

Additional file

Table S1: Types of interaction between two factors

Interactive effects	Condition
Two-factor enhancement	$Q(X_I \cap X_2) > \max(Q(X_I), Q(X_2))$
Nonlinear enhancement	$Q(X_I \cap X_2) > Q(X_I) + Q(X_2)$
Single-factor nonlinearities, weaken	$\min(Q(X_I), Q(X_2)) < Q(X_I \cap X_2) < \max(Q(X_I), Q(X_2))$
Nonlinear weakening	$Q(X_I \cap X_2) < \min(Q(X_I), Q(X_2))$
Independent	$Q(X_I \cap X_2) = Q(X_I) + Q(X_2)$

The symbol of “ \cap ” means the interaction of two factors, and $Q(X_I \cap X_2)$ represents the Q -value for the interaction between two factors X_I and X_2 .

Table S2: Overview of socio-economic, public health and environmental factors in Xinjiang, China,

2011-2019					
Variable		Mean	25%percentile	50%percentile	75%percentile
Environmental factors	PM2.5 （μg/m ³ ）	43.51	28.23	38.73	54.65
	Temperature （℃）	8.82	7.53	8.51	9.97
	Wind speed （m/s）	2.20	1.83	2.19	2.45
	Relative humidity(RH%)	51.49	45.13	52.71	57.33
	Precipitation(mm)	256.37	215.32	250.23	291.47
Socioeconomic factors	Per capita GDP(/10,000RMB)	5.05	2.69	4.25	6.87
	Population density(persons/sq.km)	25.69	8.23	14.06	19.90
	Revenue(/10,000RMB)	757806.12	261410.00	489168.50	833921.75
	TRSCG(/10,000RMB)	1634245.05	457587.50	787891.50	1699853.00
Public health factor	Number of hospital beds(/10,000 persons)	62.56	53.60	58.18	65.81
	Health personnel(person)	10851.87	4081.75	6915.50	11753.25
	URBMI(/10,000 persons)	50.06	10.06	25.48	50.72