

Supplementary Table S1. Descriptive summary for ILI incidence, meteorological factors and PM_{2.5} in Mississippi, 2011–2020

Variables	Mean	Std	P ₂₅	P ₅₀	P ₇₅	Min.	Max.
ILI incidence (per 100,000)	18.81	13.46	9.61	14.20	22.67	3.35	81.23
Temperature (°C)	18.54	7.26	12.11	18.97	25.73	0.13	30.26
Wind speed (m/s)	2.73	0.81	2.05	2.71	3.30	0.82	5.03
Precipitation (mm)	31.25	37.67	3.31	19.56	42.93	0.00	283.21
Pressure (kpa)	100.55	0.35	100.32	100.50	100.77	99.75	101.97
Relative humidity (%)	71.46	7.10	67.14	71.71	76.43	47.29	88.57
PM _{2.5} (µg/m ³)	9.07	2.82	7.17	8.44	10.49	3.47	24.20

Note. ILI: influenza-like illness.

Supplementary Table S2. Spearman correlation of meteorological factors and PM_{2.5} with ILI incidence in Mississippi, 2011–2020

	Temperature	Wind speed	Precipitation	Pressure	Relative humidity	PM _{2.5}
ILI incidence	−0.854**	0.430**	0.049	0.539**	−0.087	−0.360**

Note. ** $P < 0.001$. ILI: influenza-like illness.

Supplementary Table S3. The *RR* values of the effect of temperatures at each percentile node on ILI at lag of 0–4 weeks

Lag weeks	Values	P ₁ = 2.85 °C	P ₁₀ = 8.62 °C	P ₉₀ = 27.52 °C	P ₉₉ = 29.21 °C
0	<i>RR</i>	1.529*	1.369*	0.667*	0.617*
	(95% <i>CI</i>)	1.350–1.732	1.276–1.469	0.601–0.741	0.542–0.701
1	<i>RR</i>	1.411*	1.275*	0.763*	0.725*
	(95% <i>CI</i>)	1.312–1.518	1.225–1.328	0.721–0.808	0.676–0.778
2	<i>RR</i>	1.303*	1.188*	0.873*	0.853*
	(95% <i>CI</i>)	1.253–1.354	1.164–1.212	0.852–0.895	0.827–0.879
3	<i>RR</i>	1.202*	1.106*	0.999	1.003
	(95% <i>CI</i>)	1.129–1.281	1.069–1.146	0.944–1.056	0.937–1.074
4	<i>RR</i>	1.110	1.031	1.143*	1.180*
	(95% <i>CI</i>)	0.991–1.242	0.967–1.099	1.03–1.268	1.039–1.34
0–4	<i>RR</i>	3.750*	2.366*	0.508*	0.451*
	(95% <i>CI</i>)	3.087–4.556	2.139–2.616	0.448–0.575	0.387–0.526

Note. * $P < 0.05$. ILI: influenza-like illness.

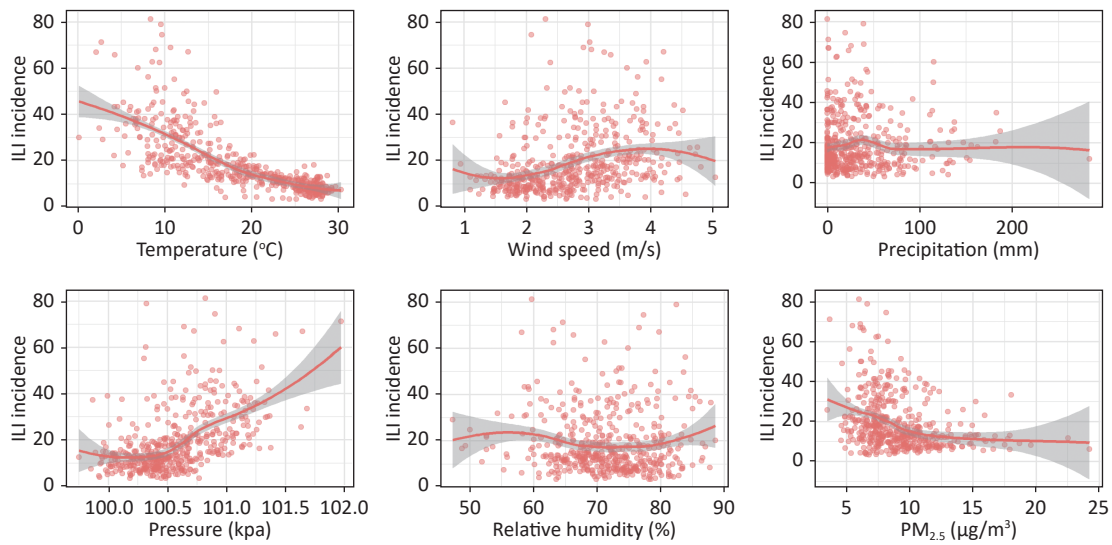
Supplementary Table S4. The *RR* values of the effect of pressures at each percentile node on ILI at lag of 0–4 weeks

Lag weeks	Values	P ₁ = 99.92 kpa	P ₁₀ = 100.11 kpa	P ₉₀ = 101.06 kpa	P ₉₉ = 101.42 kpa
0	<i>RR</i>	0.988	1.025	1.013	1.052
	(95% <i>CI</i>)	0.816–1.196	0.923–1.137	0.913–1.123	0.923–1.199
1	<i>RR</i>	0.957	0.971	1.126*	1.247*
	(95% <i>CI</i>)	0.813–1.127	0.885–1.066	1.035–1.225	1.125–1.383
2	<i>RR</i>	0.962	0.941	1.107*	1.262*
	(95% <i>CI</i>)	0.841–1.1	0.873–1.015	1.04–1.178	1.167–1.366
3	<i>RR</i>	0.980	0.923	1.048	1.191*
	(95% <i>CI</i>)	0.828–1.159	0.842–1.013	0.962–1.14	1.075–1.32
4	<i>RR</i>	0.988	0.907	1.041	1.146*
	(95% <i>CI</i>)	0.813–1.202	0.815–1.008	0.941–1.151	1.018–1.29
0–4	<i>RR</i>	0.880	0.784	1.375*	2.261*
	(95% <i>CI</i>)	0.564–1.372	0.613–1.002	1.116–1.695	1.783–2.868

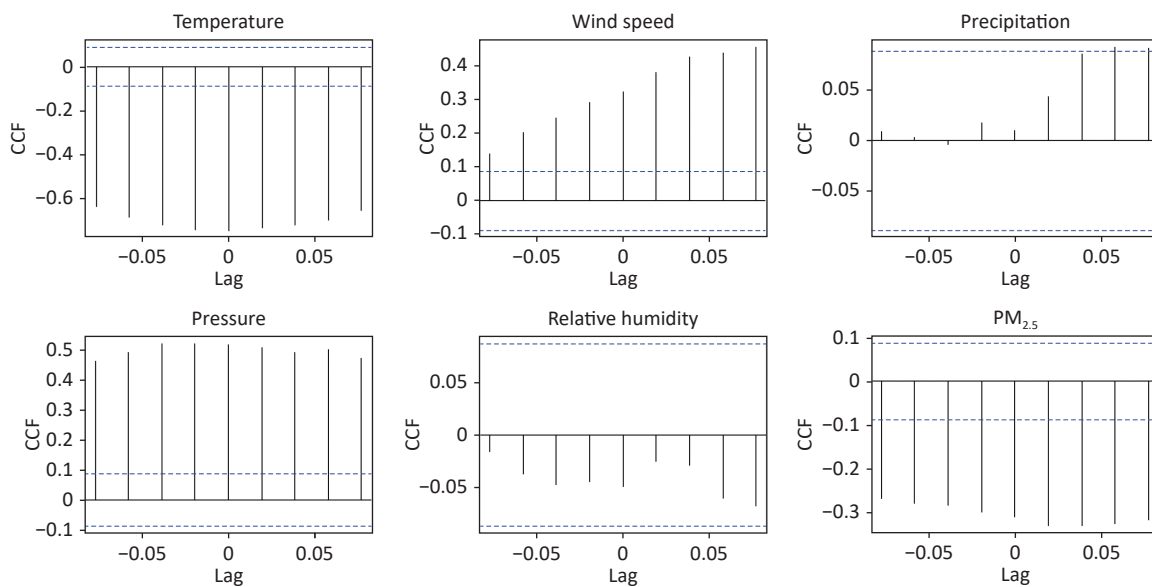
Note. * $P < 0.05$.

Supplementary Table S5. Comparison between SARIMA model and SARIMAX model of ILI incidence

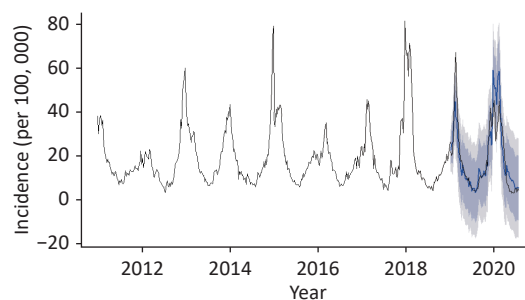
Model	β	<i>P</i>	Ljung-Box Q Test		MAE	RMSE	MAPE
			Statistics	<i>P</i>			
SARIMA (1, 0, 0) (1, 1, 0) ₅₂	–	–	21.822	0.149	5.230	7.905	33.698
AR1	0.886	<0.001	–	–	–	–	–
SAR1	–0.607	<0.001	–	–	–	–	–
SARIMAX (1, 0, 0) (1, 1, 0) ₅₂	–	–	1.900	0.168	5.222	7.885	33.386
AR1	0.865	<0.001	–	–	–	–	–
SAR1	0.097	0.065	–	–	–	–	–
Temperature lag1	–0.211	0.049	–	–	–	–	–
Wind speed lag0	–0.596	0.026	–	–	–	–	–
Pressure lag4	–1.672	0.004	–	–	–	–	–



Supplementary Figure S1. Scatter plot of meteorological factors and $PM_{2.5}$ with ILI incidence. ILI: influenza-like illness.



Supplementary Figure S2. Correlations with pre-whitened meteorological factors and $PM_{2.5}$. CCF: Cross-correlation Function.



Supplementary Figure S3. The observed and predicted value of influenza-like illness (ILI) incidence in Mississippi.