Supplemental material

Long-term exposure to ambient $PM_{2.5}$ and increased risk of chronic kidney disease prevalence in China

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Supplemental Figure 3. Exposure-response curves of 1-year mean $PM_{2.5}$ exposure with the prevalence of chronic kidney disease and albuminuria in China between 2007 and 2010 Note: (A) Chronic kidney disease (B) Albuminuria

Supplemental Table 1. The percentage of study participants in each $PM_{2.5}$ level in China between 2007 and 2010.

	$PM_{2.5}$ concentration percentage (2-year mean)					
	0%-10%	11%-25%	26%-50%	51%-75%	76%-90%	91%-100%
$PM_{2.5}$ concentration range ($\mu g/m^3$)	31.3-36.3	36.4-45.5	45.6-57.4	57.5-69.6	69.7-78.1	78.2-87.5
Percentage of study participants	11.7%	15.2%	23.2%	25.6%	14.6%	9.6%

Note: $PM_{2.5}$ exposure level was calculated as the 2-year mean concentration.

Supplemental Table 2. Within-city effects and between-city effects of ambient $PM_{2.5}$ exposure with CKD and albuminuria in China between 2007 and 2010.

Effects	CKD			albuminuria		
	N	OR (95%CI)	*p*-value	N	OR (95%CI)	*p*-value
Within-city Effect[a]	47,204	1.28(1.22, 1.35)	<0.001	47,204	1.39(1.32, 1.47)	<0.001
Between-city Effect[a]	47,024	0.51(0.18, 1.46)	0.212	47,204	0.57(0.18, 1.83)	0.347
Within-city Effect[b]	47,024	1.30(1.23, 1.36)	<0.001	47,024	1.41(1.33, 1.49)	<0.001
Between-city Effect[b]	47,024	0.41(0.14, 1.18)	0.097	47,024	0.40(0.13, 1.29)	0.126

Abbreviation: CKD, chronic kidney disease.

[a] Model 1: Age, gender, education, family income, rural/urban area were adjusted in the model.

[b] Model 2: model 1 plus health-related factors including body mass index, smoking, alcohol consumption, history of cardiovascular diseases, status of diabetes mellitus and hypertension, and nephrotoxic medications were adjusted in the model.

Note: $PM_{2.5}$ exposure level was calculated as the 2-year mean concentration.

Supplemental Table 3. Estimated effects of an increase of 10 μg/m^3 in 2-year mean $PM_{2.5}$ exposure on CKD and albuminuria in China between 2007 and 2010 when controlling for different potential confounders.

Models	CKD			Albuminuria		
	N	OR (95% CI)	*p*-value	N	OR (95% CI)	*p*-value
Model 1[a]	47,204	1.28 (1.22, 1.35)	<0.001	47,204	1.39 (1.32, 1.47)	<0.001
Model 2[b]	47,204	1.29 (1.23, 1.26)	<0.001	47,204	1.40 (1.32, 1.48)	<0.001
Model 3[c]	47,204	1.30 (1.24, 1.37)	<0.001	47,204	1.41(1.33, 1.49)	<0.001

Abbreviation: CKD, chronic kidney disease.

[a] Model 1: Age, gender, education, family income, and urban/rural area were adjusted in the model.

[b] Model 2: Model 1 plus health-related factors, including body mass index, smoking history, alcohol consumption, history of cardiovascular disease, diabetes mellitus and hypertension, and nephrotoxic medications, were adjusted in the model.

[c] Model 3: Model 2 plus medical insurance status (yes or no), were adjusted in the model.

Supplemental Table 4. Estimated effects of an increase of 10 μg/m^3 increase in 1-year mean $PM_{2.5}$ exposure on CKD and albuminuria in China between 2007 and 2010.

Models	CKD			Albuminuria		
	N	OR (95%CI)	*p*-value	N	OR (95%CI)	*p*-value
Model 1[a]	47,204	1.26(1.21, 1.32)	<0.001	47,204	1.36(1.30, 1.44)	<0.001
Model 2[b]	47,204	1.28(1.22, 1.34)	<0.001	47,204	1.37(1.30, 1.45)	<0.001

Abbreviation: CKD, chronic kidney disease.

[a] Model 1: Age, education, family income, urban/rural area were adjusted in the model.

[b] Model 2: model 1 plus health-related factors including body mass index, smoking, alcohol consumption, history of cardiovascular diseases, status of diabetes and hypertension were adjusted in the model.

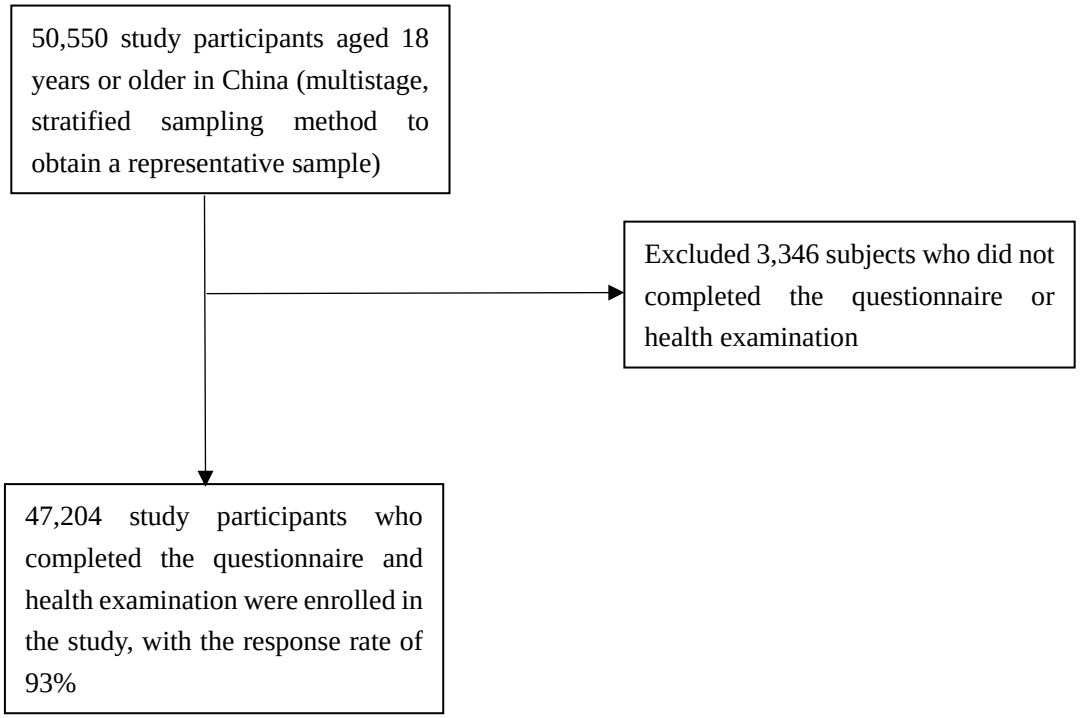
Supplemental Table 5. The associations between 1-year mean $PM_{2.5}$ exposure on CKD and albuminuria in participants with different characteristics in China between 2007 and 2010.

Stratified characteristic	Number of eligible participants	CKD		Albuminuria	
		OR (95% CI)	Interaction *P*-value	OR (95% CI)	Interaction *P*-value
Region					
Urban	25,345	1.26 (1.21, 1.33)	0.004	1.35 (1.29, 1.43)	0.003
Rural	21,859	1.19 (1.10, 1.29)		1.27 (1.16, 1.38)	
Gender					
Male	20,148	1.32 (1.25, 1.39)	0.003	1.43 (1.35, 1.51)	0.001
Female	27,056	1.25 (1.19, 1.31)		1.34 (1.27, 1.41)	
Age					
≥65 years	7,915	1.17 (1.11, 1.24)	<0.001	1.24 (1.17, 1.33)	<0.001
<65 years	39,289	1.31 (1.25, 1.38)		1.42 (1.34, 1.49)	
BMI					
≥25 kg/m^2	16,453	1.27 (1.20, 1.33)	0.389	1.37 (1.29, 1.44)	0.628
<25 kg/m^2	30,418	1.28 (1.22, 1.35)		1.38 (1.31, 1.46)	
Smoking					
Non-current smoker	36,110	1.31 (1.24, 1.39)	0.098	1.36 (1.29, 1.44)	0.149
Current smoker	11,094	1.27 (1.21, 1.33)		1.41 (1.32, 1.50)	
Diabetes mellitus					
No	43,671	1.29 (1.23, 1.36)	0.002	1.41 (1.33, 1.49)	0.069
Yes	3,488	1.19 (1.11, 1.27)		1.33 (1.24, 1.44)	
Hypertension					
No	30,357	1.28 (1.22, 1.34)	0.068	1.40 (1.32, 1.47)	0.037
Yes	16,604	1.23 (1.16, 1.31)		1.34 (1.27, 1.42)	
History of cardiovascular disease					

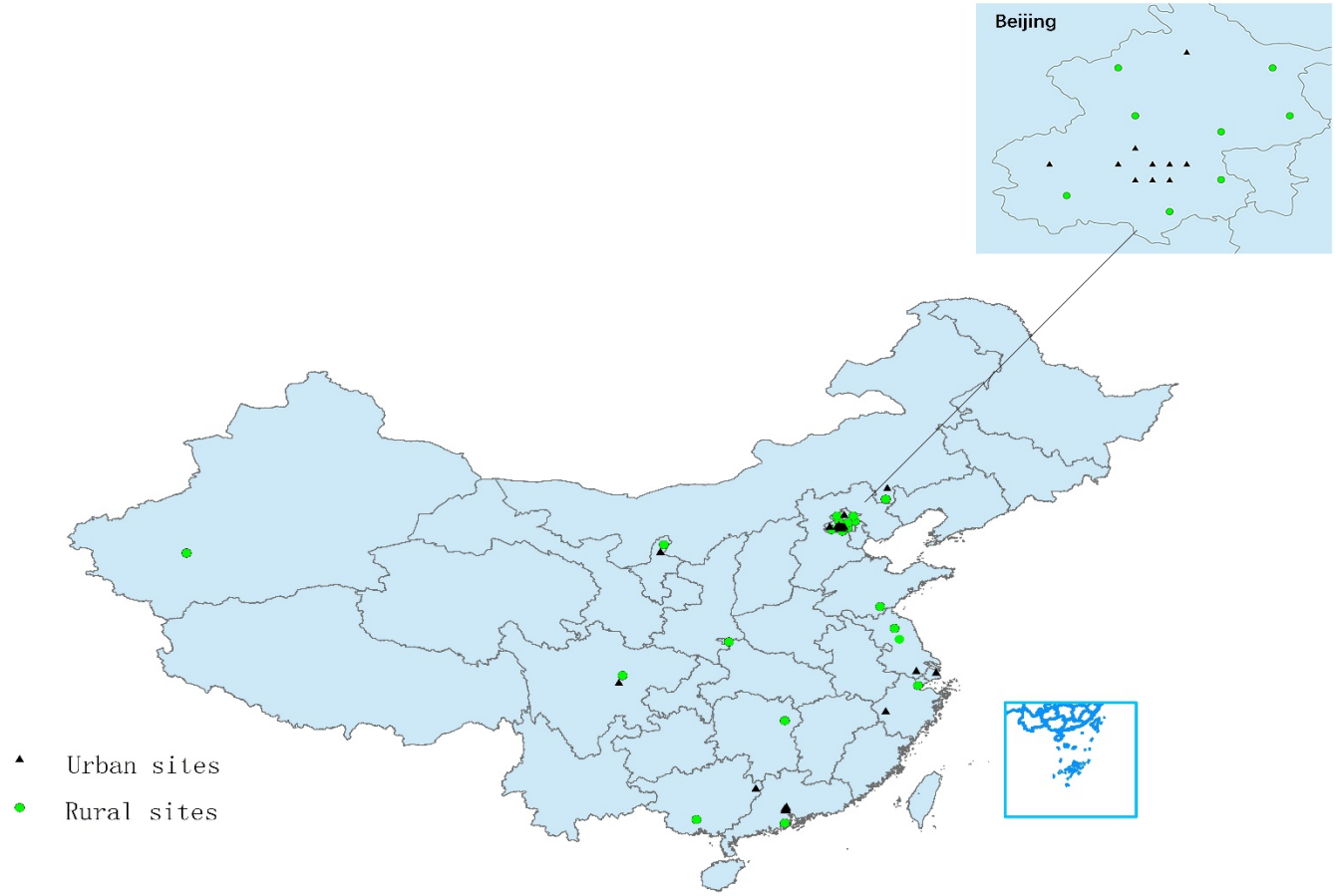
No	41,114	1.30 (1.23, 1.36)	0.025	1.38 (1.31, 1.45)	0.003
Yes	1,220	1.23 (1.16, 1.32)		1.28 (1.20, 1.38)	

Abbreviations: CKD, chronic kidney disease; BMI, body mass index.

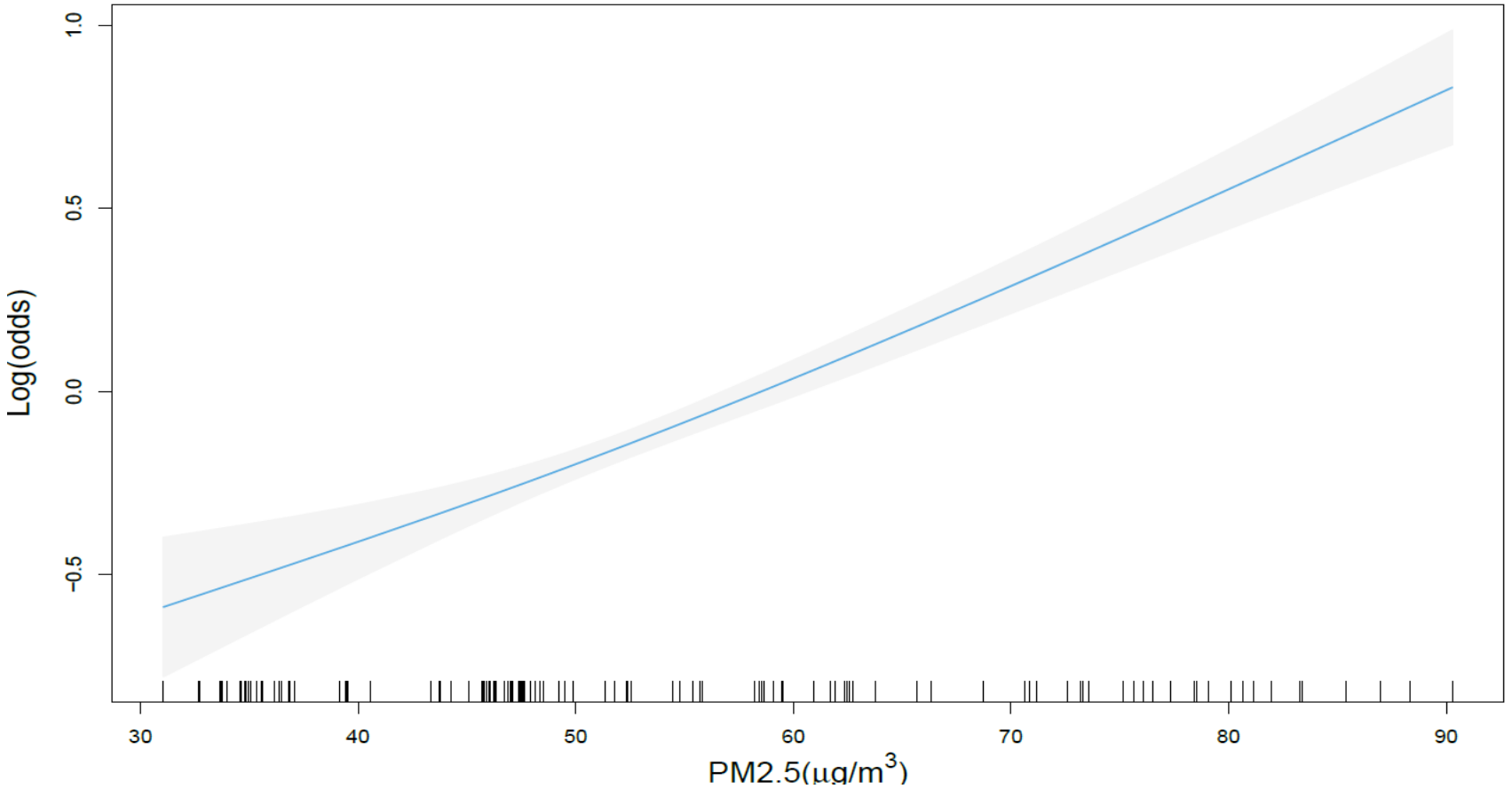
Model 2 adjustment (as illustrated in Supplemental Table 4 footnote) was used for the stratified analyses. The analysis was performed for an increase of 10 $\mu g/m^3$ in $PM_{2.5}$.



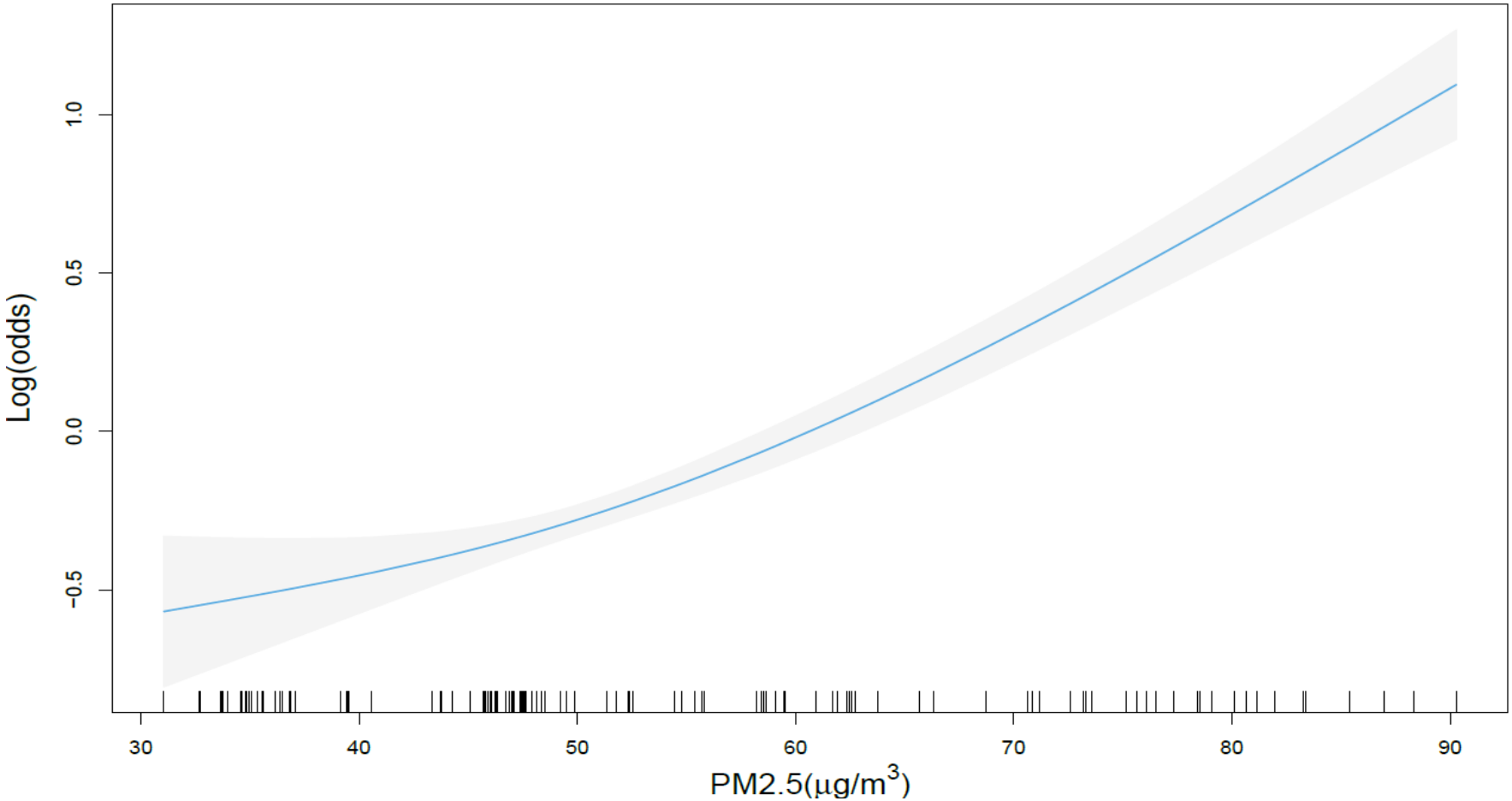
Supplemental Figure 1. CONSORT diagram of study participants recruitment in the analysis.



Supplemental Figure 2. Distribution of the study sites in both urban and rural areas. Note: Triangle indicates the urban sites, and circular indicates the rural sites



Supplemental Figure 3 (A). Exposure-response curve of 1-year mean $PM_{2.5}$ exposure with the prevalence of chronic kidney disease in China between 2007 and 2010.



Supplemental Figure 3(B). Exposure-response curve of 1-year mean $PM_{2.5}$ exposure with albuminuria in China between 2007 and 2010.