

Supplementary Figure S1. Annual average PM_{2.5} concentration from 2012–2016.

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Supplementary Figure S2. Proportion of dementia and cognitive impairment in $PM_{2.5}$ and smoking subgroups. The x axis shows $PM_{2.5}$ or smoking groups, and then y axis shows the proportion in percentage. (A) Proportion of dementia in $PM_{2.5}$ groups. (B) Proportion of cognitive impairment in $PM_{2.5}$ groups. (C) Proportion of dementia in smoking groups. (D) Proportion of cognitive impairment in smoking groups. P < 0.05 of logistic regression in A to D.



Supplementary Figure S3. Sex subgroup analysis of joint effects of PM_{2.5} and smoking on cognitive impairment. The adjusted covariates included sample weight, age group, location, educational level, marital status, occupation, living status, socialization with neighbors, social activities, alcohol consumption, regular exercise, activities of daily living, Parkinson's symptoms, and BMI.



Supplementary Figure S4. Age subgroup analysis of joint effects of PM_{2.5} and smoking on cognitive impairment. The adjusted covariates included sample weight, sex, location, educational level, marital status, occupation, living status, socialization with neighbors, social activity, alcohol consumption, regular exercise, activities of daily living, Parkinson's symptoms, and BMI.

Chanastaristica	Tot	al		Norr	nal	Abnormal		
Characteristics	N	%	<i>p</i> -value	Ν	%	Ν	%	
Location			0.0020					
Urban	12,950	53.7		12,594	53.9	356	48.1	
Rural	11,167	46.3		10,783	46.1	384	51.9	
Age group (years)			< 0.0001					
60-	12,379	51.3		12,177	52.1	202	27.3	
70–	8,715	36.1		8,397	35.9	318	43.0	
≥ 80	3,023	12.5		2,803	12.0	220	29.7	
Sex			< 0.0001					
Male	10,722	44.5		10,502	44.9	220	29.7	
Female	13,395	55.5		12,875	55.1	520	70.3	
Total	24,117	100.0		23,377	100.0	740	100.0	

Supplementary Table S1. Baseline characteristics of those in the different cognitive function groups

Variables —		N	1ale		Female					
	OR	95% CI		P-value	OR	95% CI		P-value		
PM _{2.5}				< 0.0001				< 0.0001		
T1	ref				ref					
Т2	3.873	3.859	3.887		4.718	4.702	4.735			
ТЗ	0.664	0.661	0.667		1.227	1.222	1.232			
Smoking				< 0.0001				< 0.0001		
None	ref				ref					
Occasional	1.574	1.568	1.579		0.115	0.111	0.119			
Daily	1.058	1.056	1.061		0.272	0.269	0.275			

Supplementary Table S2. Sex subgroup analysis of association of PM_{2.5} and smoking with short-term cognitive impairment

Note. Adjusted covariates included sample weight, age group, location, educational level, marital status, occupation, living status, socializing with neighbors, social activities, alcohol consumption, regular exercise, activities of daily living, Parkinson's symptoms, BMI, and smoking//PM_{2.5}. T1, low; T2, medium; T3, high; *CI*, confidence interval; *OR*, odds ratio; BMI, body mass index.

Supplementary Table S3. Age subgroup analysis of association of PM_{2.5} and smoking with short-term cognitive impairment

Variables -	60–70			70–80				≥ 80				
	OR	95% Cl		P-value	OR	95% CI		P-value	OR	95% CI		P-value
PM _{2.5}		•		< 0.0001				< 0.0001				< 0.0001
T1												
T2	4.386	4.372	4.400		4.448	4.428	4.469		3.993	3.960	4.025	
Т3	0.948	0.944	0.952		0.911	0.906	0.916		1.071	1.062	1.080	
Smoking				< 0.0001				< 0.0001				< 0.0001
None												
Occasional	1.691	1.684	1.698		1.167	1.159	1.174		1.240	1.226	1.254	
Daily	0.963	0.961	0.966		0.940	0.937	0.944		0.979	0.972	0.986	

Note. Adjusted covariates included sample weight, sex, location, educational level, marital status, occupation, living status, socializing with neighbors, social activities, alcohol consumption, regular exercise, activities of daily living, Parkinson's symptom, BMI, and smoking//PM_{2.5}. T1, low; T2, medium; T3, high; *Cl*, confidence interval; *OR*, odds ratio; BMI, body mass index.