SUPPLEMENTARY TABLE. Asthma-associated emergency department visit volume and percentage of visit anomalies during days with wildfire smoke exposure, by age group and United States Department of Health and Human Services region — National Syndromic Surveillance Program, United States, April 30–August 4, 2023

Region	Age group (yrs)	Wildfire smoke exposure dates	Days with wildfire smoke exposure (n)	Percentage of air quality monitors* reporting wildfire smoke exposure, range	Percent of Visit anomalies† during exposure days (n, %)	Visit volume anomalies§ during exposure days (n, %)	No. excess visits compared with expected
1	0–4	Jun 7	1	5.7	0 (—)	0 (—)	2
	5–17	Jun 7	1	5.7	0 (—)	0 (—)	–1
	18–64	Jun 7	1	5.7	0 (—)	0 (—)	–6
	≥65	Jun 7	1	5.7	0 (—)	0 (—)	3
	All	Jun 7	1	5.7	0 (—)	0 (—)	–3
2	0–4	Jun 6–8	3	4.8–69.0	0 (—)	0 (—)	–9
	5–17	Jun 6–8	3	4.8–69.0	2 (66.7)	2 (66.7)	123
	18–64	Jun 6–8	3	4.8–69.0	2 (66.7)	2 (66.7)	251
	≥65	Jun 6–8	3	4.8–69.0	1 (33.3)	1 (33.3)	12
	All	Jun 6–8	3	4.8–69.0	2 (66.7)	2 (66.7)	364
	0–4	Jun 29	1	2.4	0 (—)	0 (—)	1
	5–17	Jun 29	1	2.4	0 (—)	0 (—)	–12
	18–64	Jun 29	1	2.4	0 (—)	0 (—)	–18
	≥65	Jun 29	1	2.4	0 (—)	0 (—)	–5
	All	Jun 29	1	2.4	0 (—)	0 (—)	–35
3	0–4	Jun 6–8	3	1.2–41.0	0 (—)	0 (—)	–2
	5–17	Jun 6–8	3	1.2–41.0	0 (—)	0 (—)	–2
	18–64	Jun 6–8	3	1.2–41.0	2 (66.7)	2 (66.7)	128
	≥65	Jun 6–8	3	1.2–41.0	0 (—)	0 (—)	3
	All	Jun 6–8	3	1.2–41.0	1 (33.3)	2 (66.7)	179
	0–4	Jun 28–29	2	15.7–20.5	0 (—)	0 (—)	–9
	5–17	Jun 28–29	2	15.7–20.5	0 (—)	0 (—)	–27
	18–64	Jun 28–29	2	15.7–20.5	0 (—)	0 (—)	1
	≥65	Jun 28–29	2	15.7–20.5	0 (—)	0 (—)	2
	All	Jun 28–29	2	15.7–20.5	0 (—)	0 (—)	–35
4	0–4	Jun 28	1	0.6	0 (—)	1 (100.0)	12
	5–17	Jun 28	1	0.6	0 (—)	1 (100.0)	30
	18–64	Jun 28	1	0.6	0 (—)	0 (—)	–18
	≥65	Jun 28	1	0.6	0 (—)	0 (—)	–1
	All	Jun 28	1	0.6	0 (—)	1 (100.0)	41
5	0–4	Jun 14	1	4.2	0 (—)	0 (—)	–1
	5–17	Jun 14	1	4.2	0 (—)	0 (—)	–14
	18–64	Jun 14	1	4.2	0 (—)	0 (—)	11
	≥65	Jun 14	1	4.2	0 (—)	0 (—)	8
	All	Jun 14	1	4.2	1 (100.0)	0 (—)	25
	0–4	Jun 27–29	3	11.9–56.6	0 (—)	0 (—)	–2
	5–17	Jun 27–29	3	11.9–56.6	1 (33.3)	1 (33.3)	14
	18–64	Jun 27–29	3	11.9–56.6	2 (66.7)	2 (66.7)	155
	≥65	Jun 27–29	3	11.9–56.6	0 (—)	0 (—)	7

	All	Jun 27–29	3	11.9–56.6	1 (33.3)	2 (66.7)	172
6	0–4	—	0	—	—	—	—
	5–17	—	0	—	—	—	—
	18–64	—	0	—	—	—	—
	≥65	—	0	—	—	—	—
	All	—	0	—	—	—	—
7	0–4	May 18	1	2.3	0 (—)	0 (—)	0
	5–17	May 18	1	2.3	0 (—)	0 (—)	–5
	18–64	May 18	1	2.3	0 (—)	0 (—)	–4
	≥65	May 18	1	2.3	0 (—)	0 (—)	–1
	All	May 18	1	2.3	0 (—)	0 (—)	–11
	0–4	Jun 27–29	3	4.7–14.0	0 (—)	0 (—)	2
	5–17	Jun 27–29	3	4.7–14.0	0 (—)	0 (—)	–4
	18–64	Jun 27–29	3	4.7–14.0	0 (—)	0 (—)	–3
	≥65	Jun 27–29	3	4.7–14.0	0 (—)	0 (—)	–1
	All	Jun 27–29	3	4.7–14.0	0 (—)	0 (—)	–8
8	0–4	May 17–18	2	3.1–12.5	0 (—)	0 (—)	–2
	5–17	May 17–18	2	3.1–12.5	0 (—)	0 (—)	–4
	18–64	May 17–18	2	3.1–12.5	1 (50.0)	1 (50.0)	18
	≥65	May 17–18	2	3.1–12.5	0 (—)	0 (—)	1
	All	May 17–18	2	3.1–12.5	0 (—)	0 (—)	13
	0–4	May 21	1	1.0	0 (—)	0 (—)	–1
	5–17	May 21	1	1.0	0 (—)	0 (—)	1
	18–64	May 21	1	1.0	0 (—)	0 (—)	–2
	≥65	May 21	1	1.0	0 (—)	0 (—)	0
	All	May 21	1	1.0	0 (—)	0 (—)	–2
9	0–4	Jul 05	1	0.5	0 (—)	0 (—)	4
	5–17	Jul 05	1	0.5	0 (—)	0 (—)	0
	18–64	Jul 05	1	0.5	0 (—)	0 (—)	–7
	≥65	Jul 05	1	0.5	0 (—)	0 (—)	4
	All	Jul 05	1	0.5	0 (—)	0 (—)	0
	0–4	Jul 14–16	3	0.5–0.5	0 (—)	0 (—)	–1
	5–17	Jul 14–16	3	0.5–0.5	0 (—)	0 (—)	–9
	18–64	Jul 14–16	3	0.5–0.5	0 (—)	0 (—)	–5
	≥65	Jul 14–16	3	0.5–0.5	0 (—)	0 (—)	6
	All	Jul 14–16	3	0.5–0.5	0 (—)	0 (—)	–11
10	0–4	May 25–26	2	0.5–0.5	0 (—)	0 (—)	–3
	5–17	May 25–26	2	0.5–0.5	0 (—)	0 (—)	3
	18–64	May 25–26	2	0.5–0.5	0 (—)	1 (50.0)	10
	≥65	May 25–26	2	0.5–0.5	0 (—)	0 (—)	1
	All	May 25–26	2	0.5–0.5	0 (—)	0 (—)	11
	0–4	Jul 5	1	0.5	0 (—)	0 (—)	0
	5–17	Jul 5	1	0.5	0 (—)	0 (—)	0
	18–64	Jul 5	1	0.5	0 (—)	0 (—)	3
	≥65	Jul 5	1	0.5	0 (—)	0 (—)	0
	All	Jul 5	1	0.5	0 (—)	0 (—)	2
	0–4	Jul 24	1	0.5	0 (—)	0 (—)	–1

5–17	Jul 24	1	0.5	0 (—)	0 (—)	2
18–64	Jul 24	1	0.5	0 (—)	0 (—)	1
≥65	Jul 24	1	0.5	0 (—)	0 (—)	0
All	Jul 24	1	0.5	0 (—)	0 (—)	1
0–4	Jul 26–27	2	0.5–0.5	0 (—)	0 (—)	0
5–17	Jul 26–27	2	0.5–0.5	0 (—)	0 (—)	–5
18–64	Jul 26–27	2	0.5–0.5	0 (—)	0 (—)	–11
≥65	Jul 26–27	2	0.5–0.5	0 (—)	0 (—)	–1
All	Jul 26–27	2	0.5–0.5	0 (—)	0 (—)	–18

Abbreviations: EWMA = exponentially weighted moving average; $PM_{2.5}$ = particulate matter with an aerodynamic diameter ≤2.5 µm.

* $PM_{2.5}$ values are reported at air quality monitor and aggregated across 24-hour periods. These monitor-level data are used at the Department of Health and Human Services regional level, with the maximum and minimum air quality monitor daily $PM_{2.5}$ values. Air quality monitors from all 50 states and District of Columbia are included. For the given period, 971–1,012 air quality monitors were reporting on a given day. Air quality monitors can report negative numbers or zero values. Air quality monitors not reporting on a given day were not categorized. Consistent reporting of air quality monitors was reported during the study period with >76% of air quality monitors in each region reporting daily.

† The anomaly detection method is automated to alternate between adaptive multiple linear regression and EWMA based on the data in the baseline. When the regression model does not fit the baseline data well based on adjusted R-squared values (i.e., adjusted R-squared <0.60), then EWMA is used. Adaptive multiple linear regression fits a model to a baseline of 28 days and forecasts a predicted value 3 days after the last day of the baseline. The model adjusts for linear trends, day-of-week effects, and holidays. The predicted value is compared with the observed value and divided by the standard error of the prediction. In EWMA, weighted averages of recent data are compared with the average of the 28-day baseline and divided by the standard deviation. When the p-value resulting from the student's t-test applied to the test statistic is <0.05, the data point is classified as an anomaly.

§Time series anomaly detection method examining visit volume of visits reporting asthma as the chief complaint using the same alternating anomaly detection method described previously for percentage of visits.