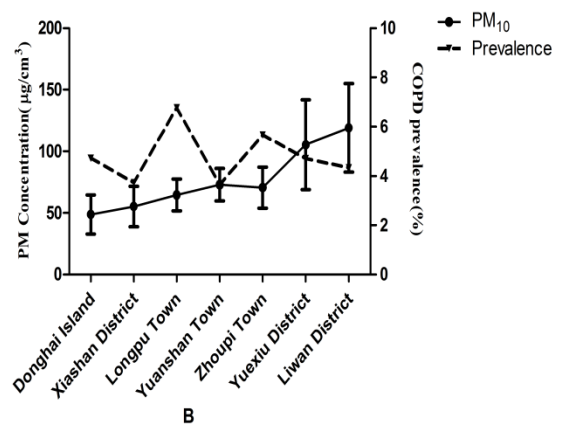
**Figure S1 Daily mean PM mass concentrations in four seasons.** The seasonal mean  $PM_{2.5/10}$  mass concentrations were calculated using samples collected in April, July, and October 2014 and January 2015 from the 7 centers. Values are shown as mean and SD  $PM_{2.5/10}$ = particle matter with a median aerodynamic diameter  $< 2.5 /10 \mu m$ .

Figure S2

FigureS1 A The year-round daily mean  $PM_{2.5}$  concentration and COPD prevalence of Females in the 7 clusters



FigureS1 B The year-round daily mean  $PM_{10}$  concentration and COPD prevalence of Nonsmokers in the 7 clusters



**Figure S2 Year-round daily mean  $PM_{2.5/10}$  concentrations and COPD prevalence in nonsmokers and females.** Year-round daily mean  $PM_{2.5/10}$  concentrations were calculated using all the data collected from April 2014 to January 2015 at the 7 centers. Values are shown as mean and SD  $PM_{2.5/10}$ = particle matter with a median aerodynamic diameter  $< 2.5 /10 \mu m$ .