Supplementary material

Seasonal temperature variability and emergency hospital admissions for respiratory diseases: a population-based cohort study

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Table S1. Hazard ratio (HR) and 95% CI per 1^{o}C increase of seasonal temperature variability on incident respiratory diseases after excluding participants who changed their home addresses during the follow-up period in the prospective Chinese elderly cohort in Hong Kong.

Incident Diseases	Cases	Summertime temperature variability		Wintertime temperature variability	
		Basic model*	Full model†	Basic model*	Full model†
Total respiratory diseases	11518	1.17 (0.93, 1.47)	1.05 (0.81, 1.36)	1.50 (1.38, 1.63)	1.19 (1.08, 1.32)
Pneumonia	6058	1.13 (0.82, 1.56)	1.10 (0.78, 1.56)	1.32 (1.18, 1.47)	1.18 (1.02, 1.35)
COPD	2798	1.26 (0.80, 1.96)	1.15 (0.70, 1.91)	1.94 (1.64, 2.30)	1.41 (1.14, 1.74)

Abbreviations: COPD=chronic obstructive pulmonary disease.

*Stratified by age in years, adjusting for sex and year of follow-up, and summertime temperature variability and wintertime temperature variability were mutual adjusted.

†Additionally adjusted for yearly mean temperature, marital status, housing type, BMI, education attainment, personal monthly expenditure, physical activity, medication taken, smoking status, social deprivation index (SDI), and smoking rate at the district level.

Table S2. Hazard ratio (HR) and 95% CI per 1^{o}C increase of seasonal temperature variability on incident respiratory diseases using inverse distance weighting to predict daily temperature.

Incident Diseases	Cases	Summertime temperature variability		Wintertime temperature variability	
		Basic model*	Full model†	Basic model*	Full model†
Total respiratory diseases	12689	1.08 (0.76, 1.53)	0.93 (0.65, 1.34)	1.76 (1.57, 1.97)	1.26 (1.08, 1.46)
Pneumonia	6672	0.94 (0.58, 1.52)	0.88 (0.54, 1.45)	1.44 (1.24, 1.68)	1.19 (0.98, 1.46)
COPD	3075	0.93 (0.46, 1.87)	0.76 (0.36, 1.57)	2.33 (1.85, 2.95)	1.39 (1.03, 1.89)

Abbreviations: COPD=chronic obstructive pulmonary disease.

*Stratified by age in years, adjusting for sex and year of follow-up, and summertime temperature variability and wintertime temperature variability were mutual adjusted.

†Additionally adjusted for yearly mean temperature, marital status, housing type, BMI, education attainment, personal monthly expenditure, physical activity, medication taken, smoking status, social deprivation index (SDI), and smoking rate at the district level.

Table S3. Hazard ratio (HR) and 95% CI per 1^{o}C increase in summertime temperature variability stratified by population characteristics in the prospective Chinese elderly cohort in Hong Kong, 1998 – 2010.

Stratified Characteristics	Total respiratory (n=12689)			Pneumonia (n=6672)			COPD (n=3075)		
	Cases	HR (95% CI)	$P_{Interaction}$	Cases	HR (95% CI)	$P_{Interaction}$	Cases	HR (95% CI)	$P_{Interaction}$
Age, yr									
≤70	3596	0.88 (0.62, 1.27)		1599	0.85 (0.50, 1.45)		855	1.16 (0.56, 2.39)	
>70	9093	1.07 (0.83, 1.40)	0.30	5073	1.10 (0.77, 1.57)	0.35	2220	1.01 (0.60, 1.70)	0.73
Sex									
Male	5368	0.92 (0.71, 1.20)		2901	0.81 (0.56, 1.16)		1792	0.88 (0.53, 1.46)	
Female	7321	1.09 (0.85, 1.40)	0.07	3771	1.25 (0.89, 1.78)	0.001	1283	1.32 (0.78, 2.23)	0.04
Marital status									
Unmarried	6802	1.03 (0.80, 1.33)		3607	1.06 (0.75, 1.50)		1536	1.30 (0.78, 2.17)	
Married	5887	1.00 (0.77, 1.30)	0.75	3065	1.01 (0.70, 1.45)	0.72	1539	0.83 (0.50, 1.40)	0.02
Education attainment									
Below Primary	6350	1.00 (0.78, 1.29)		3300	1.11 (0.78, 1.59)		1398	1.17 (0.70, 1.96)	
Primary	4557	1.01 (0.77, 1.33)	0.91	2388	0.94 (0.65, 1.36)	0.23	1268	0.90 (0.53, 1.52)	0.20
Secondary or above	1782	1.10 (0.78, 1.53)	0.52	984	1.02 (0.65, 1.62)	0.67	409	1.16 (0.58, 2.32)	0.98
Housing condition									
Public and aided	5544	0.93 (0.71, 1.21)		2862	1.00 (0.70, 1.44)		1403	1.00 (0.59, 1.70)	
Private	5714	1.13 (0.87, 1.46)	0.05	3002	1.10 (0.77, 1.57)	0.53	1340	1.04 (0.62, 1.74)	0.85
Other	1431	0.88 (0.61, 1.26)	0.73	808	0.92 (0.56, 1.51)	0.70	332	1.27 (0.61, 2.67)	0.48
Expenses/money in USD$									
Low [<128]	1857	1.01 (0.73, 1.39)		1001	0.98 (0.63, 1.53)		427	1.08 (0.56, 2.09)	
Medium [128-384]	8700	1.03 (0.80, 1.32)	0.88	4508	1.05 (0.75, 1.48)	0.70	2181	1.01 (0.62, 1.65)	0.82
High [≥385]	2132	0.96 (0.70, 1.33)	0.79	1163	1.03 (0.66, 1.61)	0.81	467	1.28 (0.65, 2.51)	0.64

Figure S1. Temporal variations of yearly and seasonal mean temperature from 1998 to 2010 in Hong Kong. Ambient temperatures were taken average of the 22 weather monitoring stations.