Wildfires in California:
Emergency Department Visits Around November 2018

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November 7, 2019

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OVERVIEW

This descriptive analysis looked at emergency department (ED) utilization for select conditions (e.g., smoke inhalation and burns) from October–December 2018 in California when active wildfires in California affected the air quality. The focus of the analysis were areas of Northern and Southern California that had four fires starting on the same day, November 8, 2018. In Northern California, there was the Camp Fire in Butte County that burned 153,336 acres and was active for 17 days, in addition to the smaller Nurse Fire in Solano County (1,500 acres).[1] In Southern California, there were two fires that remained active for 56 days: the Woolsey File in Los Angeles and Ventura Counties (96,949 acres) and the smaller Hill Fire in Ventura County (4,531 acres).[1]

METHODS

Defining Groups of California Counties

The counties in California were grouped into air basins with similar meteorological and geographic conditions as defined by the California Air Resources Board under the California Environmental Protection Agency. The California Air Resources Board defines 15 air basins with some counties included in more than one air basin.[2] For this analysis, counties could only be assigned to one air basin and each air basin needed to include at least 3 hospitals. This resulted in 12 air basins with the air basins for Lake Tahoe and Lake County not being reported separately and the air basins for the Salton Sea and San Diego County combined. Figure 1 shows the map of the California counties by the 12 air basins used for this analysis. A comparison of the original 15 air basins to the 12 used for this analysis is provided in Appendix A.

[1] Information on the fires was obtained from the California Department of Forestry & Fire Protection Incident Database available at https://www.fire.ca.gov/incidents. Accessed October 29, 2019.
[2] Information on counties included in the California air basins was obtained from the California Air Resources Board website at https://ww3.arb.ca.gov/ei/maps/2017statemap/abmap.htm. Accessed November 4, 2019.

Figure 1. California Counties Grouped into Air Basins for Reporting Daily Emergency Department Utilization

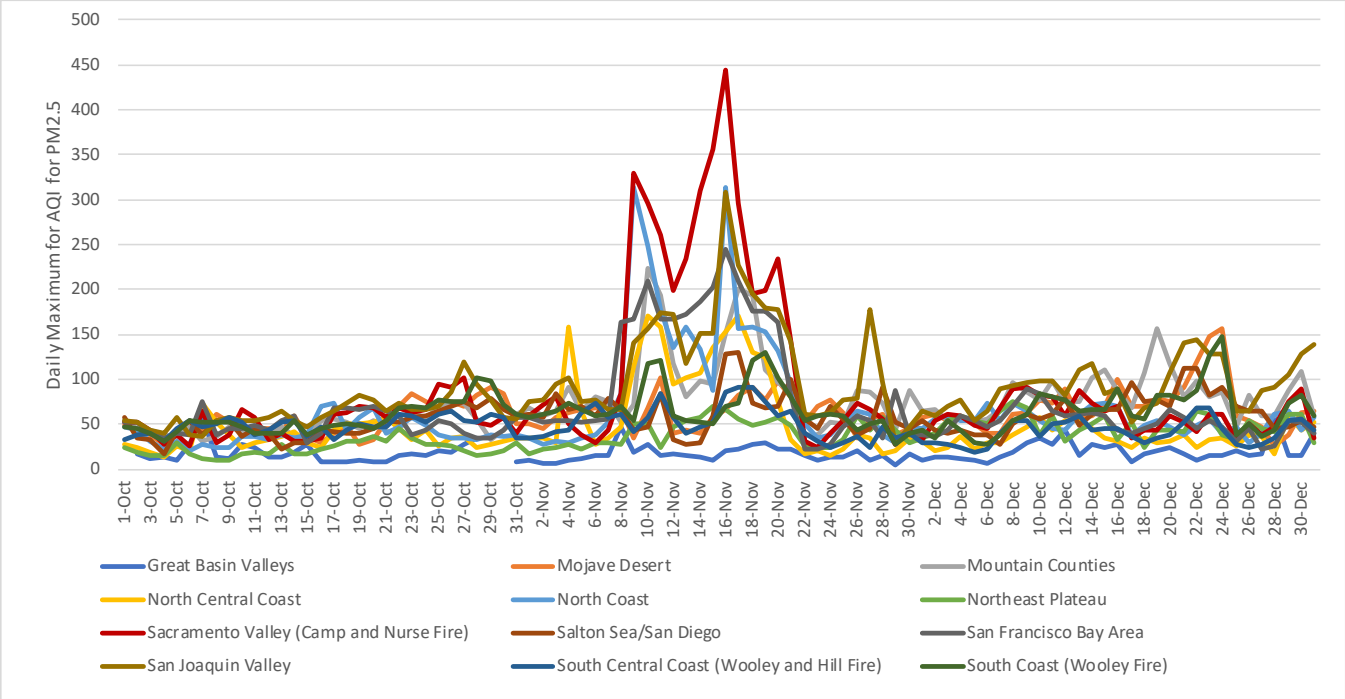
Air Quality Index

The Air Quality Index (AQI) is a measurement used in the United States for reporting air quality. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. The Environmental Protection Agency (EPA) has defined the following ranges of the AQI for $PM_{2.5}$ (inhalable particulate matter with diameters generally 2.5 micrometers and smaller):[3]

- The range of 0–50 indicates air quality conditions are *good*
- The range 51–100 indicates air quality conditions are *moderate*
- The range 101–150 indicates air quality conditions are *unhealthy for sensitive groups*
- The range 151–200 indicates air quality conditions are *unhealthy*
- The range 201–300 indicates air quality conditions are *very unhealthy*
- The range 301–500 indicates air quality conditions are *hazardous.*

Daily information on $PM_{2.5}$ levels was available from the California Air Resources Board. We extracted three months (October–December 2018) of daily 24-hour averages for $PM_{2.5}$ for the 134 measurement stations across California from the publicly available online query tool for Air Quality Data Statistics. The 24-hour averages were converted to an AQI using the publicly available AQI Calculator on the EPA website. The information from the measurement stations was aggregated into a single daily measurement for each of the 12 air basins by using the maximum AQI value for the air basin on each day. Figure 2 shows daily AQI for the 12 air basins from October to December 2018.

Figure 2. California Air Quality Index by Air Basin, October to December 2018



[3] Information on the AQI was obtained from the United States Environmental Protection Agency at https://airnow.gov/index.cfm?action=aqibasics.aqi. Accessed November 1, 2019.

Three air basins showed that the Air Quality Index (AQI) was in a range that indicated *hazardous* air quality conditions (AQI above 300) for at least one day in the month of November:

- Sacramento Valley air basin (location of Camp and Nurse Fires)
- North Coast, west of the Sacramento Valley
- San Joaquin Valley, south of the Sacramento Valley.

Another three air basins showed that the AQI was in a range that indicated *unhealthy to very unhealthy* air quality conditions (AQI of 151–300) for at least one day in the month of November:

- San Francisco Bay Area
- Mountain Counties
- North Central Coast.

In the remaining six air basins the air quality stayed in the good to moderate range (AQI of 100 or less) for most of November:

- South Coast [location of the Woolsey Fire]
- South Central Coast [location of the Woolsey and Hill Fires]
- Northeast Plateau
- Mojave Desert
- Great Basin Valleys
- Salton Sea/San Diego.

HCUP Databases

ED utilization data was extracted from the Healthcare Cost and Utilization Project (HCUP) State Emergency Department Databases (SEDD) and State Inpatient Databases (SID) for California. The analysis file included all SEDD records, which capture ED visits that do not result in admission to the same hospital, and a subset of SID records, those which indicated ED visits that result in admission to the same hospital. Together, this encompassed 3.5 million ED visits in California between October and December 2018. Additional information on HCUP is available in Appendix B.

The HCUP data were aggregated by county of patient residence, as assigned from patient ZIP Code, with the following exceptions:

- Hospital county was used if the patient was homeless, foreign, or the ZIP Code was missing/invalid.
- Hospital county was used for out-of-state patients if their ZIP Code was greater than 250 miles away from the ZIP Code of the California hospital. This excludes those living near the California border but includes patients who were most likely traveling to California during the time of the fire.

Conditions of Interest

ED visits were selected based on six condition groups of interest. The condition groups were not mutually exclusive; a patient with multiple conditions would be counted in each category. Condition groups were defined using all-listed International Classification of Diseases, 10th Revision, Clinical

Modification (ICD-10-CM) diagnosis codes (i.e., both principal diagnosis and secondary diagnoses). The ICD-10-CM coding definitions for each condition are available in Appendix C.

- Fire-specific ED visits: (1) Smoke inhalation and (2) initial encounter for exposure/toxic effect of fire/smoke
- General condition ED visits: (3) initial encounter for burns (including but not limited to fire burns), (4) all respiratory conditions other than smoke inhalation, (5) initial encounter for injury (including burns), and (6) all ED visits.

RESULTS

The descriptive analysis includes a series of trend graphs comparing ED utilization with the daily maximum of the AQI for $PM_{2.5}$ in measurement stations in the air basin.

Each figure presents a single condition for one of the 12 air basins.

- **The blue line indicates the daily ED utilization for residents of the counties in the air basin, with y-axis values to the left of the graph.** The maximum for the ED utilization y-axis varies across conditions and sometimes across air basins within condition. All values smaller than 11 (including 0) were set to '11' to protect patient confidentiality.
- **The gray line indicates the daily maximum of the AQI for the $PM_{2.5}$ measurement, with y-axis values to the right of the graph.** The maximum for the AQI y-axis is set to 500 on all figures.
- The red vertical line indicates November 8th, 2018.

The order of the figures is as follows:

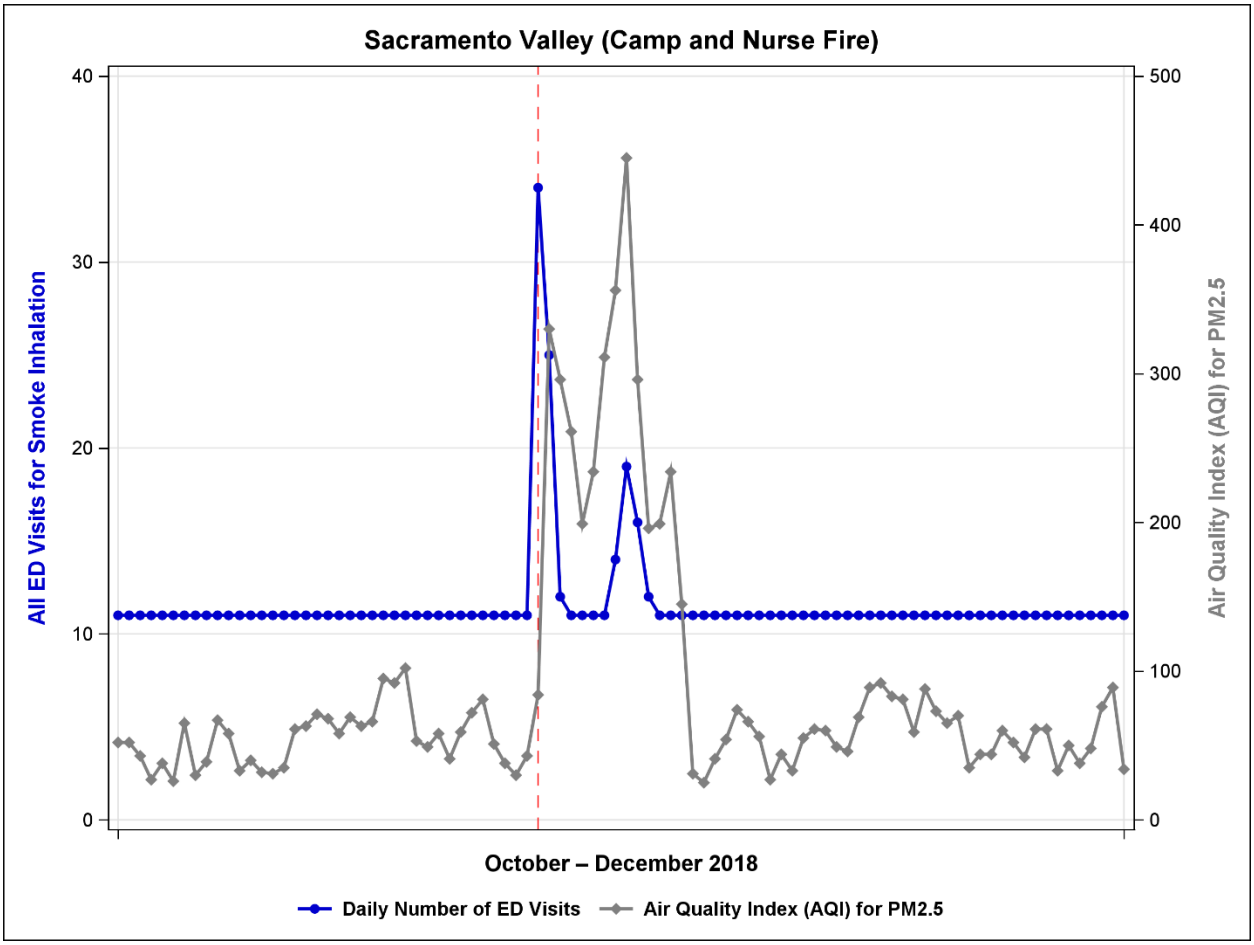
- Three air basins in which the AQI was in a range that indicated *hazardous* air quality conditions for at least one day in the month of November:
    - Sacramento Valley (location of the Camp and Nurse Fires), North Coast, San Joaquin Valley
- Three air basins in which the AQI was in a range that indicated *unhealthy to very unhealthy* air quality conditions for at least one day in the month of November.
    - San Francisco Bay Area, Mountain Counties and North Central Coast:
- The remaining six air basins in which the air quality stayed in the good to moderate range for most of November:
    - South Coast (location of the Woolsey Fire), South Central Coast (location of the Woolsey and Hill Fires), Northeast Plateau, Mojave Desert, Great Basin Valleys, Salton Sea/San Diego.

Smoke Inhalation

Figures 3a–3l present ED visits for smoke inhalation. The maximum for the y-axis indicating ED visits for smoke inhalation is set to 40 for all figures.

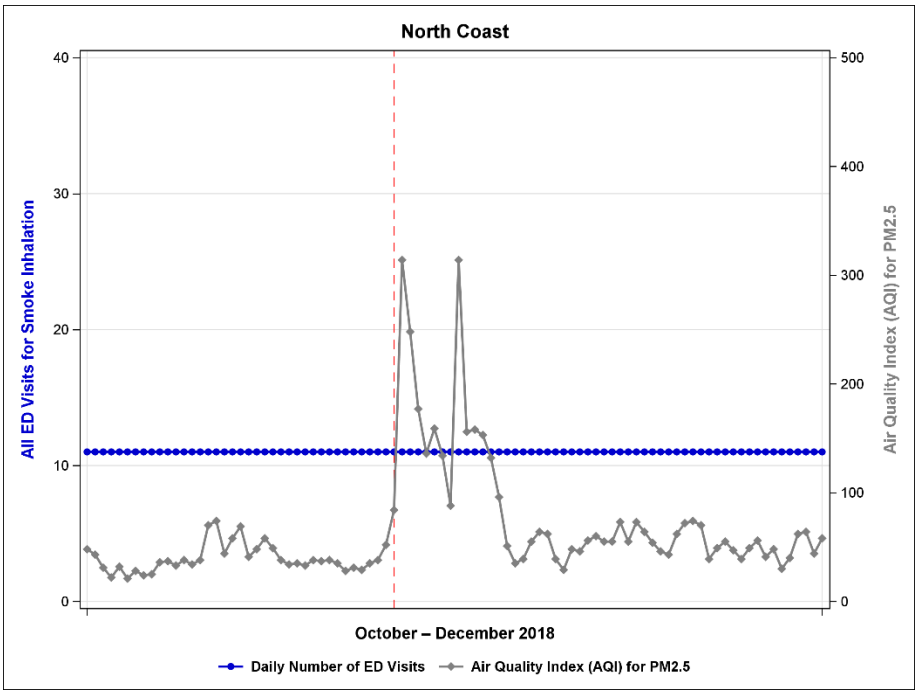
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 3a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Sacramento Valley, California, October–December 2018



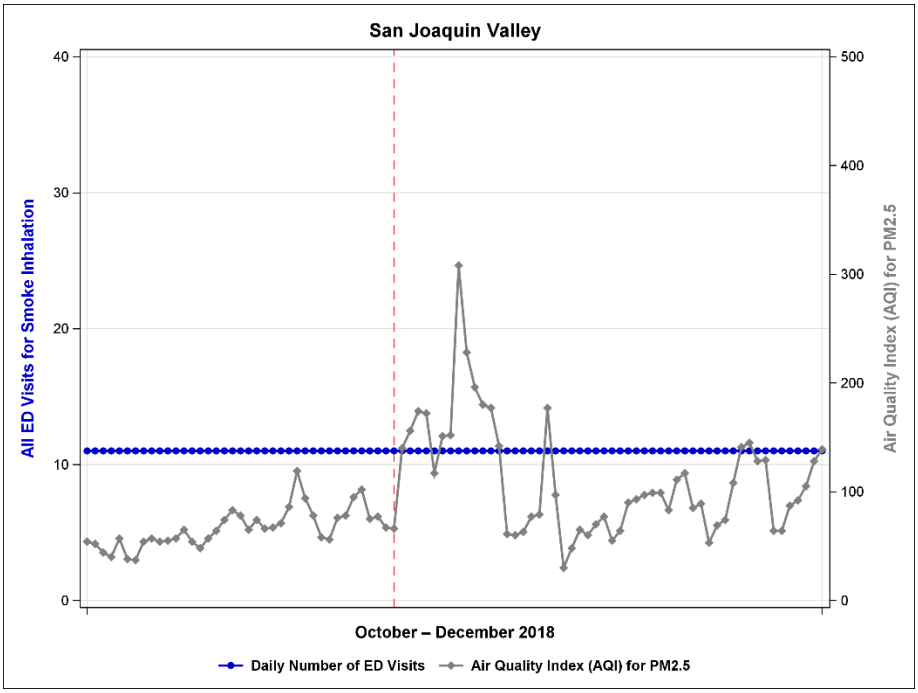
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

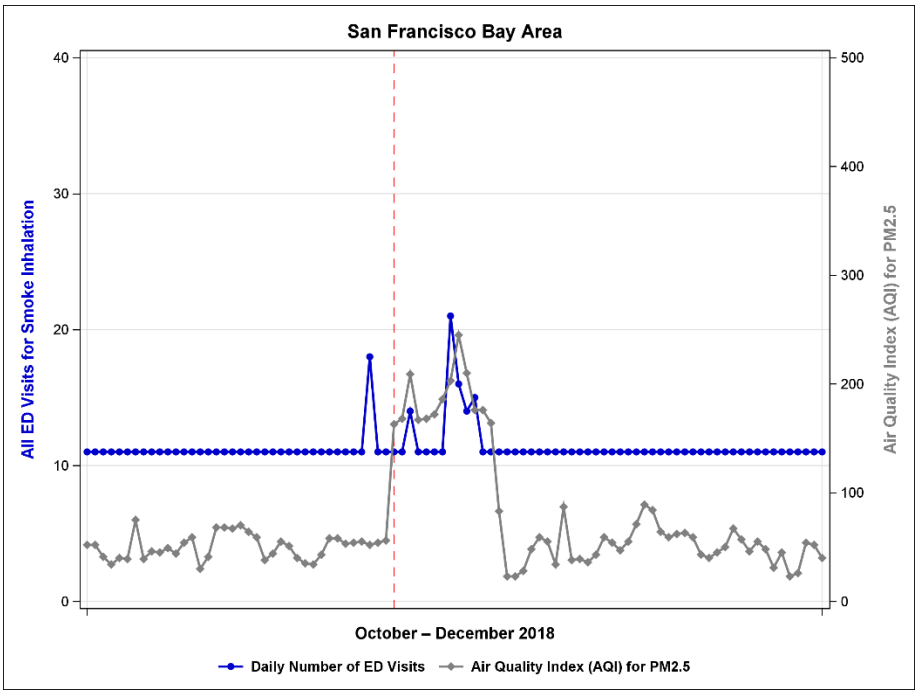
Figure 3c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

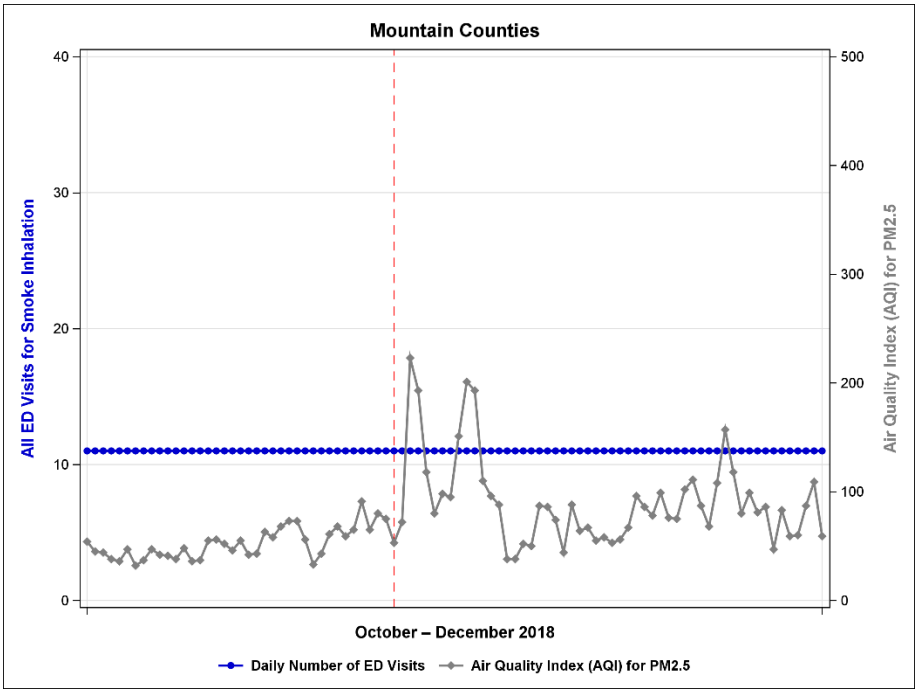
Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November

Figure 3d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, San Francisco Bay Area, California, October–December 2018



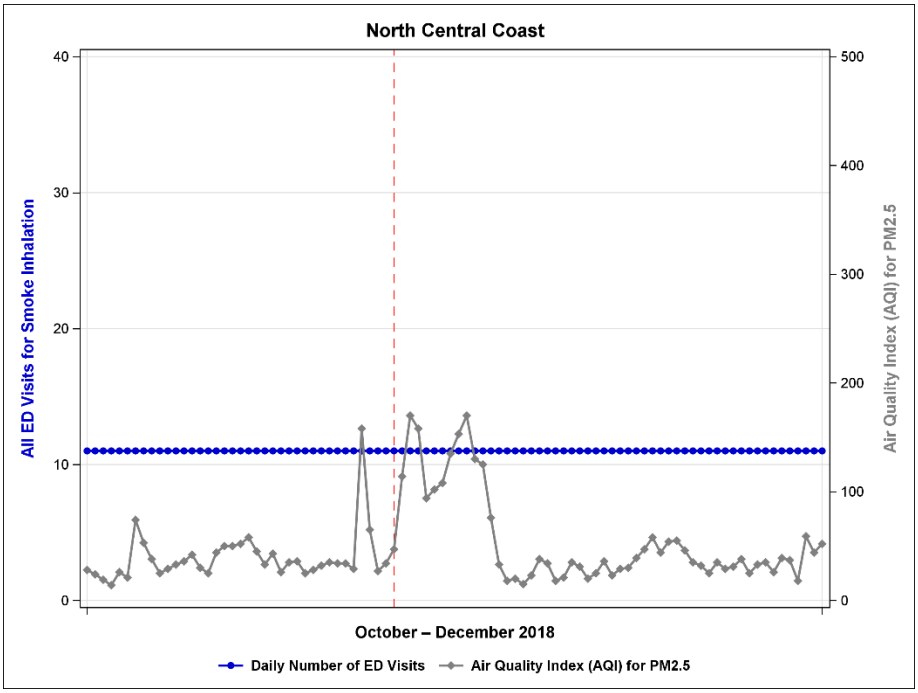
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

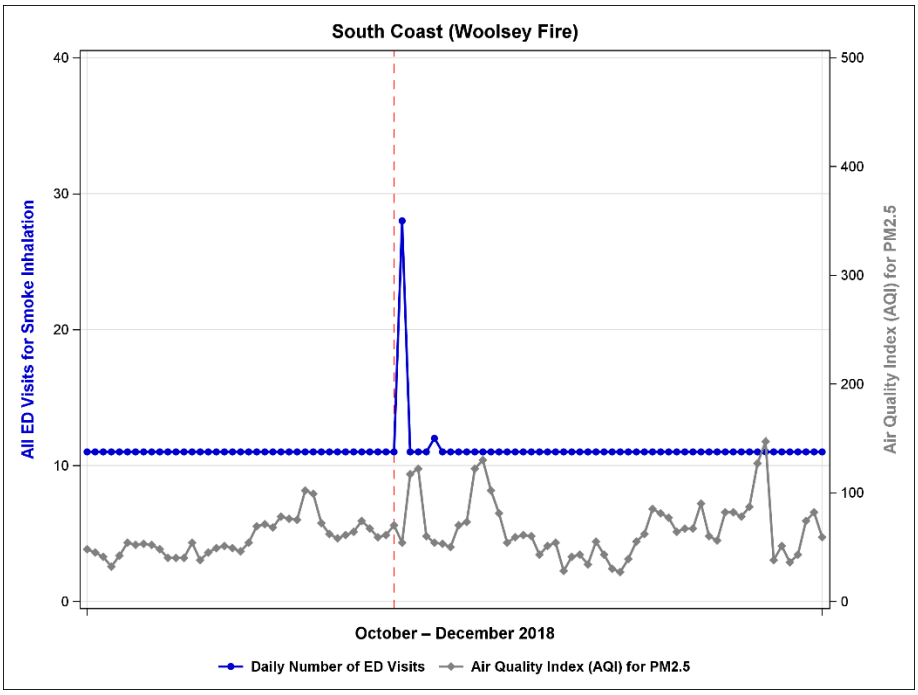
Figure 3f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

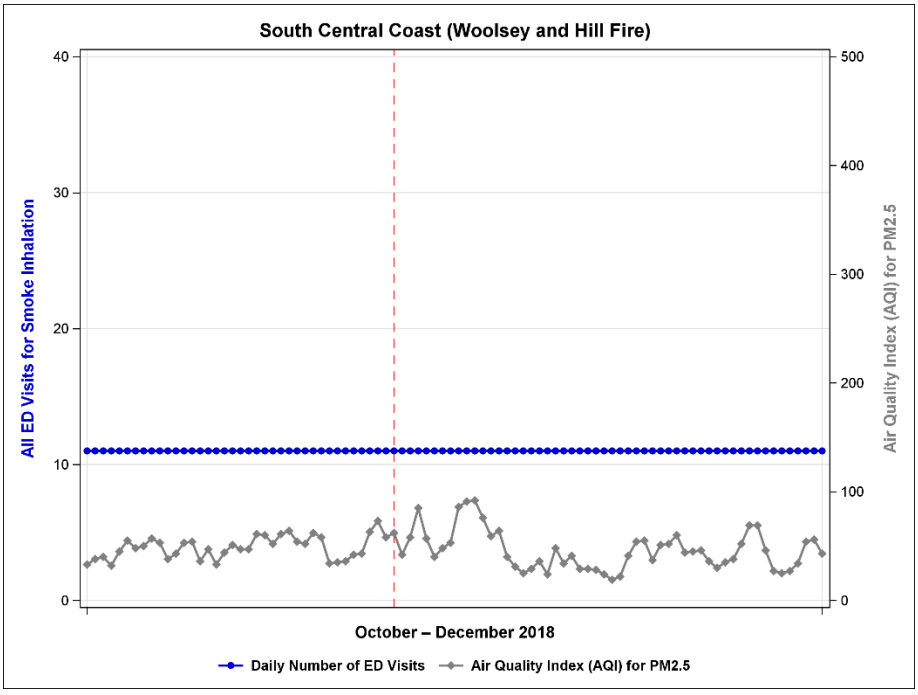
Air Basins with Good to Moderate Air Quality for Most of November

Figure 3g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, South Coast, California, October–December 2018



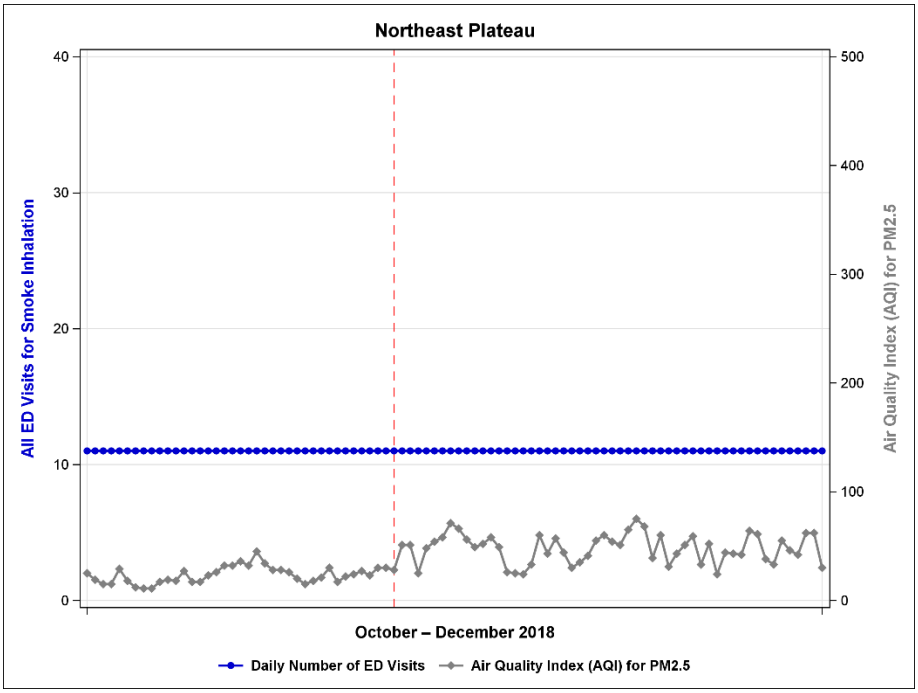
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, South Central Coast, California, October–December 2018



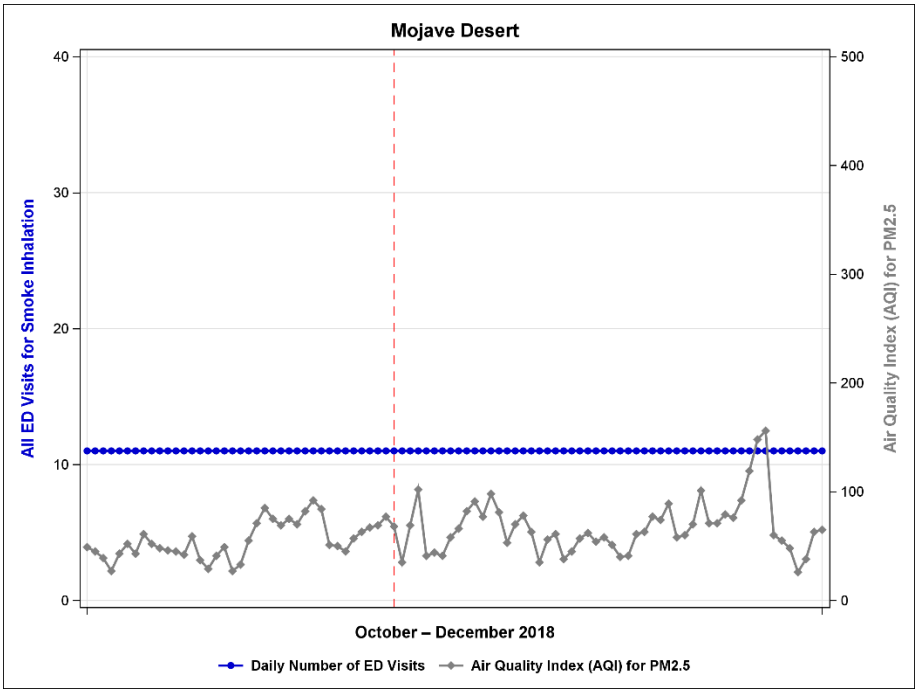
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Northeast Plateau, California, October–December 2018



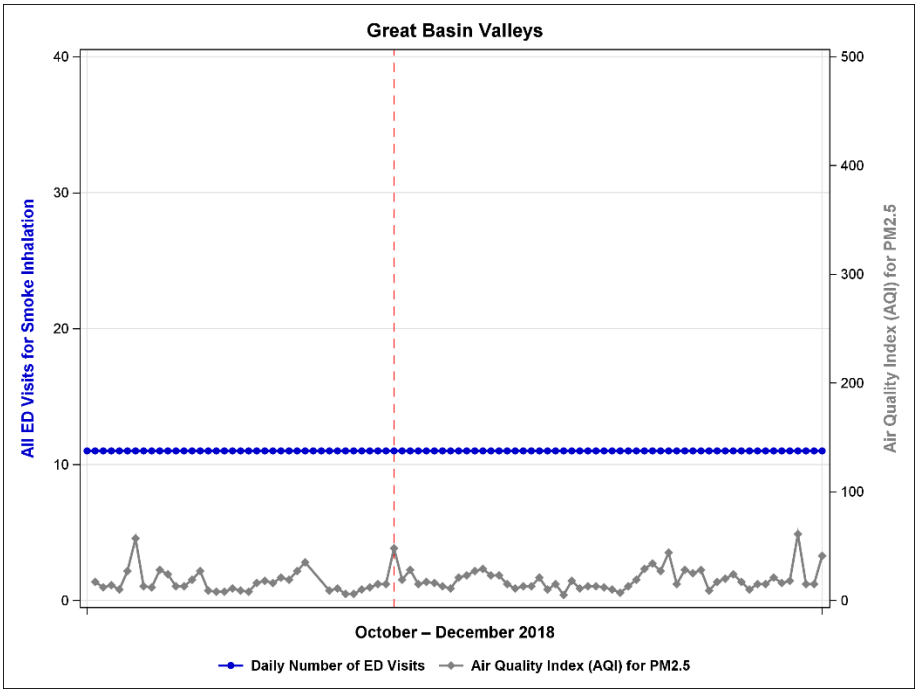
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Mojave Desert, California, October–December 2018



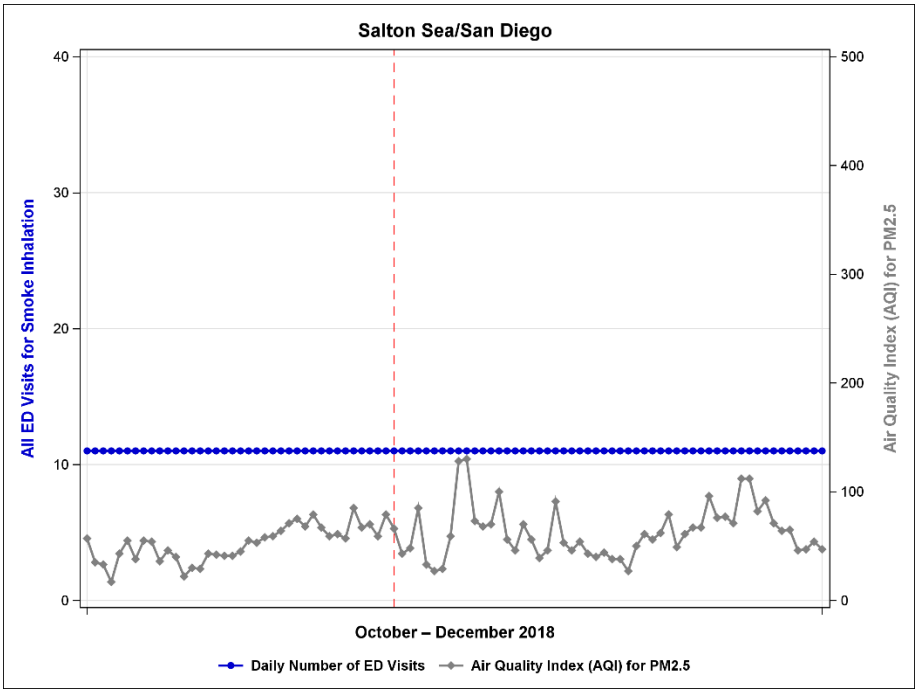
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 3l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Smoke Inhalation, Salton Sea/San Diego, California, October–December 2018



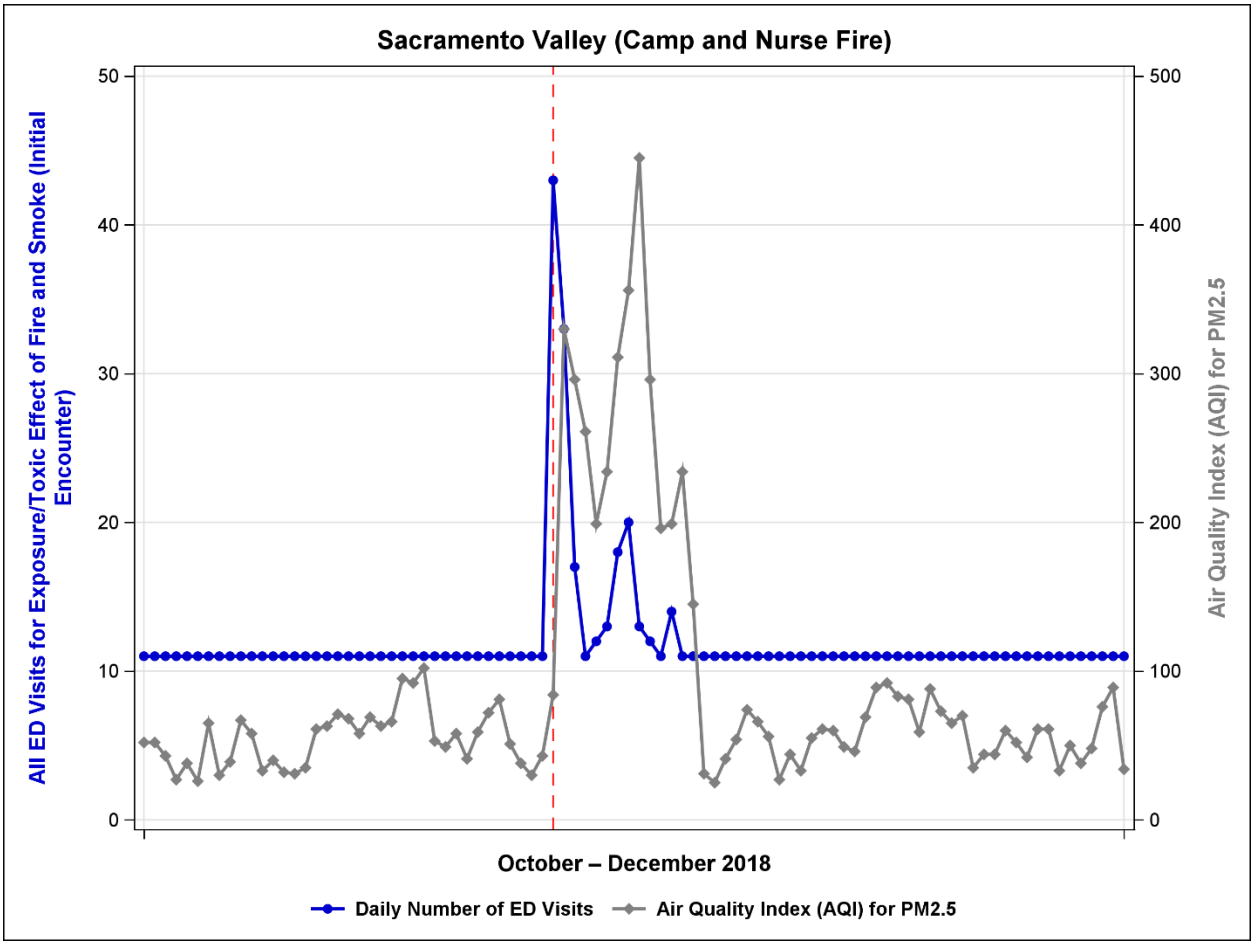
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Initial Encounter for Exposure or Toxic Effect of Fire and Smoke

Figures 4a–4l present ED visits for the initial encounter of exposure or toxic effect of fire and smoke. The maximum for the y-axis indicating ED visits is set to 50 for all figures.

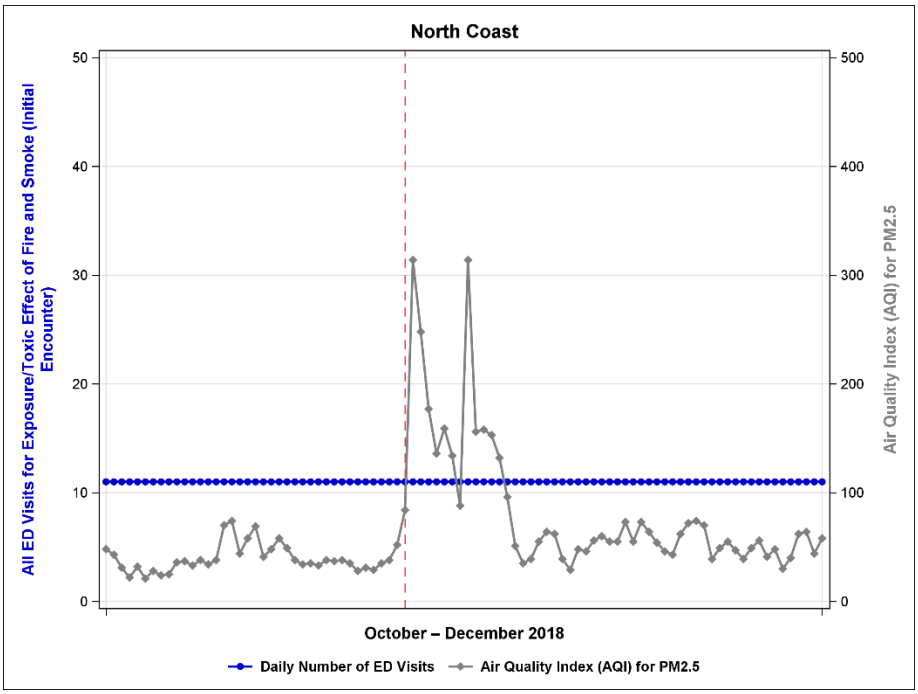
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 4a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Sacramento Valley, California, October–December 2018



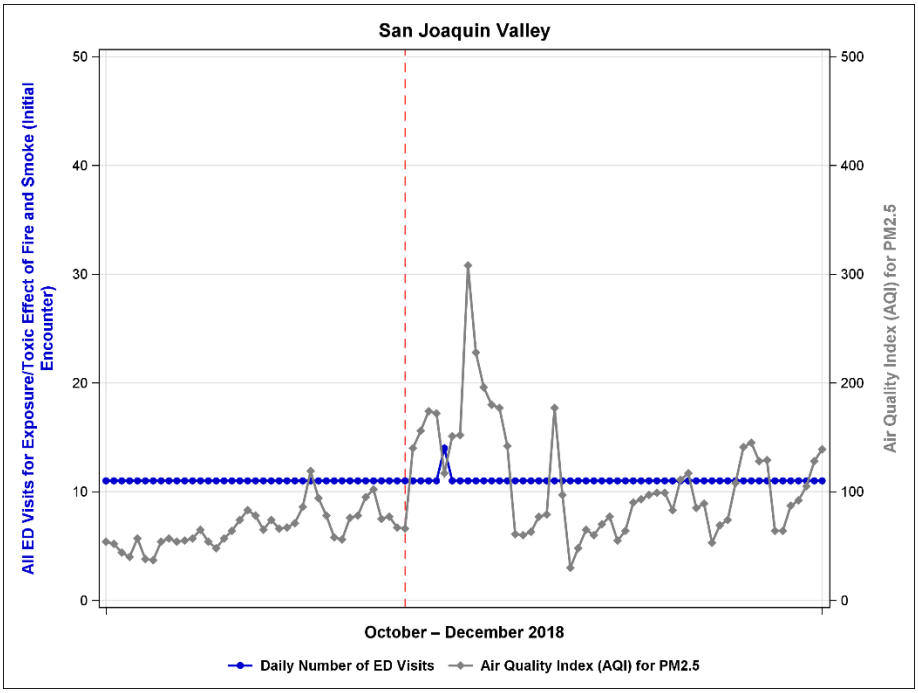
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

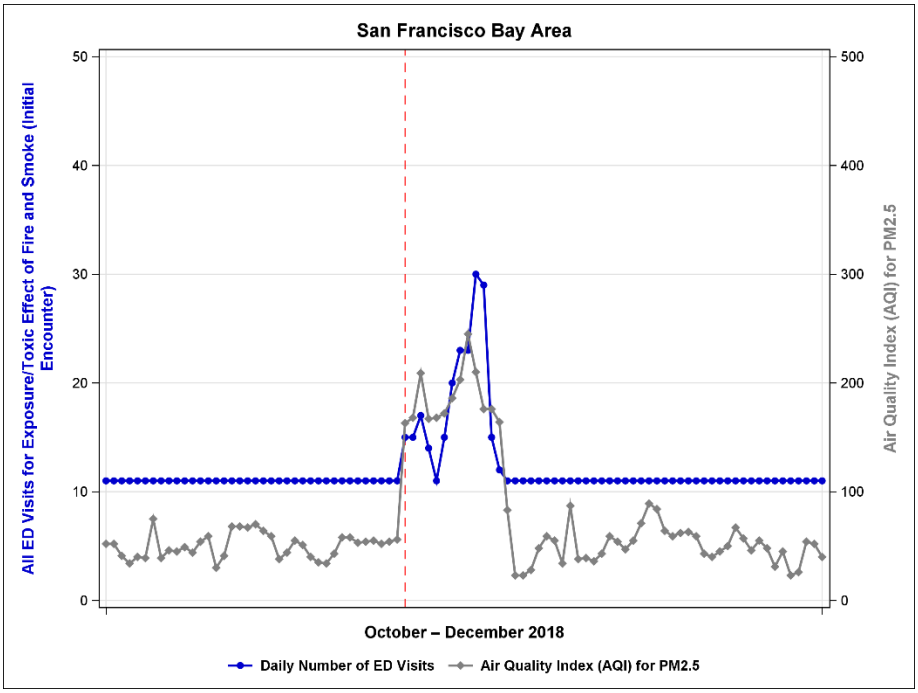
Figure 4c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

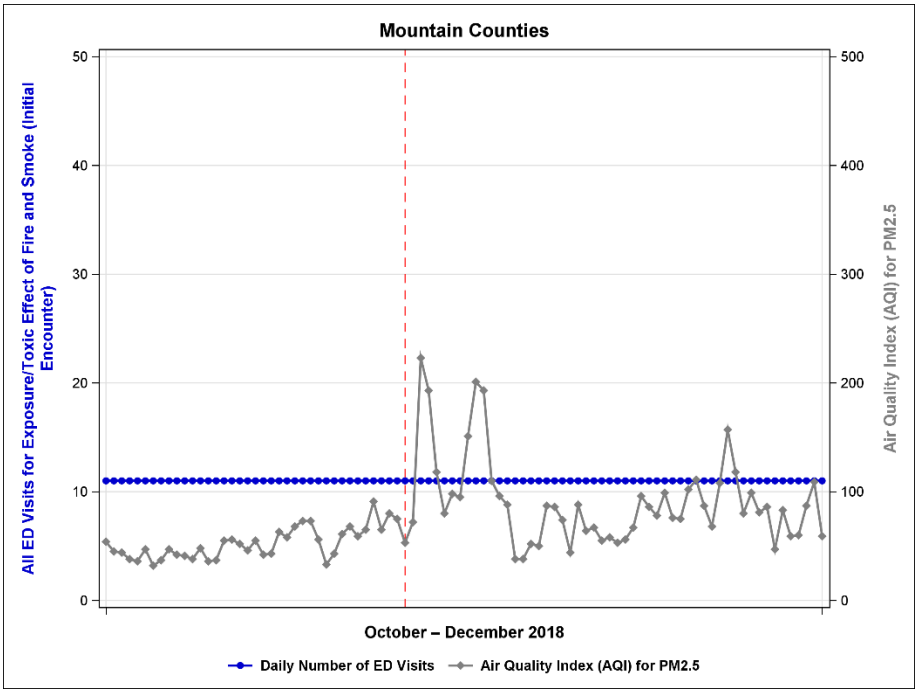
Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November

Figure 4d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, San Francisco Bay Area, California, October–December 2018



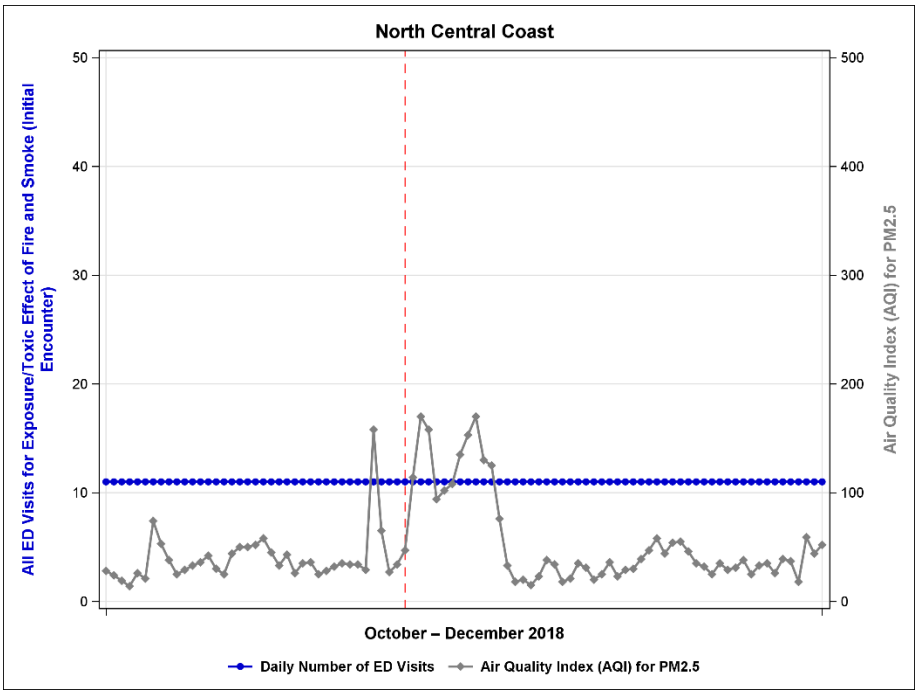
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

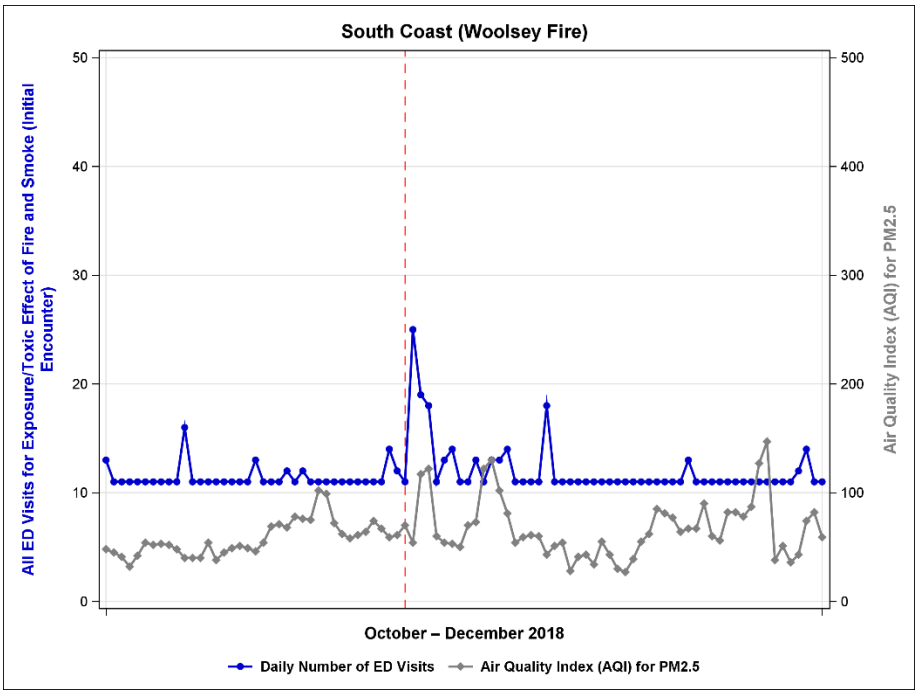
Figure 4f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

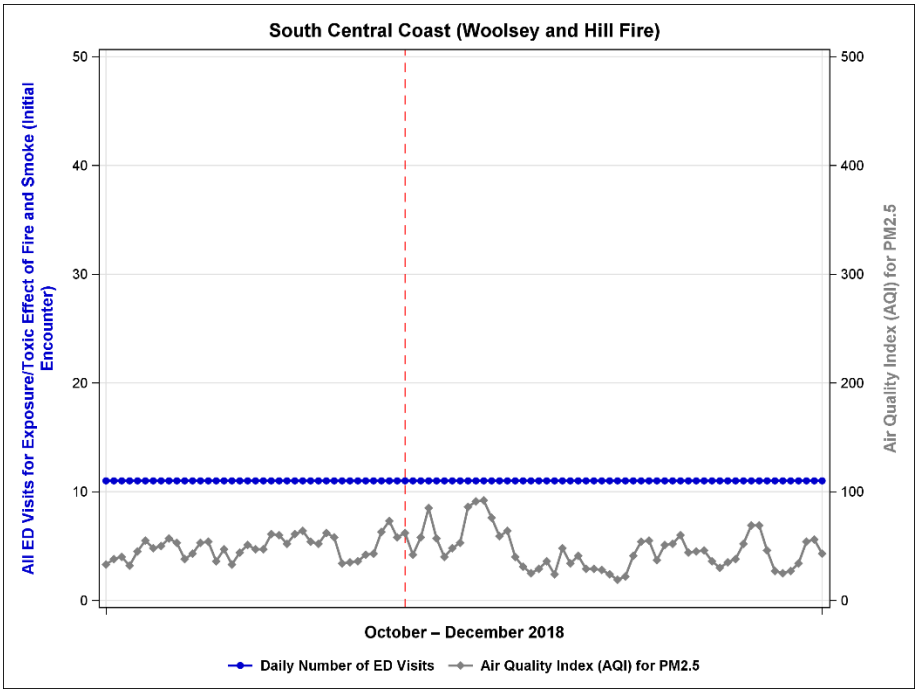
Air Basins with Good to Moderate Air Quality for Most of November

Figure 4g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, South Coast, California, October–December 2018



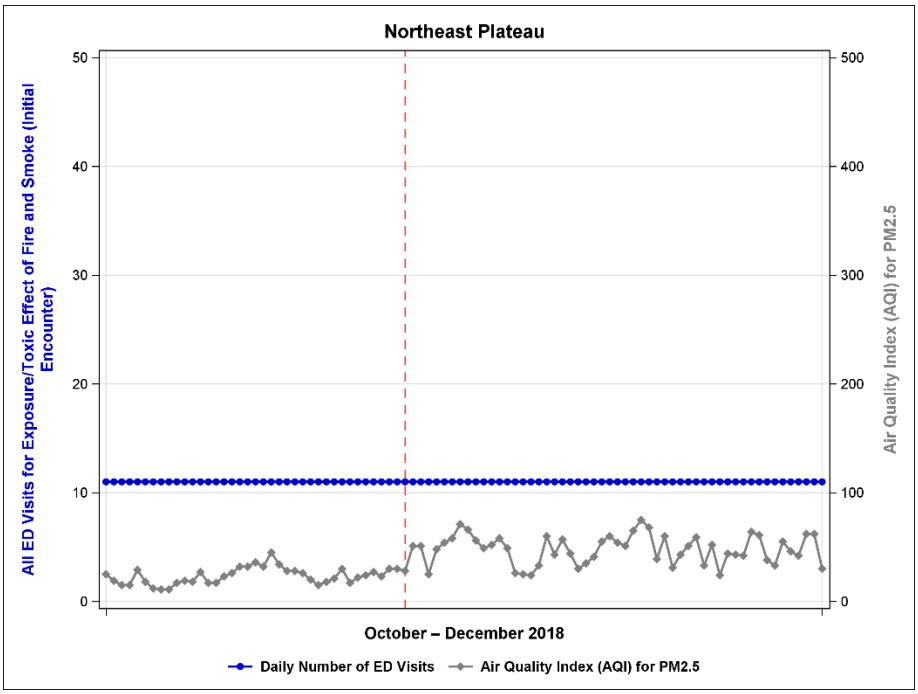
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, South Central Coast, California, October–December 2018



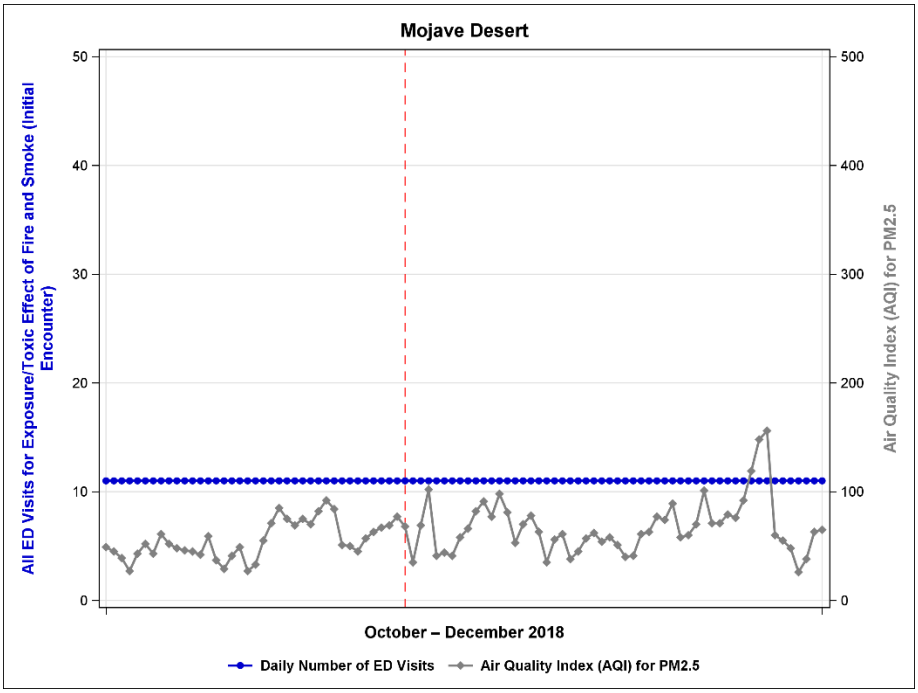
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Northeast Plateau, California, October–December 2018



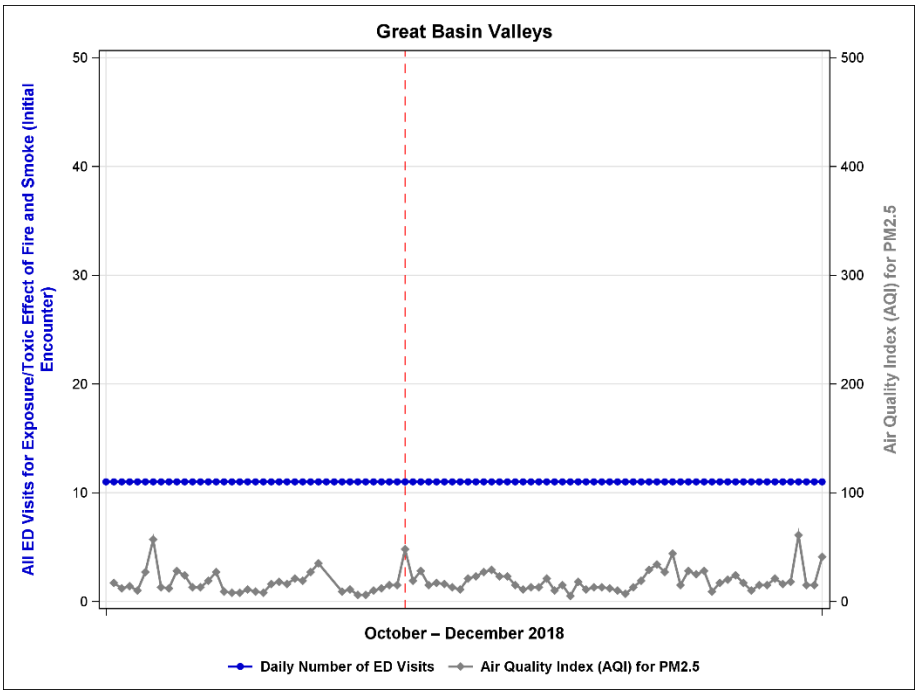
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Mojave Desert, California, October–December 2018



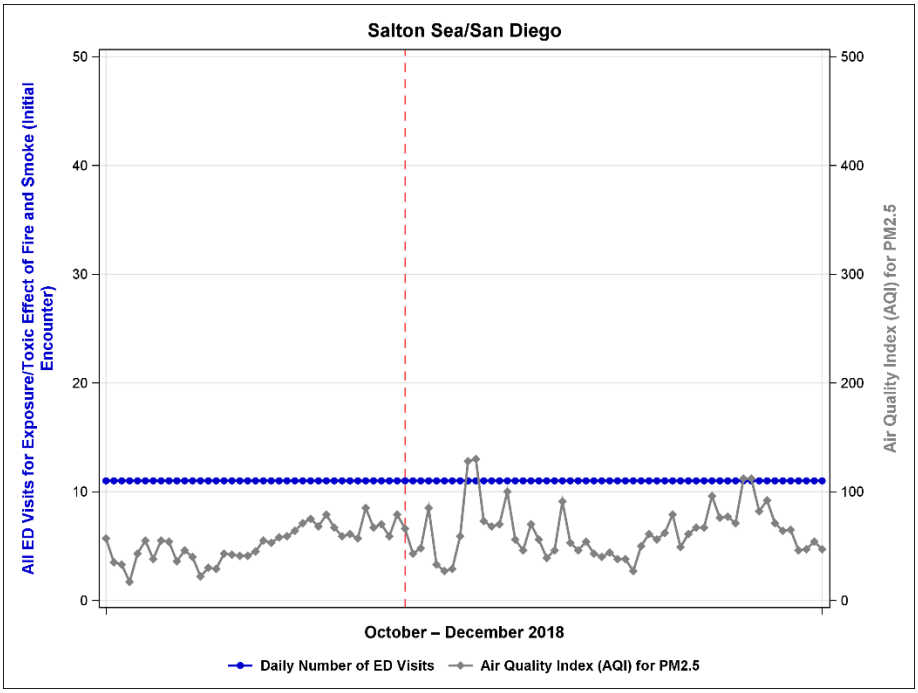
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 4l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Exposure/Toxic Effect of Fire/Smoke, Salton Sea/San Diego, California, October–December 2018



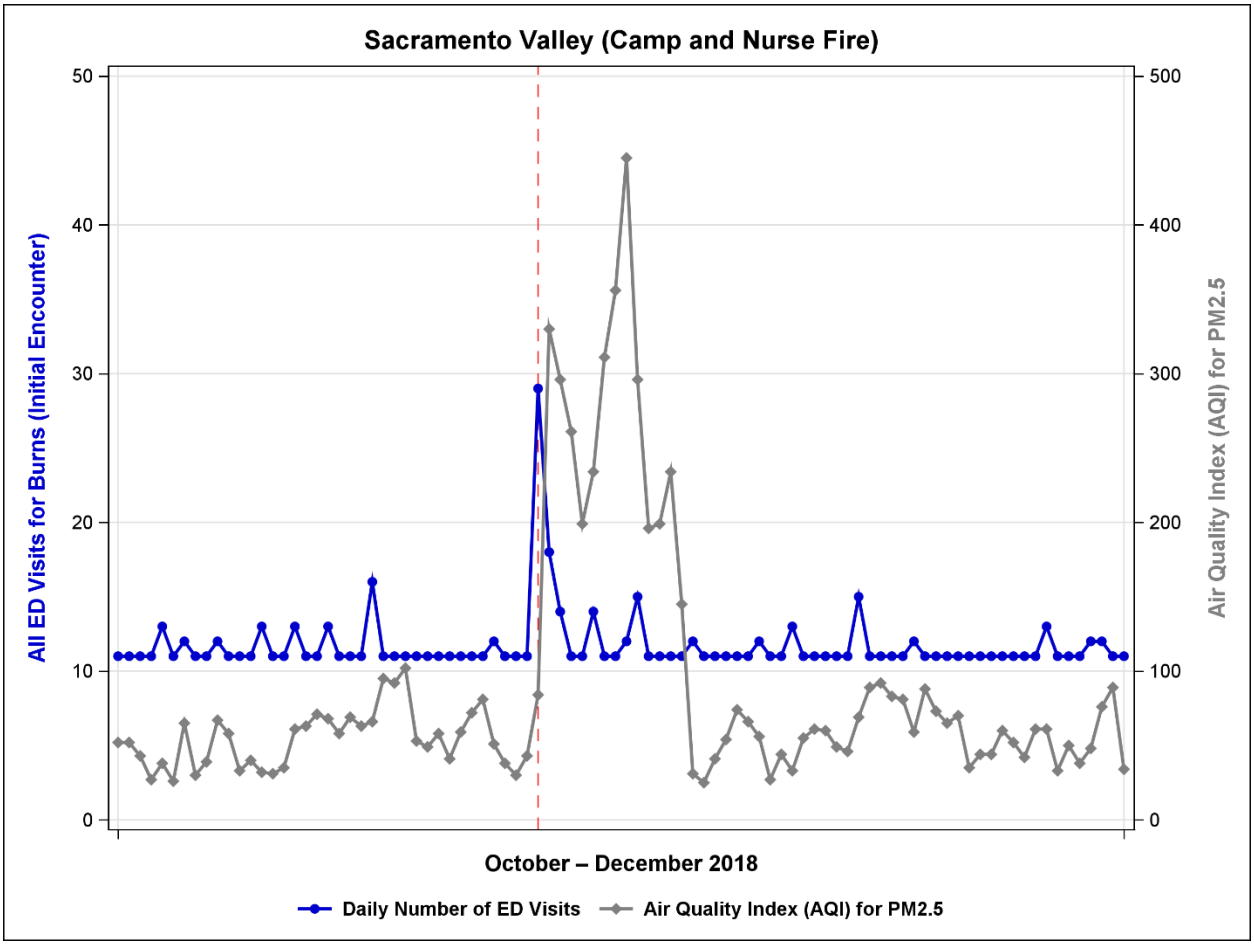
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Initial Encounter for Burns (Including but not Limited to Fire Burns)

Figures 5a–5l present ED visits for the initial encounter of burns (including but not limited to fire burns). The maximum for the y-axis indicating ED visits is set to 50 for all figures.

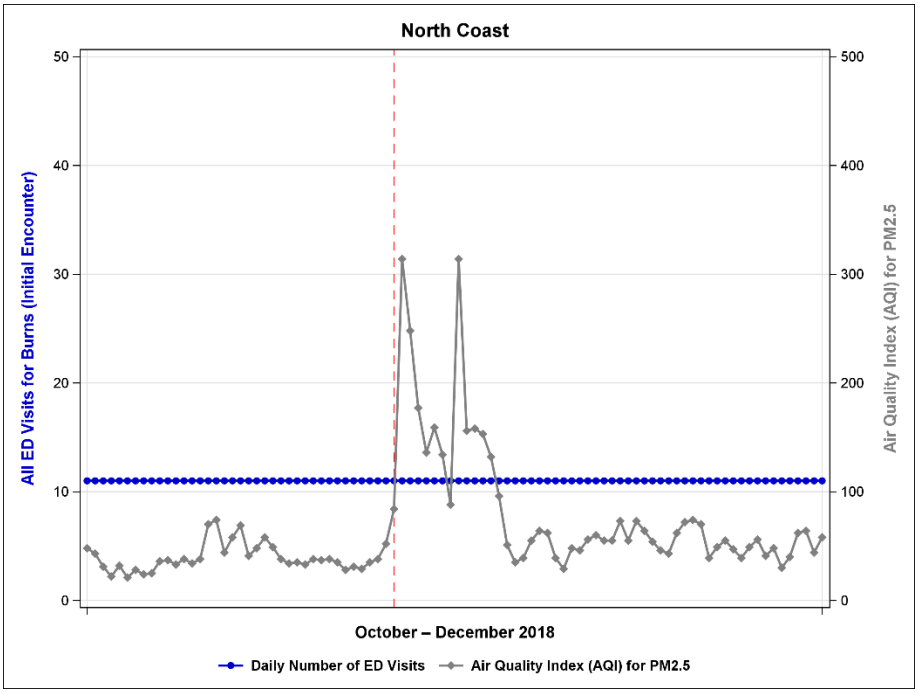
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 5a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Sacramento Valley, California, October–December 2018



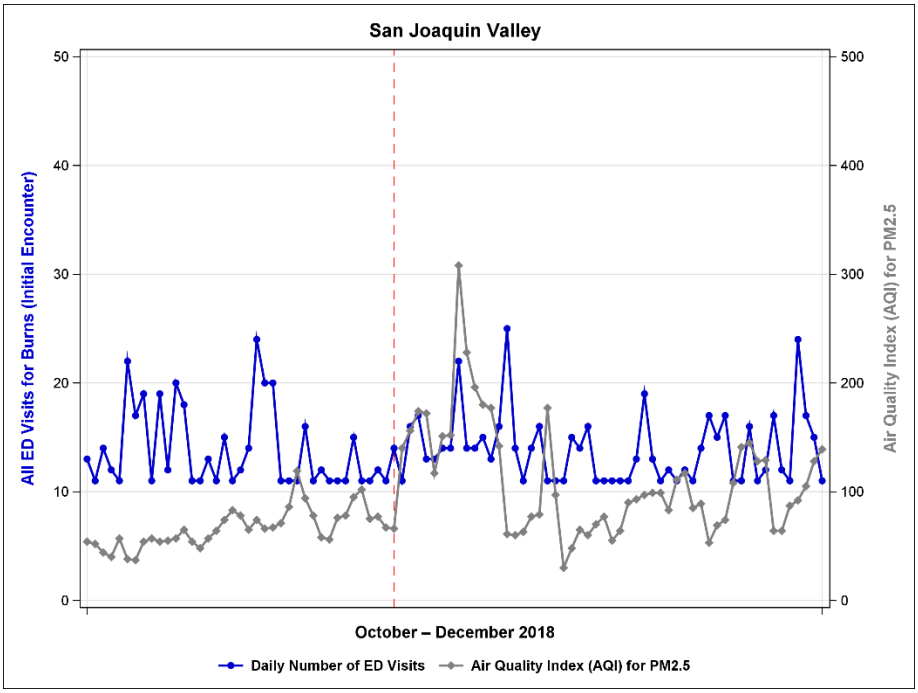
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

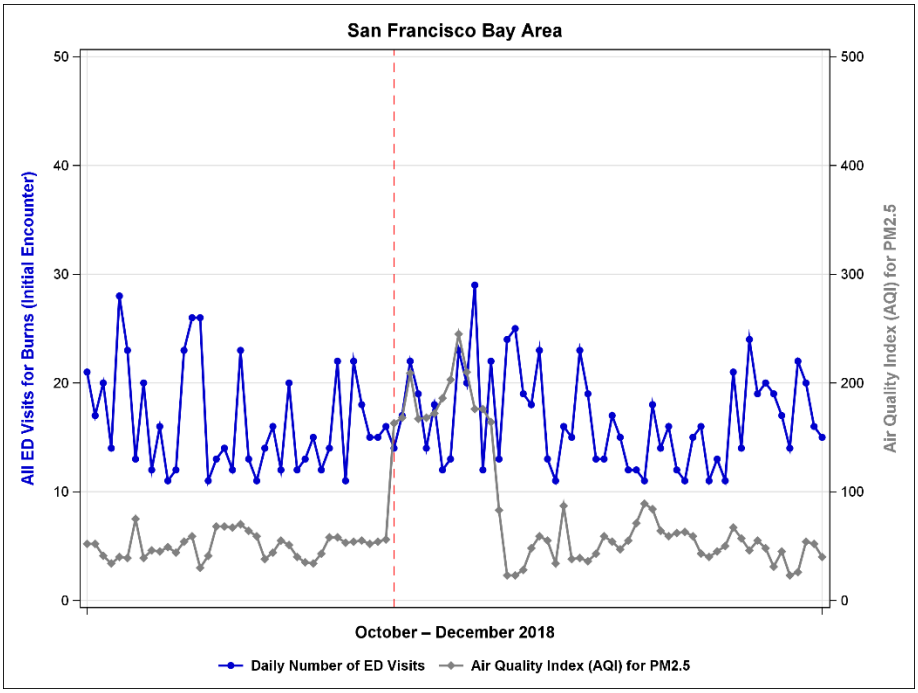
Figure 5c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

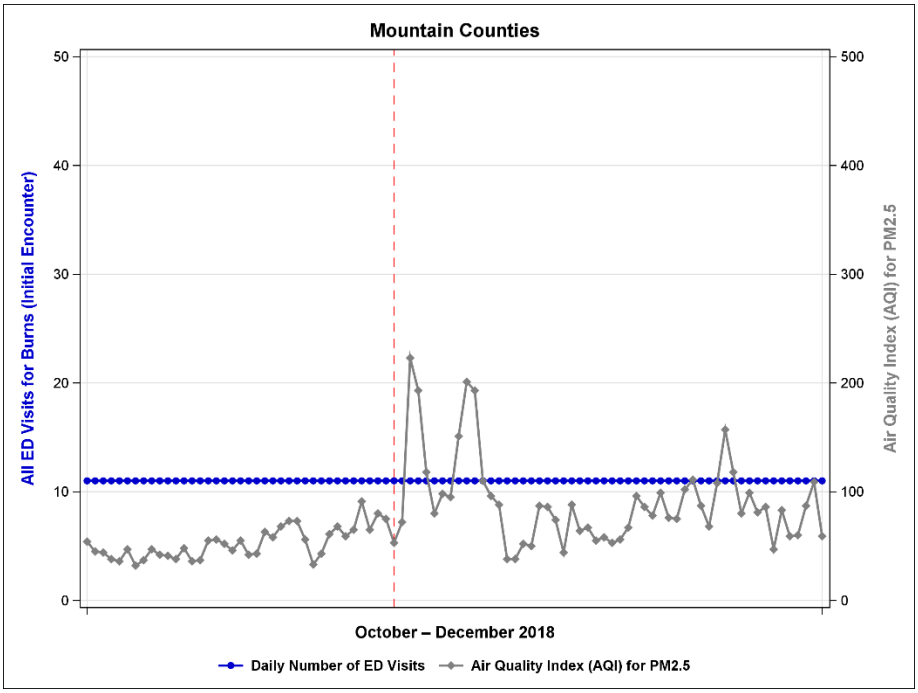
[Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November]

Figure 5d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, San Francisco Bay Area, California, October–December 2018



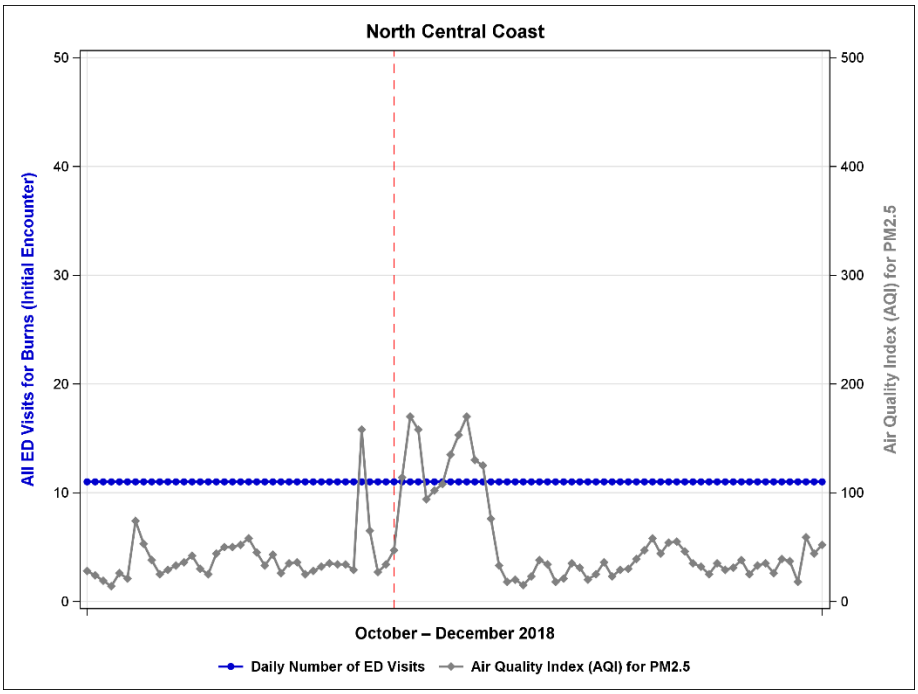
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

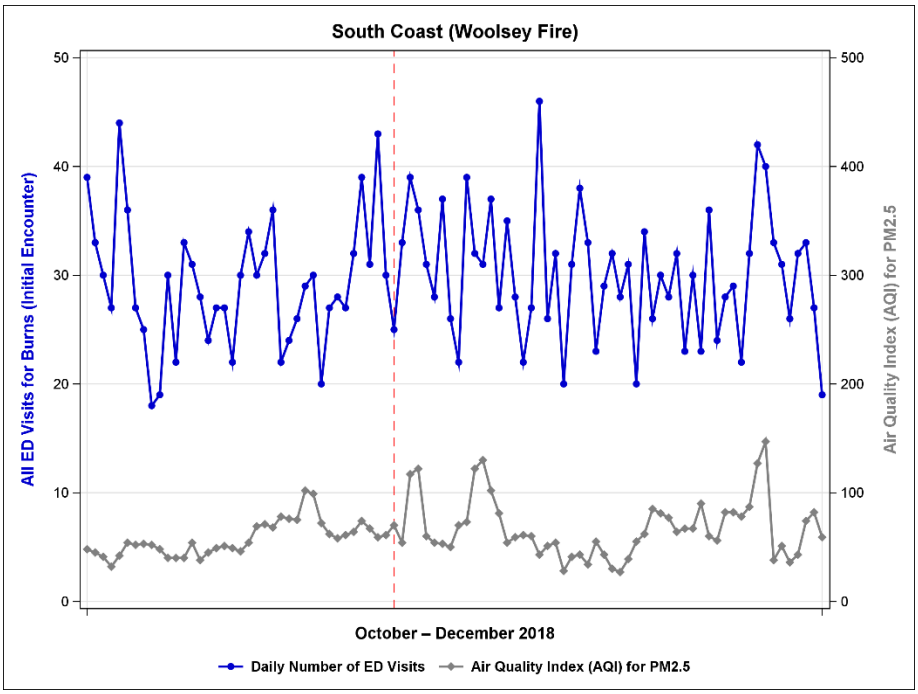
Figure 5f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

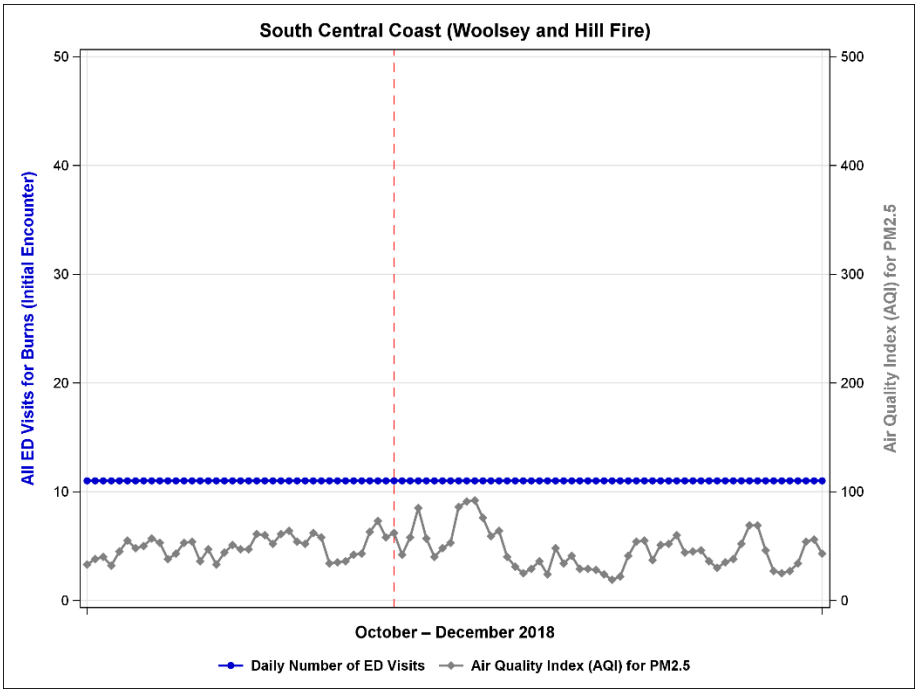
Air Basins with Good to Moderate Air Quality for Most of November

Figure 5g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, South Coast, California, October–December 2018



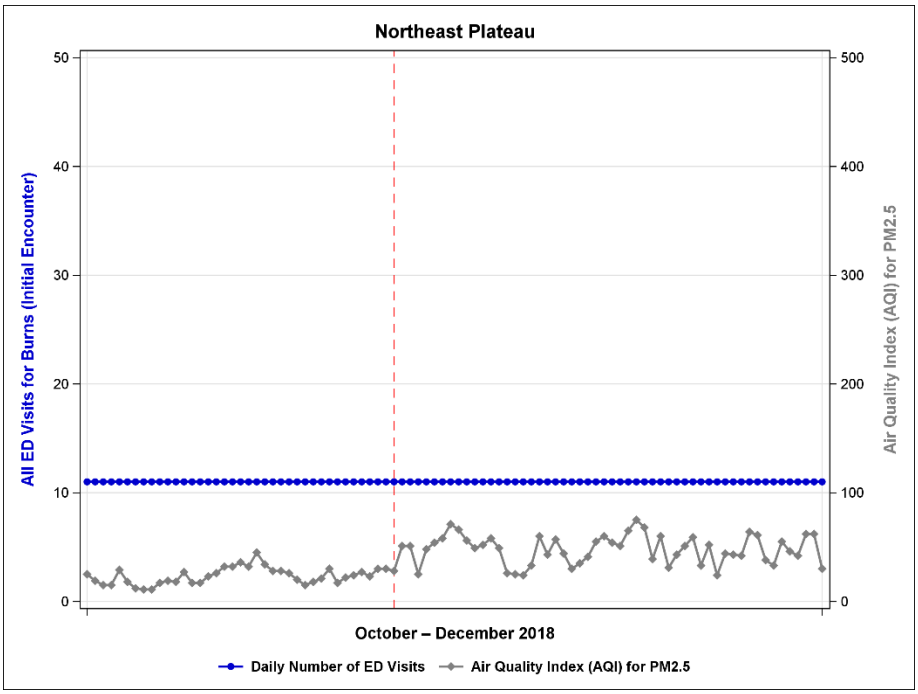
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, South Central Coast, California, October–December 2018



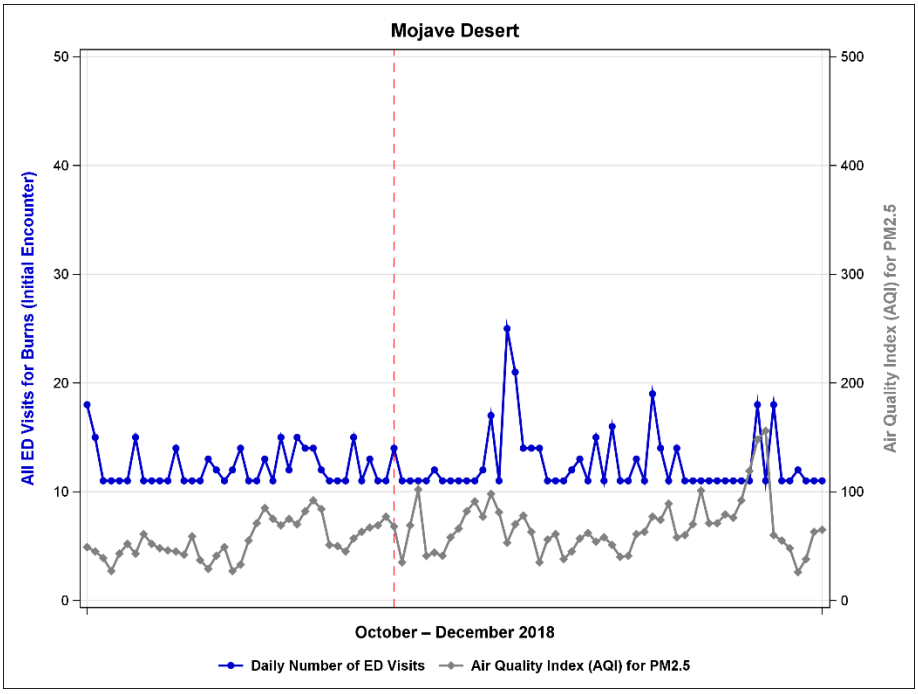
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Northeast Plateau, California, October–December 2018



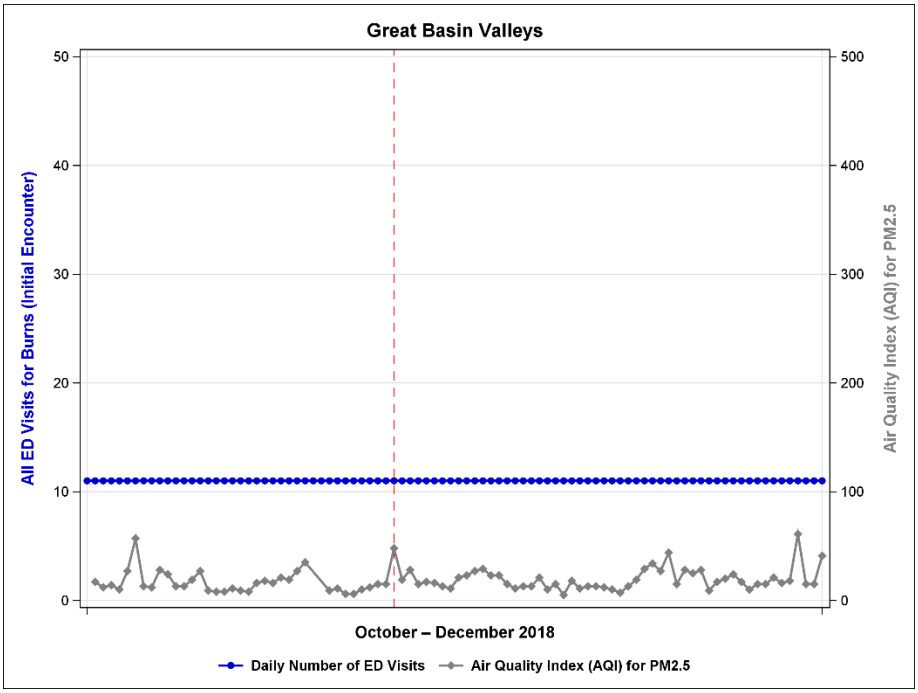
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Mojave Desert, California, October–December 2018



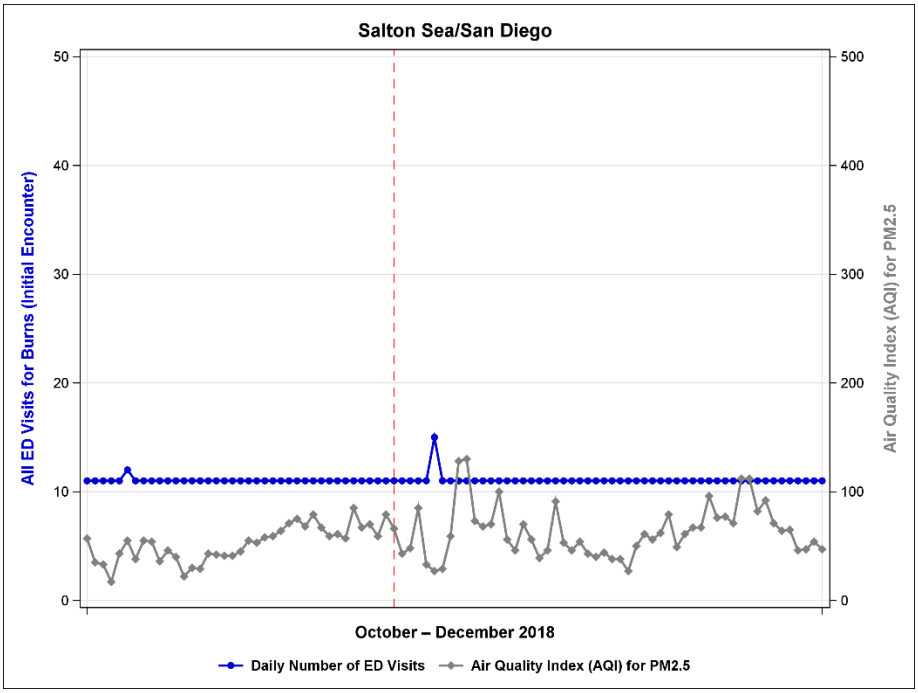
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 5l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Burns, Salton Sea/San Diego, California, October–December 2018



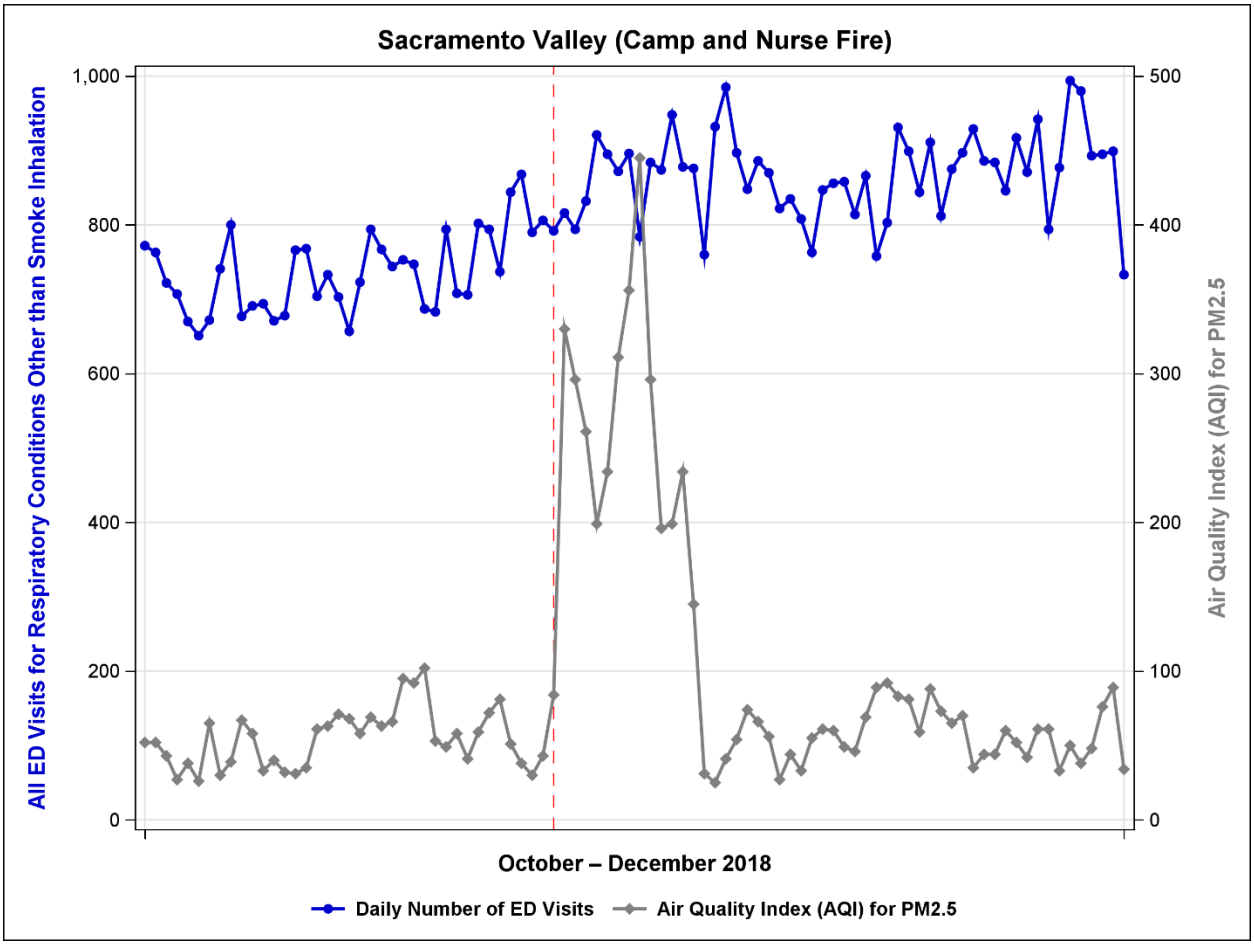
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Respiratory Conditions Other than Smoke Inhalation

Figures 6a–6l present ED visits for all respiratory conditions except for smoke inhalation. The maximum for the y-axis indicating ED visits is set to 1,000 for all figures except the more populous air basins (South Coast, San Francisco Bay Area, San Joaquin Valley, and the Mojave Desert) which have the y-axis set to 3,000.

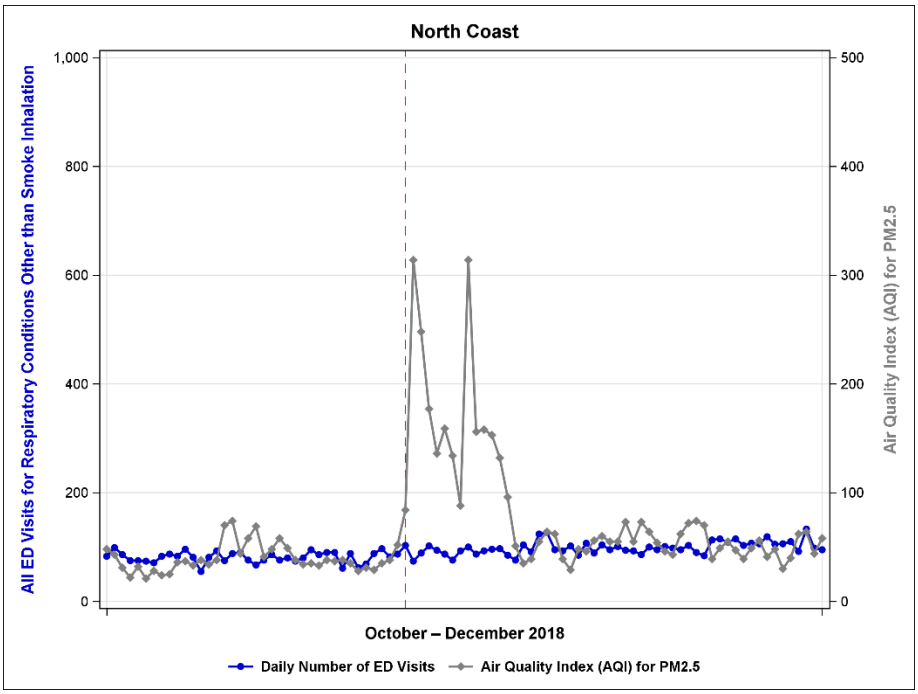
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 6a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Sacramento Valley, California, October–December 2018



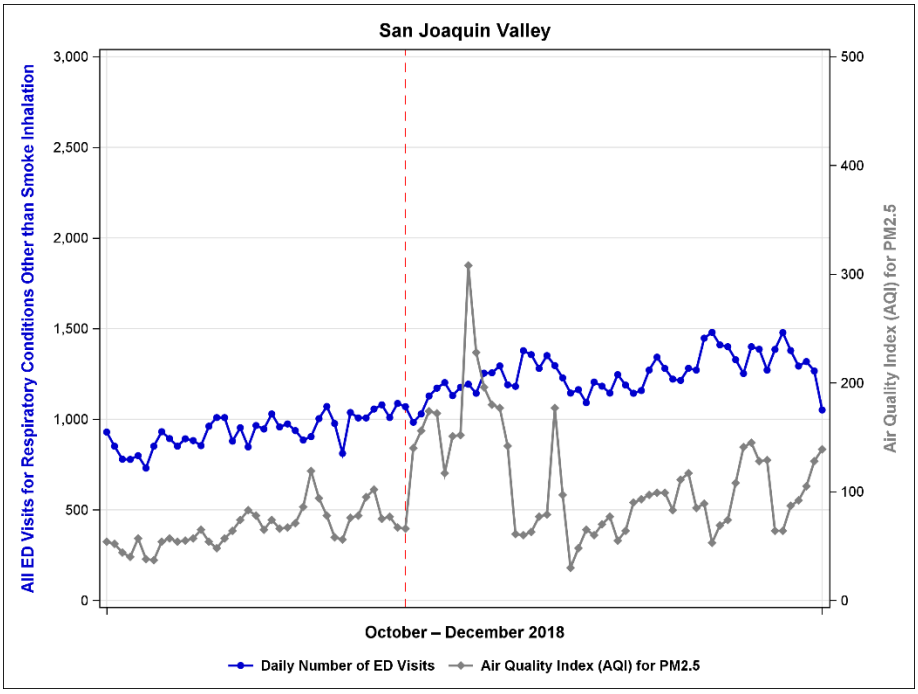
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

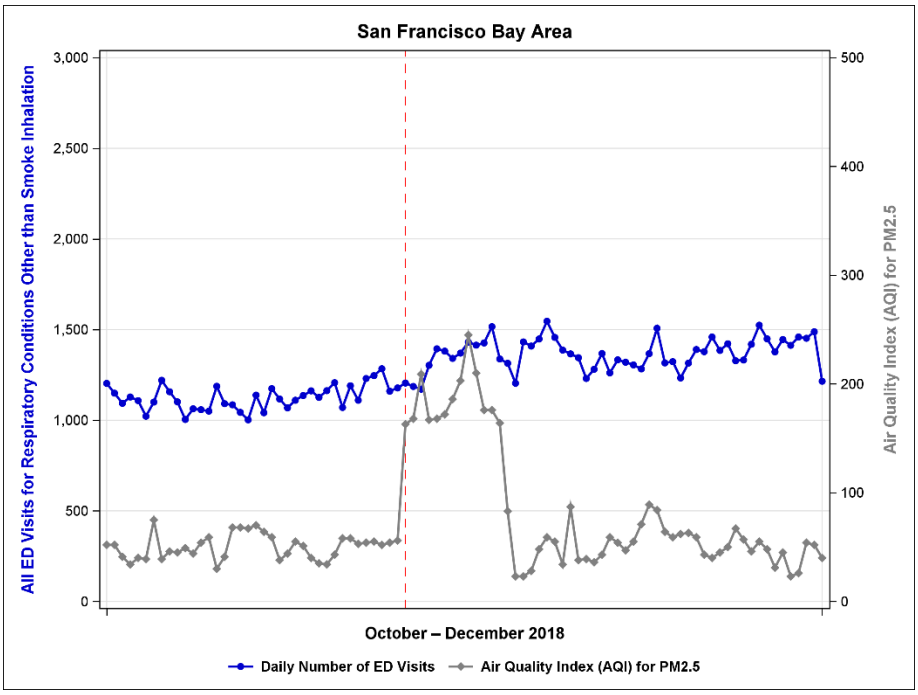
Figure 6c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

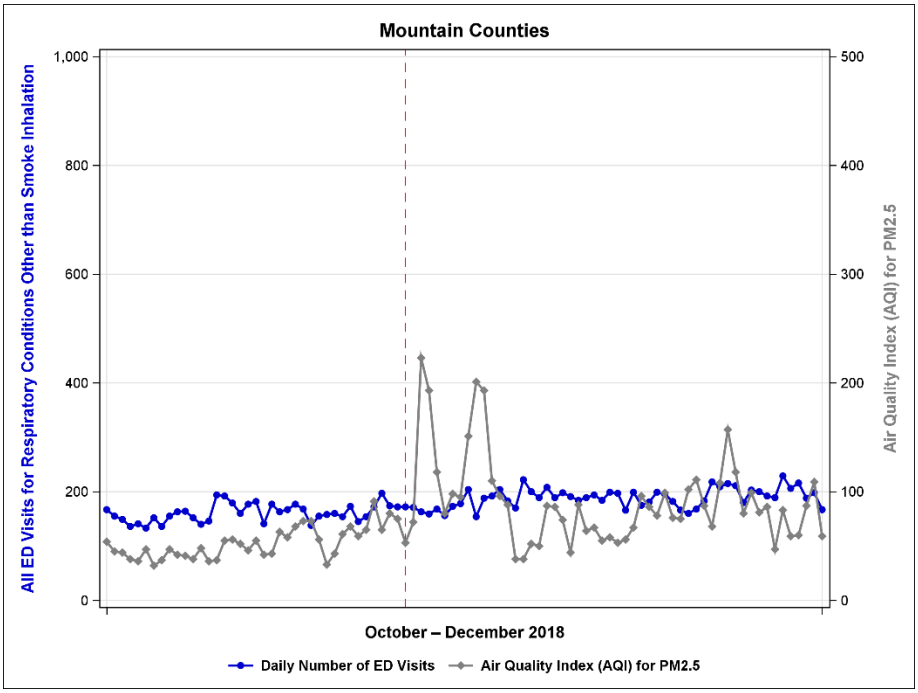
[Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November]

Figure 6d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), San Francisco Bay Area, California, October–December 2018



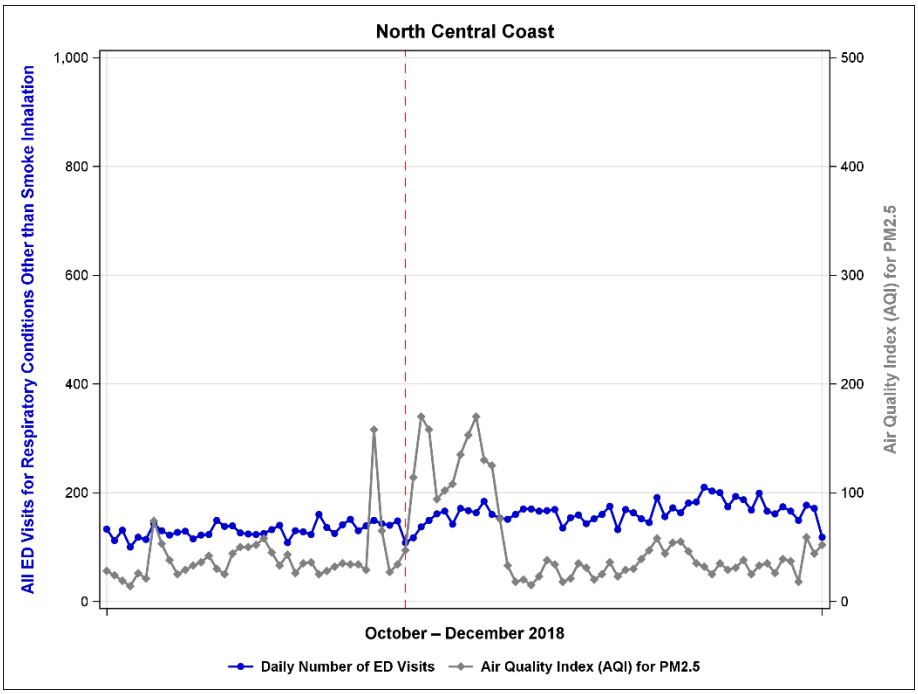
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

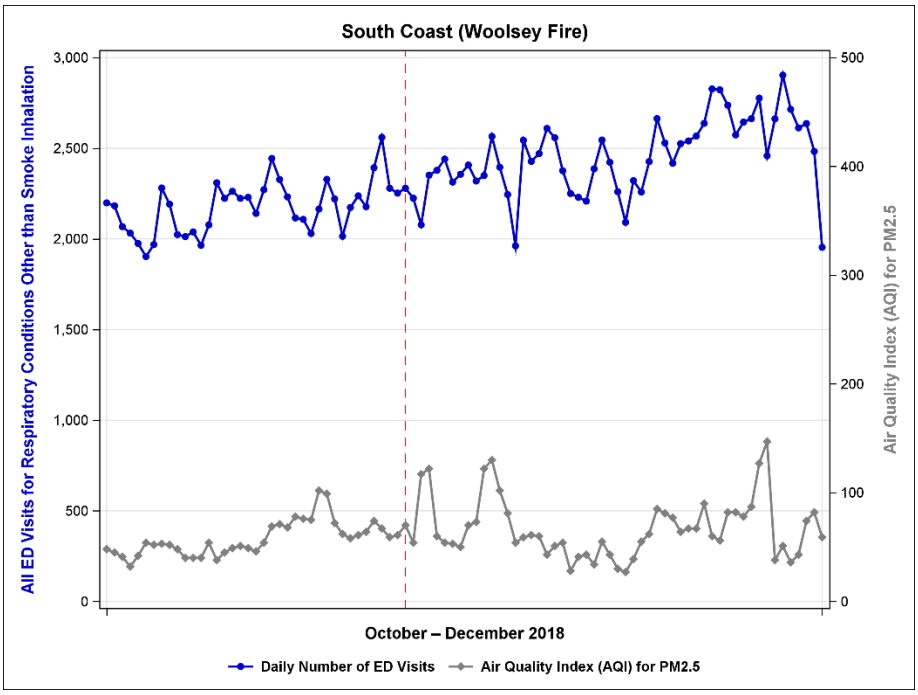
Figure 6f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

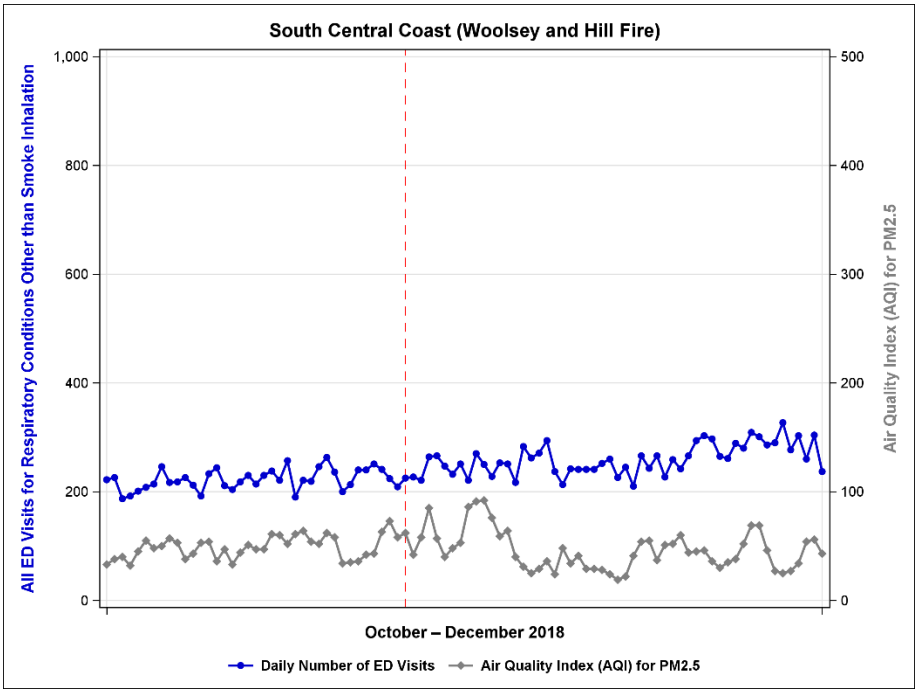
Air Basins with Good to Moderate Air Quality for Most of November

Figure 6g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), South Coast, California, October–December 2018



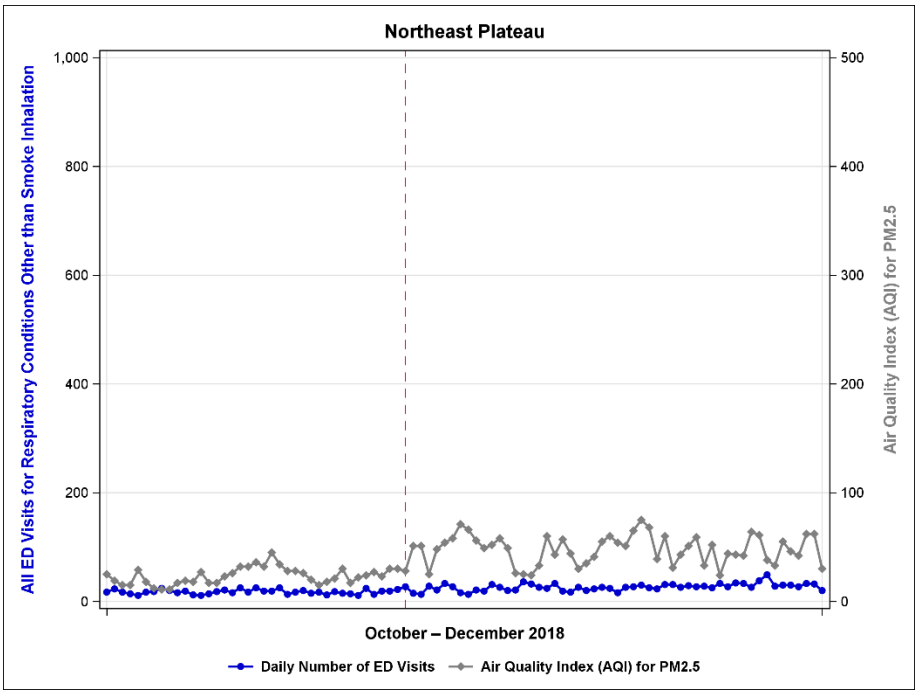
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), South Central Coast, California, October–December 2018



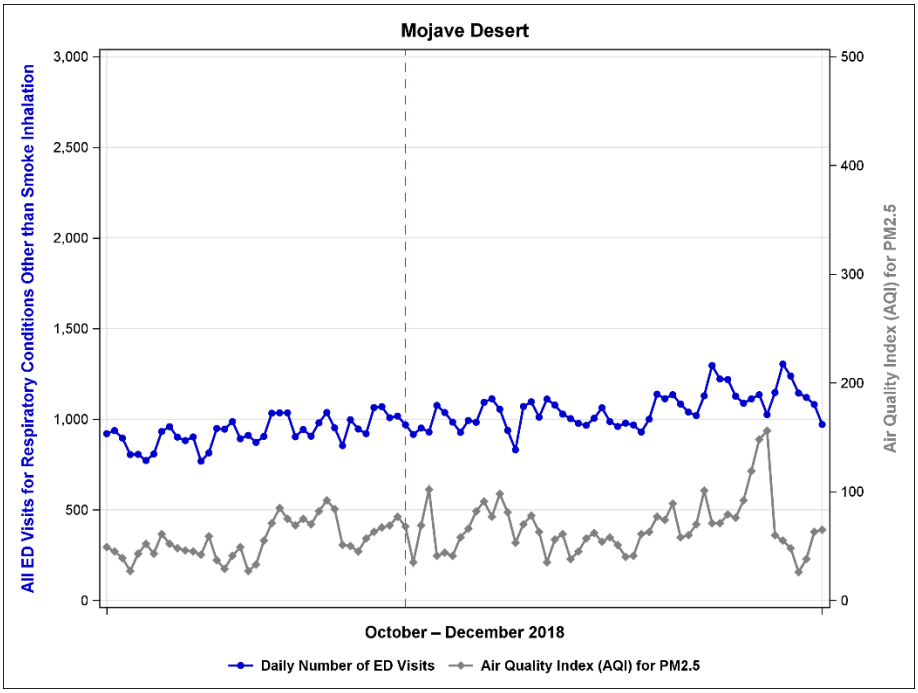
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Northeast Plateau, California, October–December 2018



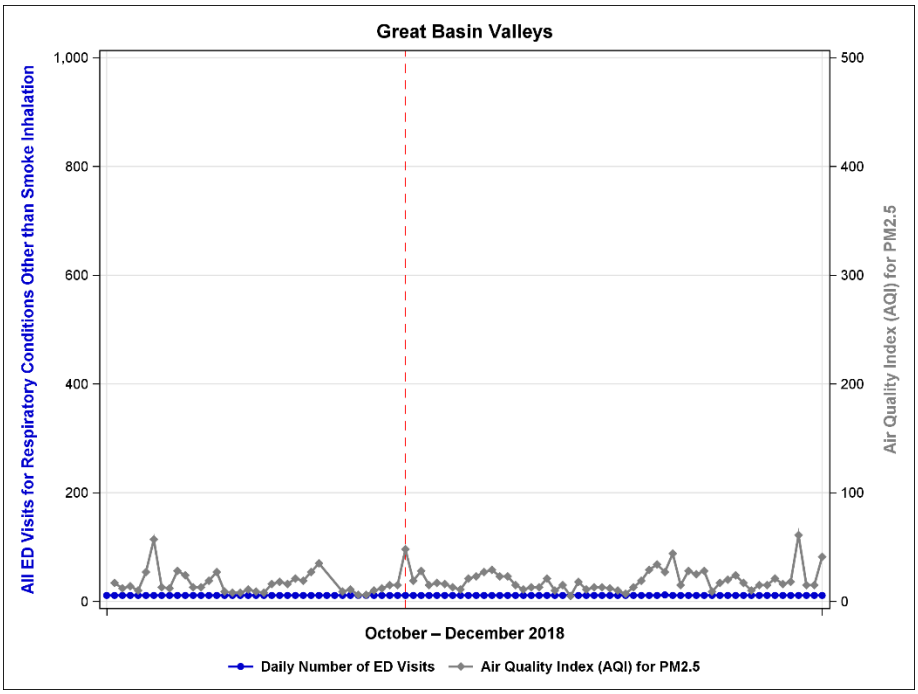
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Mojave Desert, California, October–December 2018



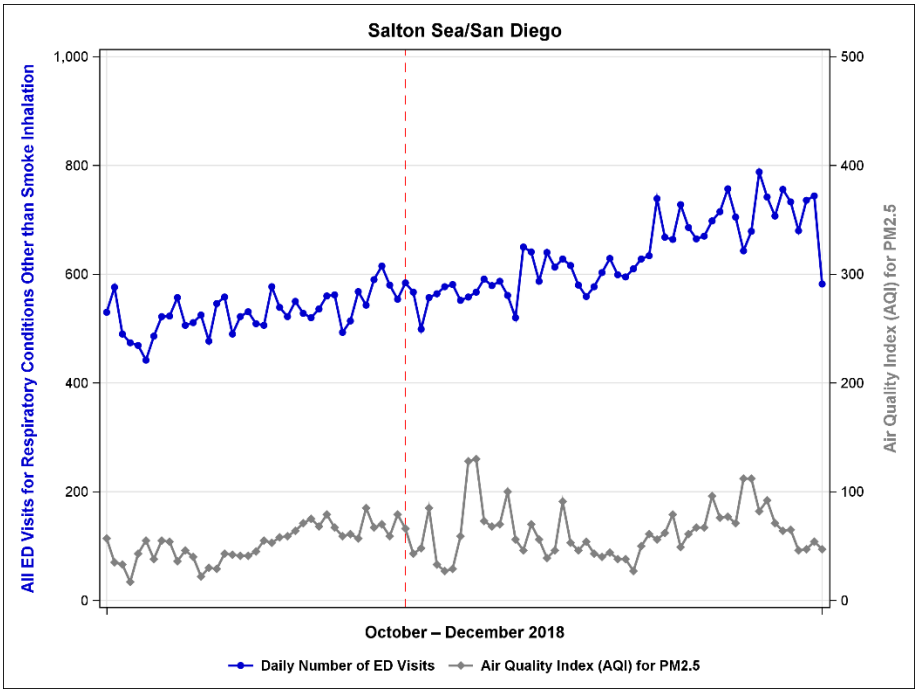
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 6l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Respiratory Conditions (Other than Smoke Inhalation), Salton Sea/San Diego, California, October–December 2018



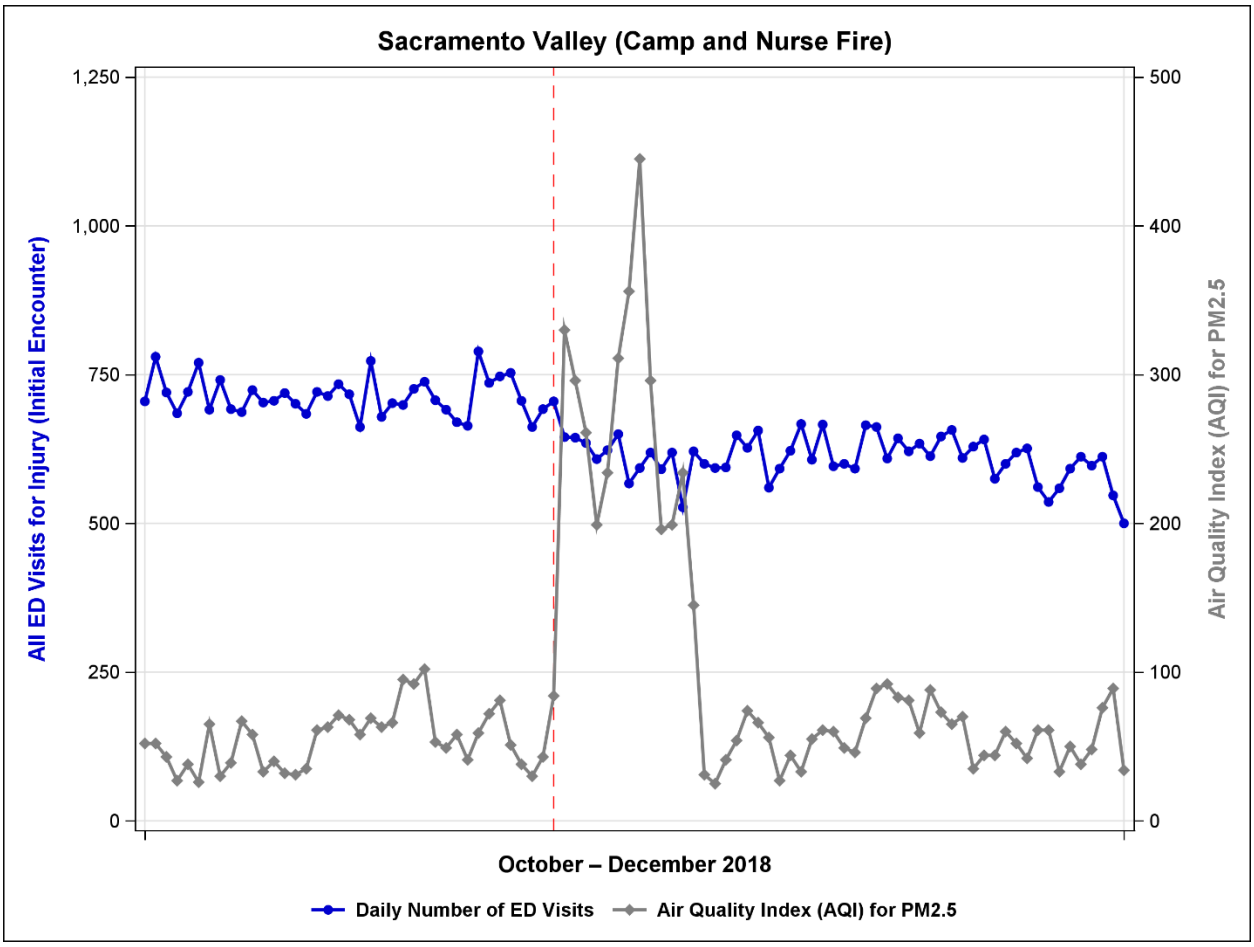
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Initial Encounter for Injury (Including Burns)

Figures 7a–7l present ED visits for the initial encounter of injuries (including burns). The maximum for the y-axis indicating ED visits is set to 1,200 for all figures except the more populous air basins (South Coast and San Francisco Bay Area) which have the y-axis set to 3,000.

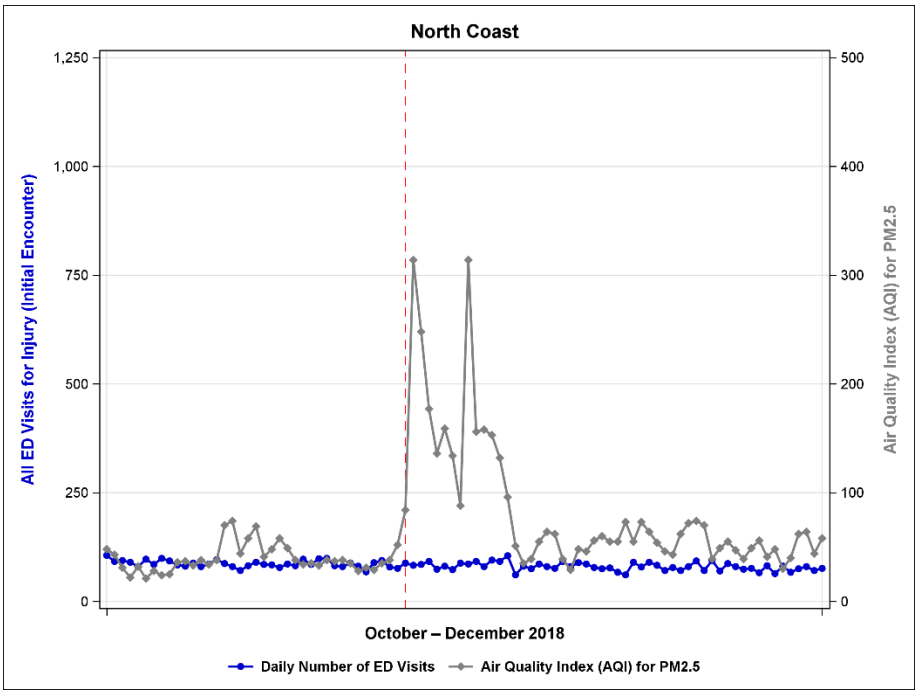
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 7a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Sacramento Valley, California, October–December 2018



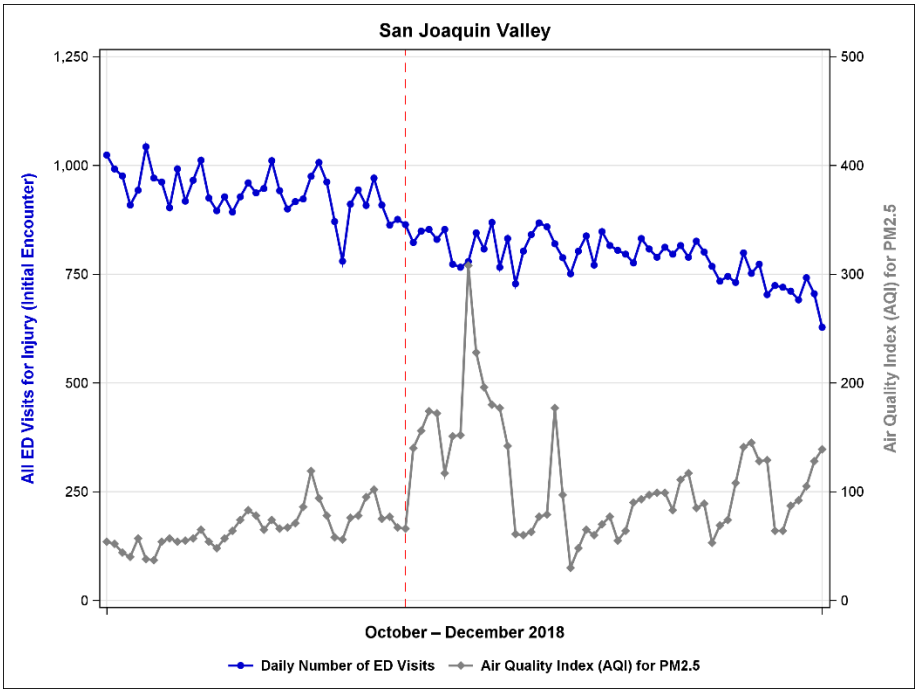
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

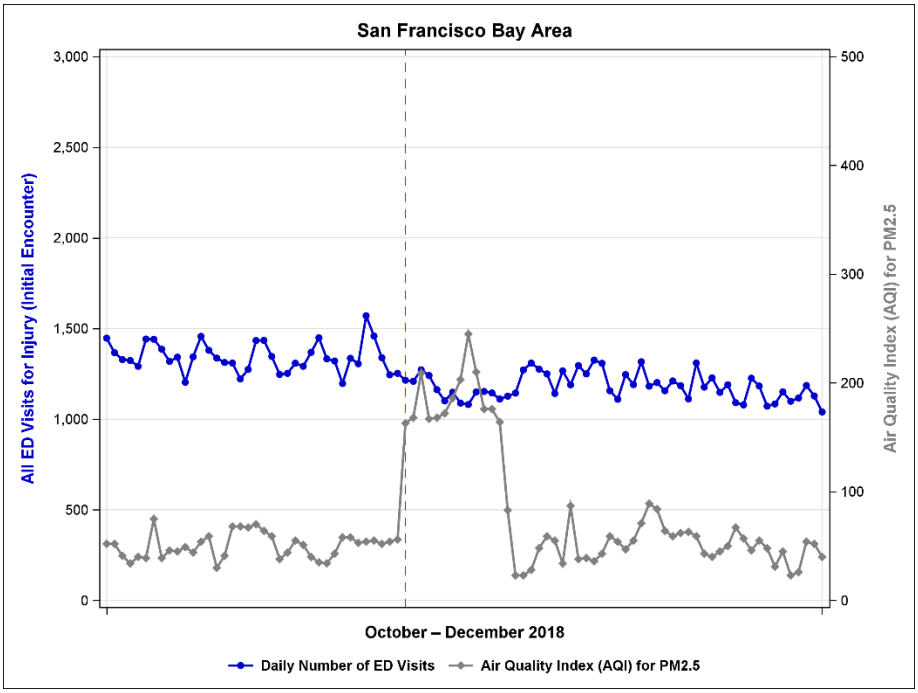
Figure 7c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

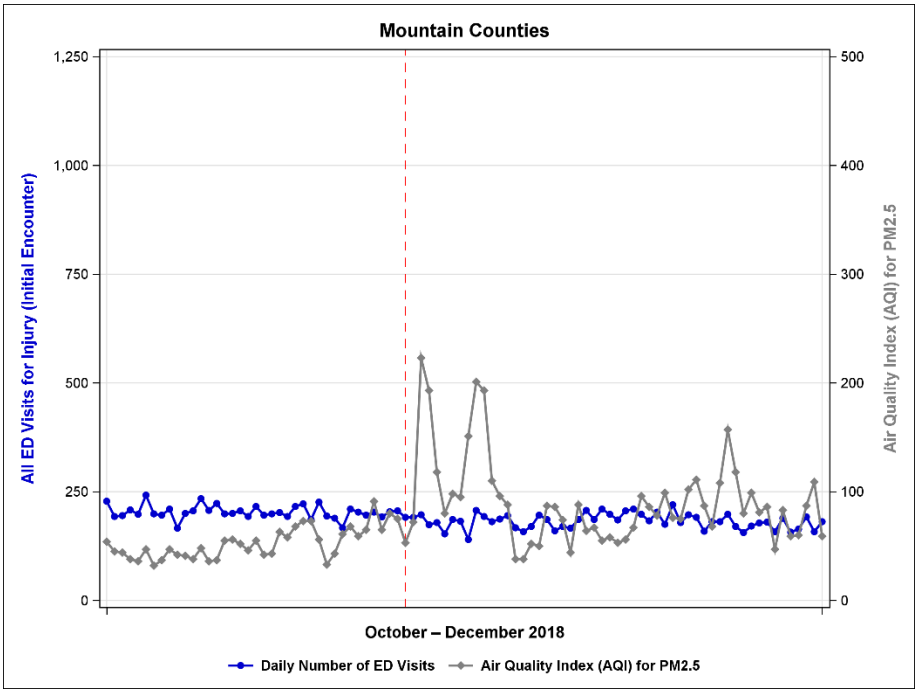
[Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November]

Figure 7d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, San Francisco Bay Area, California, October–December 2018



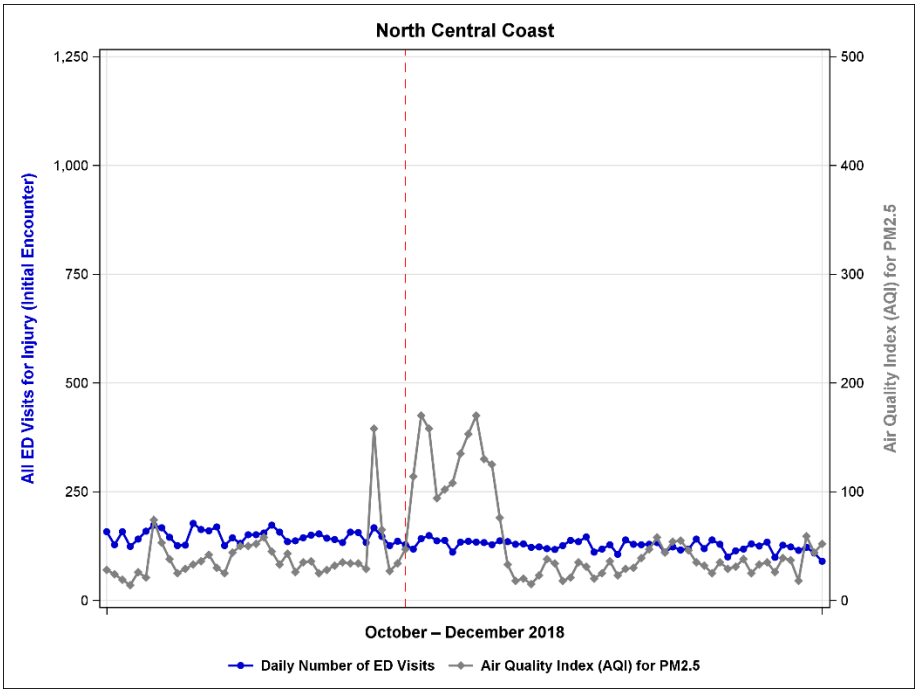
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

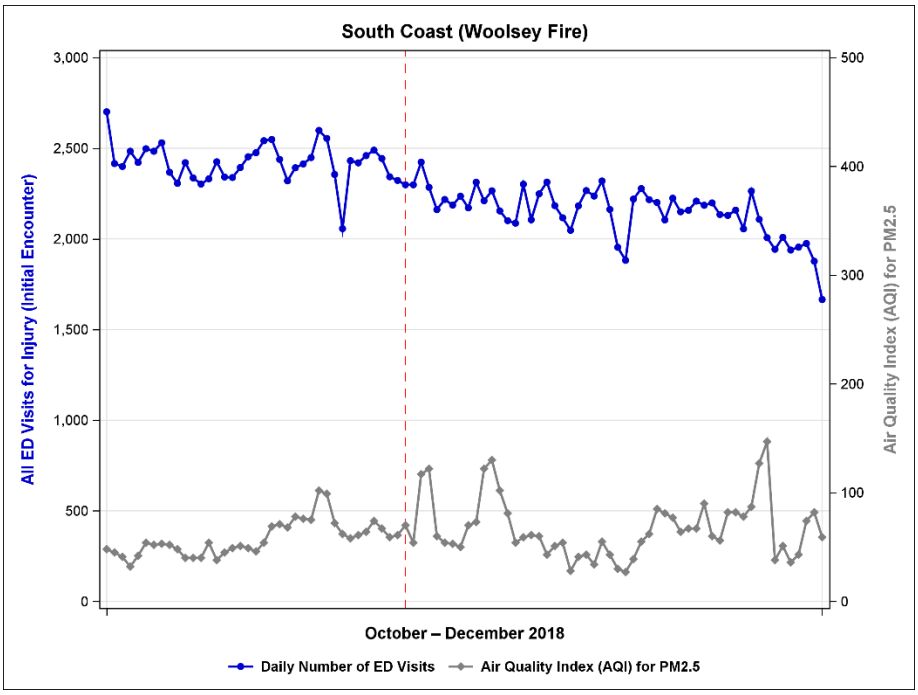
Figure 7f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

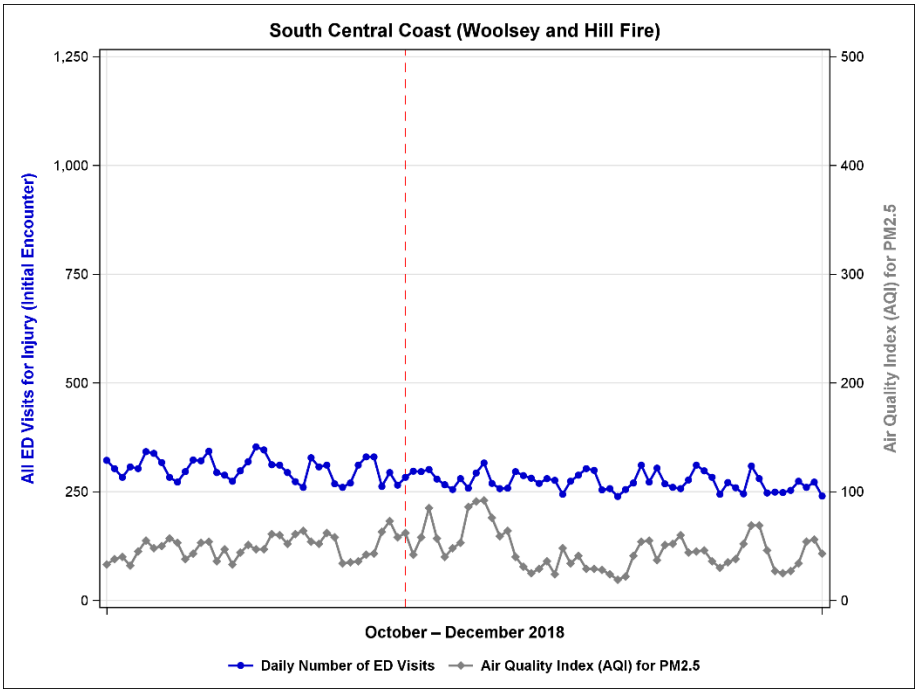
Air Basins with Good to Moderate Air Quality for Most of November

Figure 7g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, South Coast, California, October–December 2018



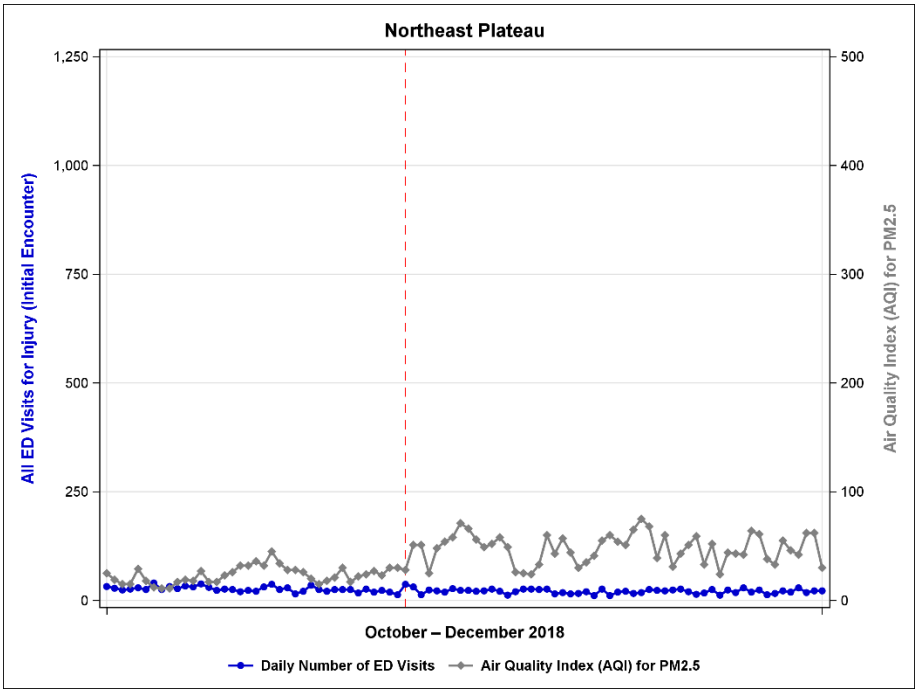
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, South Central Coast, California, October–December 2018



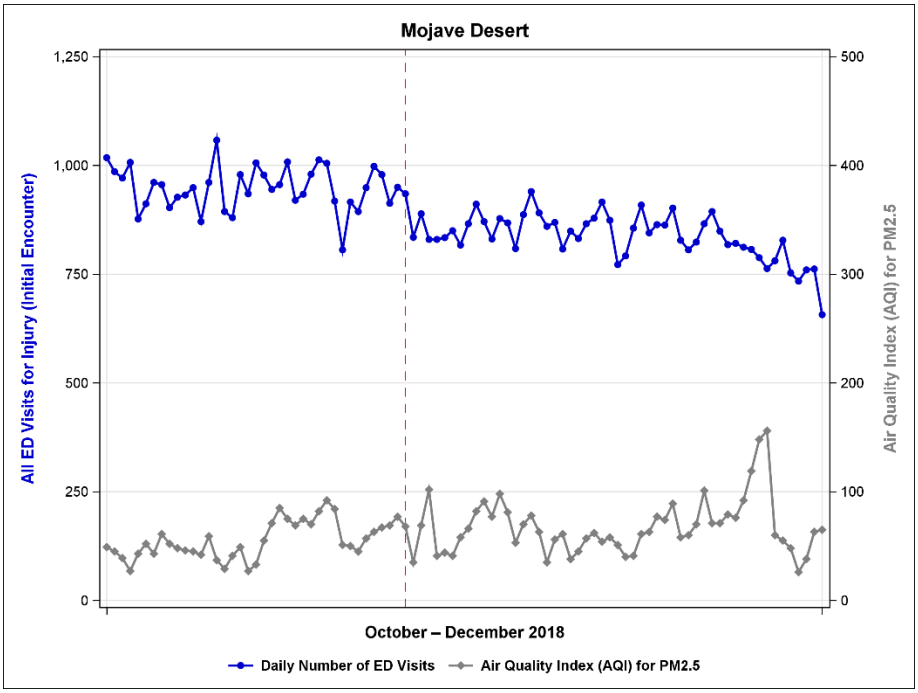
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Northeast Plateau, California, October–December 2018



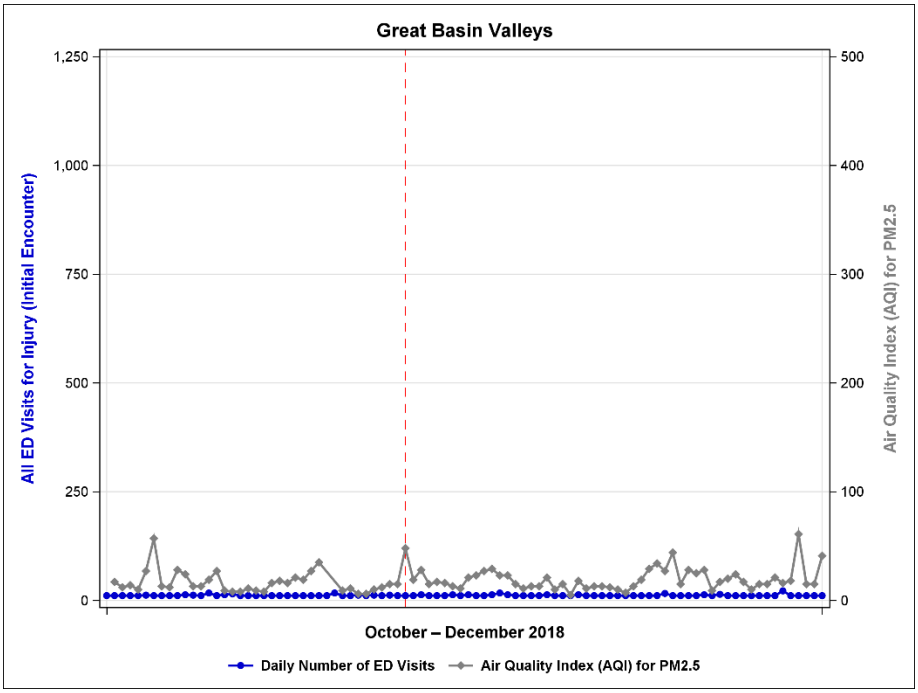
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Mojave Desert, California, October–December 2018



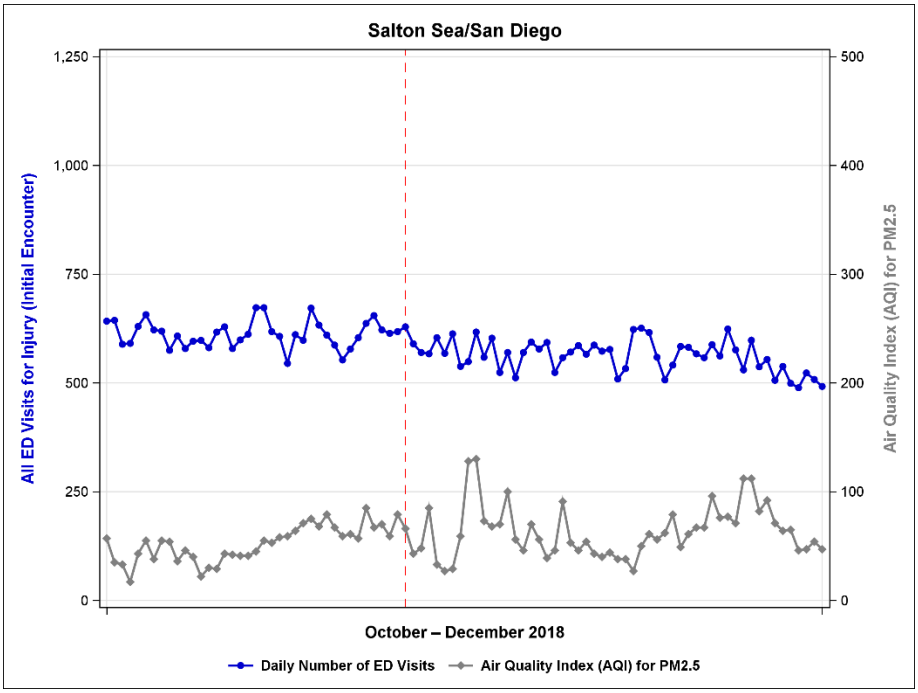
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 7l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for Initial Encounter of Injury, Salton Sea/San Diego, California, October–December 2018



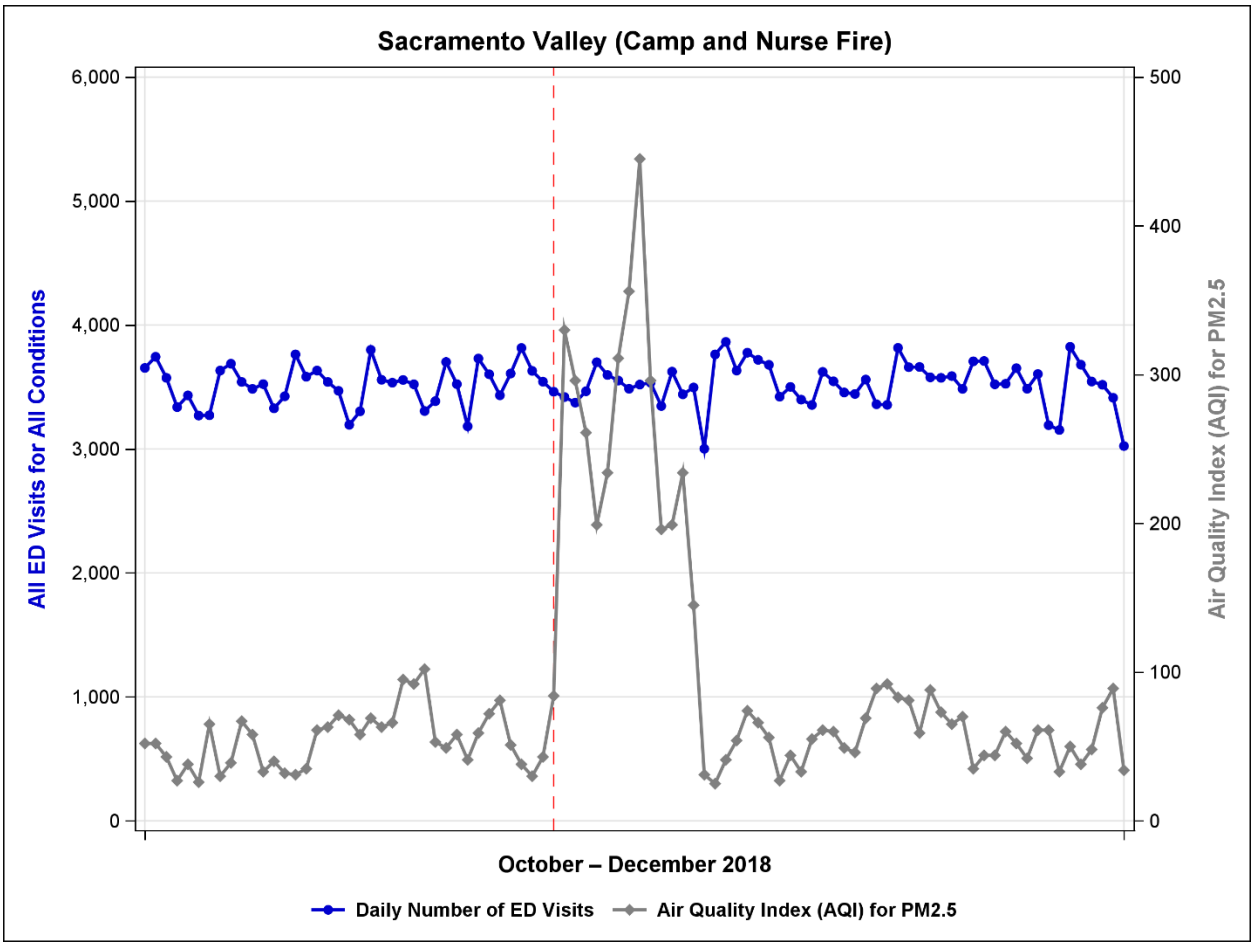
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

All Conditions

Figures 8a–8l present ED visits for all conditions. The maximum for the y-axis indicating ED visits is set to 6,000 for all figures except the more populous air basins (South Coast and San Francisco Bay Area) which have the y-axis set to 15,000.

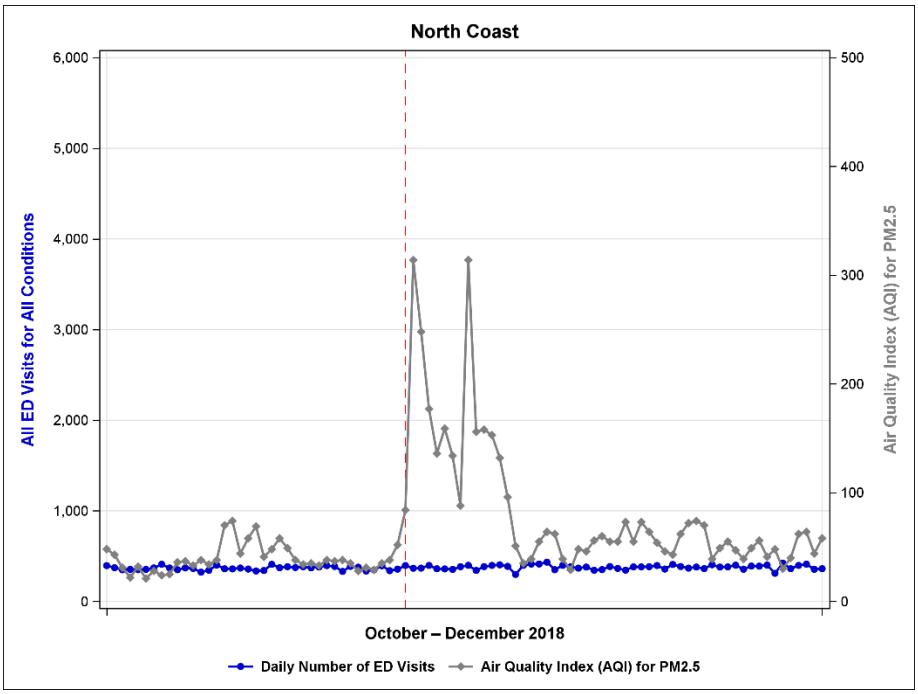
Air Basins with Hazardous Air Quality for at Least One Day in November

Figure 8a: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Sacramento Valley, California, October–December 2018



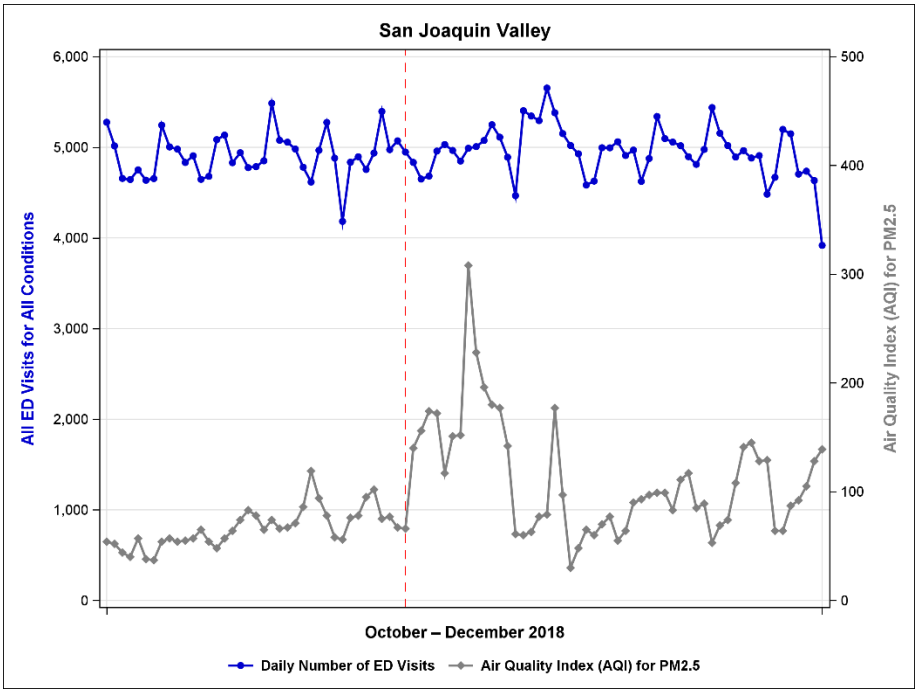
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8b: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, North Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

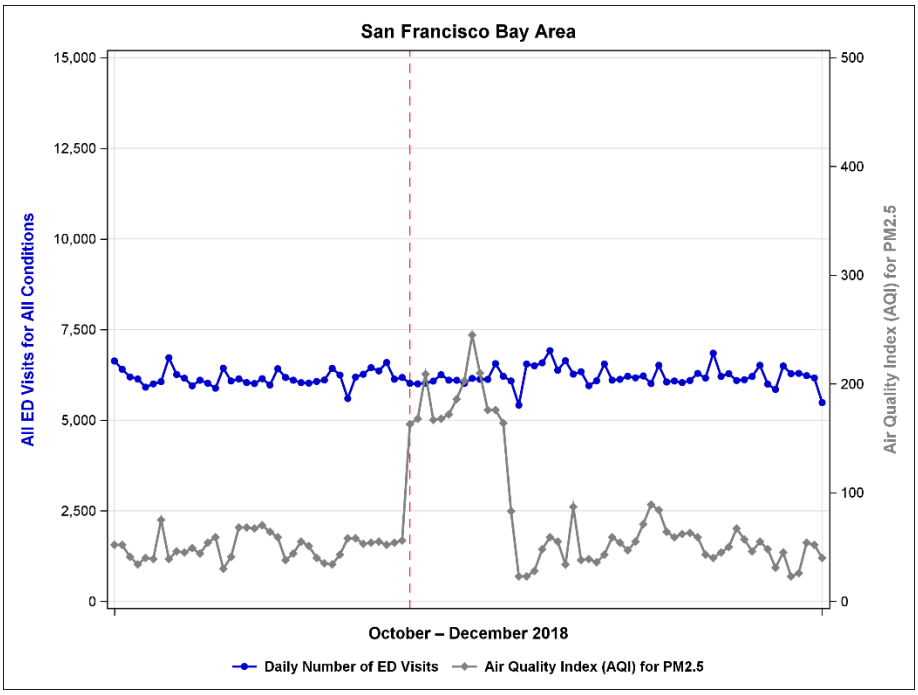
Figure 8c: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, San Joaquin Valley, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

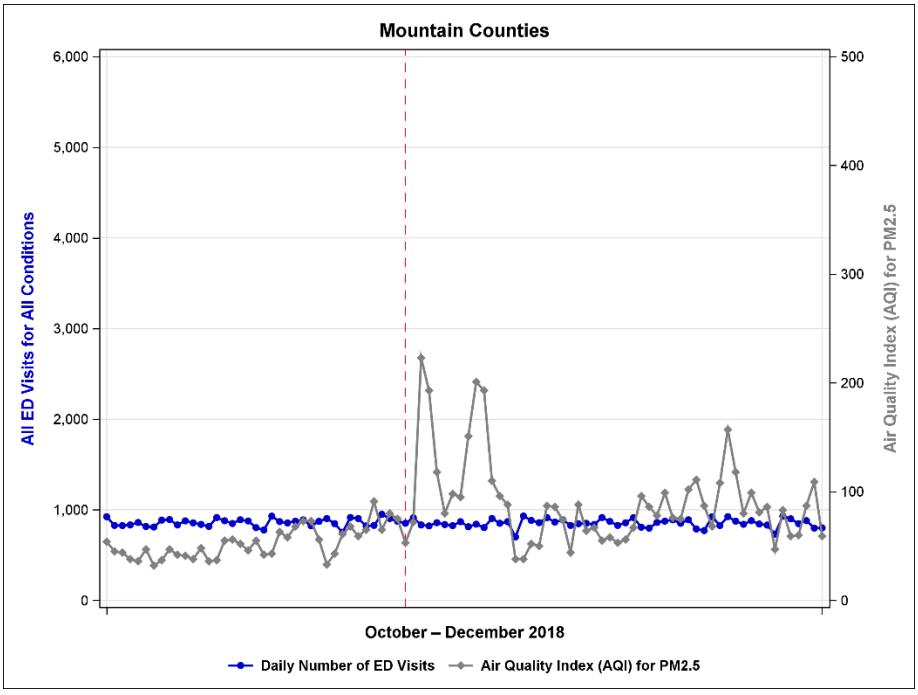
Air Basins with Unhealthy to Very Unhealthy Air Quality for at Least One Day in November

Figure 8d: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, San Francisco Bay Area, California, October–December 2018



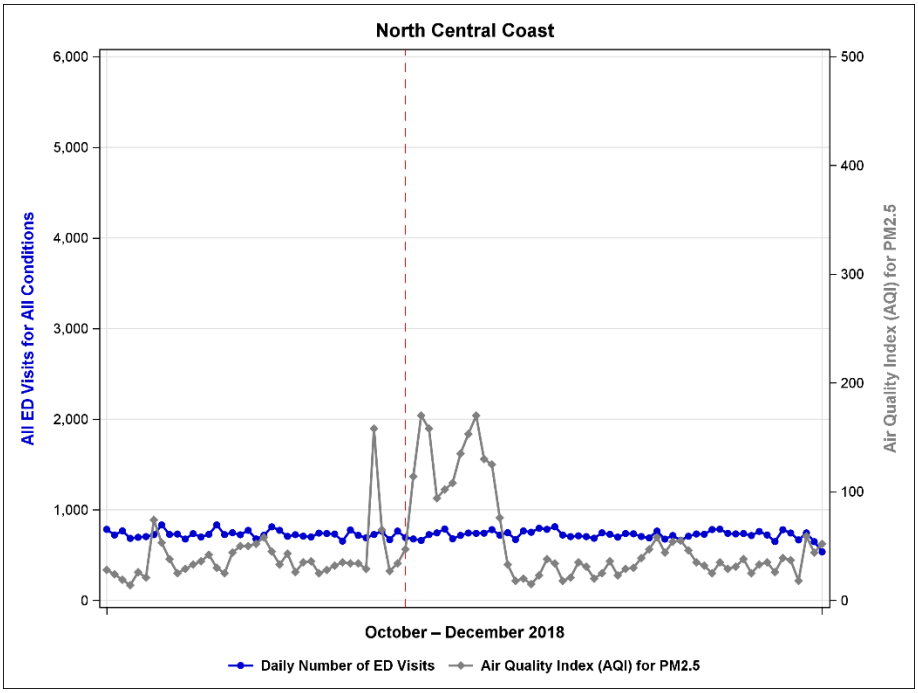
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8e: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Mountain Counties, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

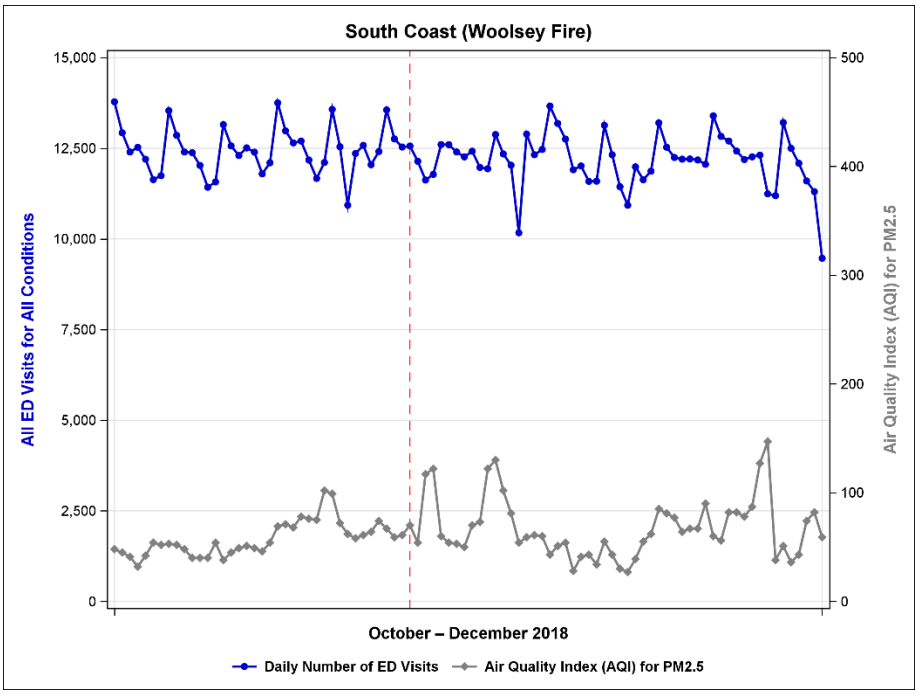
Figure 8f: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, North Central Coast, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

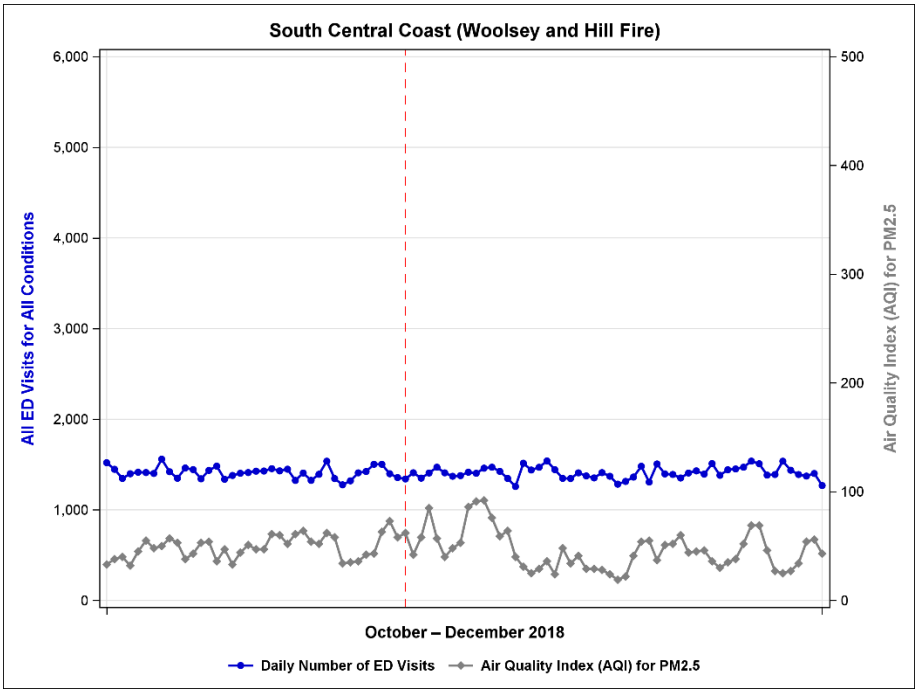
Air Basins with Good to Moderate Air Quality for Most of November

Figure 8g: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, South Coast, California, October–December 2018



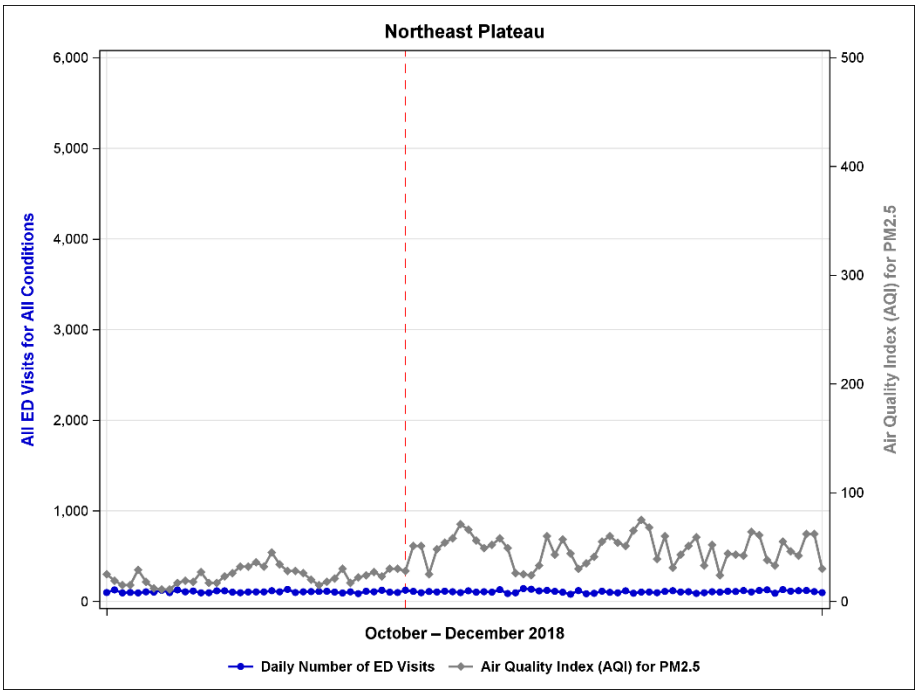
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8h: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, South Central Coast, California, October–December 2018



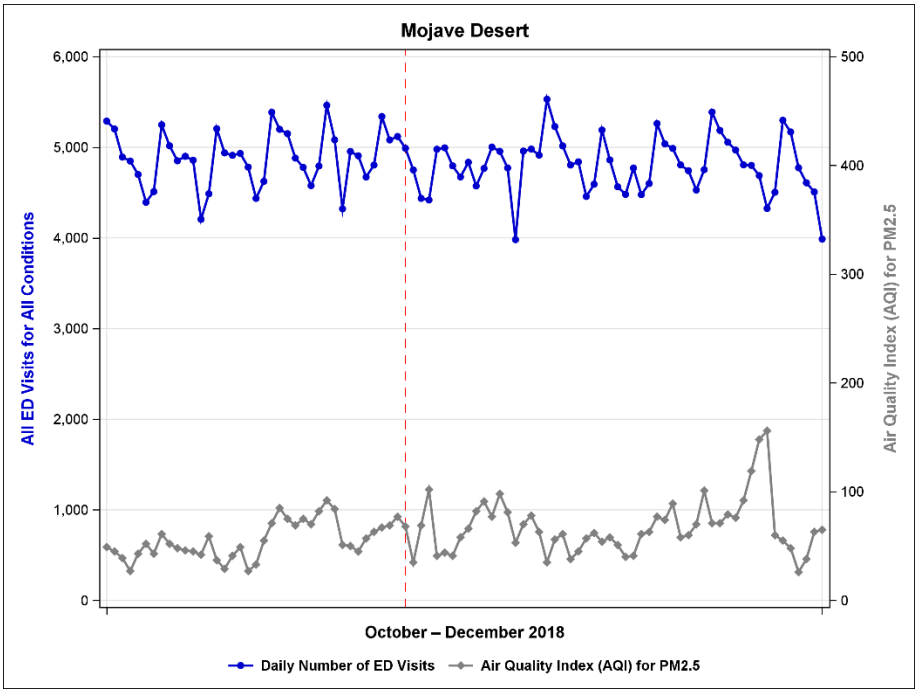
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8i: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Northeast Plateau, California, October–December 2018



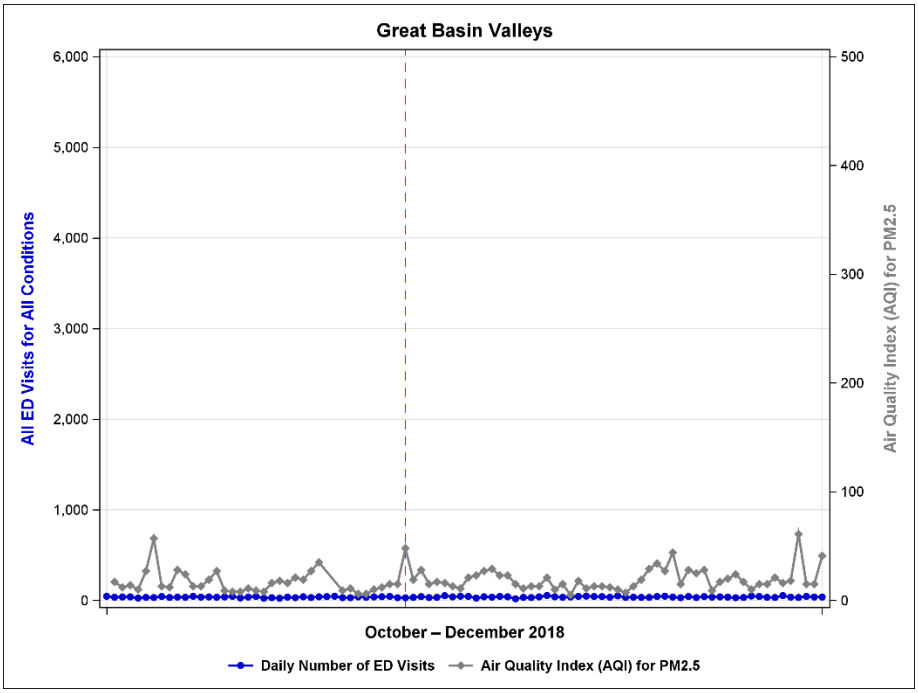
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8j: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Mojave Desert, California, October–December 2018



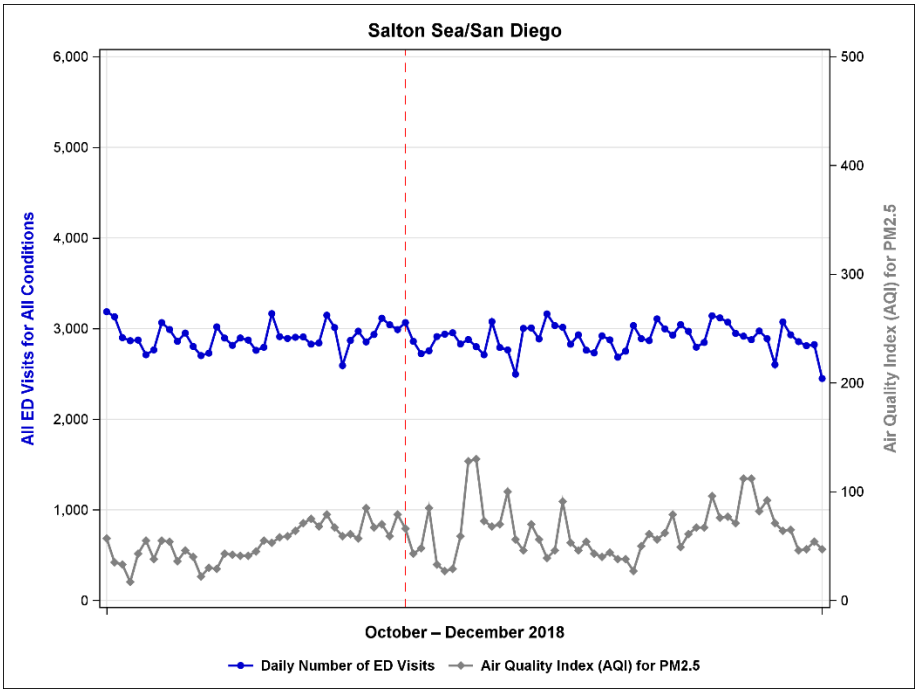
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8k: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Great Basin Valleys, California, October–December 2018



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

Figure 8l: Air Quality Indicator $PM_{2.5}$ and Emergency Department Visits for All Conditions, Salton Sea/San Diego, California, October–December 2018

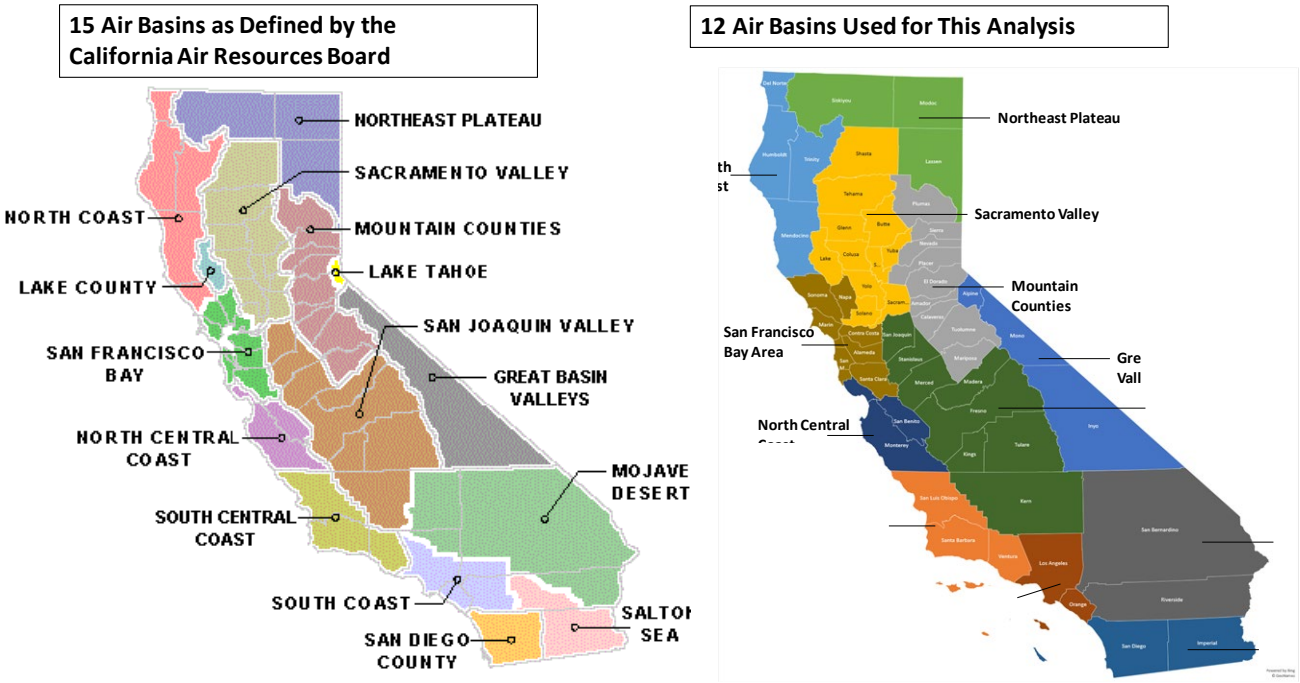


Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Emergency Department Databases (SEDD), California, 2018

APPENDIX A. GROUPINGS OF CALIFORNIA COUNTIES INTO AIR BASINS

The California Air Resources Board defines 15 air basins with some counties included in more than one air basin.[4] For this analysis, counties could only be assigned to one air basin and each air basin needed to include at least 3 hospitals. This resulted in 12 air basins used for this analysis. Figure A.1 shows the map comparing the 15 air basins as defined by the California Air Resources Board to the 12 air basins used for this analysis. Table A.1 lists the counties in each of the 15 air basins and changes made for this analysis.

Figure A.1 Comparison of the 15 Air Basins as Defined by the California Air Resources Board to the 12 Air Basins Used for this Analysis



Source: California Air Resources Board, California Air Basin Map (https://ww3.arb.ca.gov/ei/maps/2017statemap/abmap.htm). Accessed November 4, 2019.

[4] Information on counties included in the California air basins was obtained from the California Air Resources Board website at https://ww3.arb.ca.gov/ei/maps/2017statemap/abmap.htm. Accessed November 4, 2019.

Table A.1 List of the 15 Air Basins as Defined by the California Air Resources Board with Changes for this Analysis Noted

California Air Basin	Counties	Notes on Changes for this Analysis
Great Basin Valleys	Alpine, Inyo, Mono	
Lake County	Lake	This air basin included only one county and was grouped with the neighboring Sacramento Valley because of its small size.
Lake Tahoe	El Dorado, Placer	These two counties also were included under Mountain Counties. The Lake Tahoe air basin was not reported separately.
Mojave Desert	~~Kern~~, ~~Los Angeles~~, San Bernardino, Riverside	**Kern** county was included in two air basins: Mojave Desert and San Joaquin Valley. Because the majority of the county was in the San Joaquin Valley air basin, its data were included under the San Joaquin Valley air basin. **Los Angeles** county was included in two air basins: Mojave Desert and South Coast. Because the majority of the county was in the South Coast air basin, its data were included there.
Mountain Counties	Amador, Calaveras, El Dorado, Mariposa, Nevada, Placer, Plumas, Sierra, Tuolumne	
North Central Coast	Monterey, San Benito, Santa Cruz	
North Coast	Del Norte, Humboldt, Mendocino, ~~Sonoma,~~ Trinity	**Sonoma** county was included in two air basins: North Coast and San Francisco Bay. Because the Sonoma county bridged the area from two other counties (Marin and Napa) in the San Francisco Bay air basin, its data were included under San Francisco Bay.
Northeast Plateau	Lassen, Modoc, Siskiyou	
Sacramento Valley	Butte, Colusa, Glenn, ~~Placer,~~ Sacramento, Shasta, Solano, Sutter, Tehama, Yolo, Yuba + Lake	**Placer** county was included in three air basins: Lake Tahoe, Mountain Counties, and Sacramento Valley. Because the majority of the county was in the Mountain Counties air basin, its data were included there.
Salton Sea	Imperial, ~~Riverside~~	**Riverside** county was included in three air basins: Mojave Desert, Salton Sea, and South Coast. Because the majority of the county was in the Mohave Desert air basin, its data were included there. Because of the small number of hospitals in Imperial county the Salton Sea and San Diego counties were combined into one reporting category.

California Air Basin	Counties	Notes on Changes for this Analysis
San Diego	San Diego	The San Diego air basin was combined with the Imperial county (Salton Sea air basin) for reporting purposes.
San Francisco Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, ~~Solano,~~ Sonoma	**Solano** county was included in two air basins: Sacramento Valley and San Francisco Bay. Because the Nurse Fire started in Solano County the same day as the Camp Fire in the Sacramento Valley air basin, the data for Solano County were included under Sacramento Valley.
San Joaquin Valley	Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare	
South Central Coast	San Luis Obispo, Santa Barbara, Ventura	
South Coast	Los Angeles, Orange, ~~Riverside, San Bernardino~~	**Riverside** county was included in three air basins: Mojave Desert, Salton Sea, and South Coast. Because the majority of the county was in the Mohave Desert air basin, its data were included there. **San Bernardino** county was included in two air basins: Mohave Desert and South Coast. Because the majority of the county was in the Mohave Desert air basin, its data were included there.

Source: California Air Resources Board, California Air Basin Map (https://ww3.arb.ca.gov/ei/maps/2017statemap/abmap.htm). Accessed November 4, 2019.

APPENDIX B. HEALTHCARE COST AND UTILIZATION PROJECT (HCUP) STATE INPATIENT DATABASES (SID) AND STATE EMERGENCY DEPARTMENT DATABASES (SEDD)

The Healthcare Cost and Utilization Project is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

The HCUP State Inpatient Databases (SID) contain the universe of the inpatient discharge abstracts from data organizations participating in HCUP, translated into a uniform format to facilitate multistate comparisons and analyses. The SID capture information on inpatient stays for patients seen in the emergency room and then admitted to the hospital, in addition to patients transferred to the hospital or directly admitted.

The HCUP State Emergency Department Databases (SEDD) include information from hospital-owned emergency departments (EDs) from data organizations participating in HCUP, translated into a uniform format to facilitate multistate comparisons and analyses. The SEDD capture information on ED visits that do not result in an admission to the same hospital (i.e., patients who are treated in the ED and then discharged, transferred to another hospital, left against medical advice, or died).

Researchers and policymakers use the HCUP SID and SEDD to investigate questions unique to one State, to compare data from two or more States, to conduct market area research or small variation analyses, and to identify State-specific trends in inpatient and ED care. The SID and SEDD contain more than 100 clinical and nonclinical data elements included in a hospital abstract, such as:

- Patient demographics characteristics (e.g., sex, age, and, for some States, race/ethnicity)
- Principal (first-listed) and secondary diagnoses and procedures
- Admission and discharge status
- Expected payment source
- Total charges
- Length of stay.

More information is available on the HCUP User Support website (www.hcup-us.ahrq.gov).

APPENDIX C. CLINICAL CODING DEFINITIONS

Condition groups were defined using all-listed International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) diagnosis codes (i.e., both principal diagnosis and secondary diagnoses).

Smoke Inhalation

ICD-10-CM Code	Smoke Inhalation Code Description
J680	Bronchitis and pneumonitis due to chemicals, gases, fumes and vapors
J681	Pulmonary edema due to chemicals, gases, fumes and vapors
J682	Upper respiratory inflammation due to chemicals, gases, fumes and vapors, not elsewhere classified
J683	Other acute and subacute respiratory conditions due to chemicals, gases, fumes and vapors
J684	Chronic respiratory conditions due to chemicals, gases, fumes and vapors
J688	Other respiratory conditions due to chemicals, gases, fumes and vapors
J689	Unspecified respiratory condition due to chemicals, gases, fumes and vapors
J705	Respiratory conditions due to smoke inhalation

Initial Encounter for Exposure or Toxic Effect of Fire and Smoke

Qualifying codes required to have a 7th character of A indicating an initial encounter.

ICD-10-CM Code Range	Exposure/Toxic Effect Code Range Description
External cause codes (excludes controlled fire codes X02 and X03	
X00-	Exposure to uncontrolled fire in building or structure
X01-	Exposure to uncontrolled fire, not in building or structure
X04-	Exposure to ignition of highly flammable material
X05-	Exposure to ignition or melting of nightwear
X06-	Exposure to ignition or melting of other clothing or apparel
X08-	Exposure to other specified smoke, fire and flames
X14-	Contact with other hot air and other hot gases
X19-	Contact with other heat and hot substances
Toxic effect codes	
T5981-	Toxic effect of smoke
T5989-	Toxic effect of other specified gases, fumes and vapors
T599-	Toxic effect of unspecified gases, fumes and vapors

Initial Encounter for Burns (Including but not Limited to Fire Burns)

Qualifying codes required to have a 7th character of A indicating an initial encounter.

ICD-10-CM Code Range	Burn Code Range Description
T200- to T2039-	Burn of head, face, and neck
T210- to T2139-	Burn of the trunk
T220- to T22399-	Burn of shoulder and upper limb, except wrist and hand
T230- to T23399-	Burn of wrist and hand
T240- to T24399-	Burn of lower limb, except ankle and foot
T250- to T25399	Burn of ankle and foot
T260- to T2642-	Burn confined to eye and adnexa
T270- to T273-	Burn of respiratory tract
T280- to T2849-	Burn of other internal organs
T300-	Burn of unspecified body region, unspecified degree
T310- to T3199	Burns classified according to extent of body surface involved

All Respiratory Conditions Other Than Smoke Inhalation

ICD-10-CM Code	Respiratory Code Description
A0103	Typhoid pneumonia
A0222	Salmonella pneumonia
A065	Amebic lung abscess
A155	Tuberculosis of larynx, trachea and bronchus
A156	Tuberculous pleurisy
A157	Primary respiratory tuberculosis
A158	Other respiratory tuberculosis
A159	Respiratory tuberculosis unspecified
A202	Pneumonic plague
A212	Pulmonary tularemia
A221	Pulmonary anthrax
A310	Pulmonary mycobacterial infection
A360	Pharyngeal diphtheria
A361	Nasopharyngeal diphtheria
A362	Laryngeal diphtheria
A3701	Whooping cough due to Bordetella pertussis with pneumonia
A3711	Whooping cough due to Bordetella parapertussis with pneumonia
A3781	Whooping cough due to other Bordetella species with pneumonia
A3791	Whooping cough, unspecified species with pneumonia
A430	Pulmonary nocardiosis
A481	Legionnaires' disease
A5003	Early congenital syphilitic pharyngitis
A5004	Early congenital syphilitic pneumonia
A5005	Early congenital syphilitic rhinitis
A5272	Syphilis of lung and bronchus

ICD-10-CM Code	Respiratory Code Description
A5273	Symptomatic late syphilis of other respiratory organs
A545	Gonococcal pharyngitis
A5484	Gonococcal pneumonia
A564	Chlamydial infection of pharynx
B002	Herpesviral gingivostomatitis and pharyngotonsillitis
B012	Varicella pneumonia
B052	Measles complicated by pneumonia
B0681	Rubella pneumonia
B085	Enteroviral vesicular pharyngitis
B250	Cytomegaloviral pneumonitis
B371	Pulmonary candidiasis
B380	Acute pulmonary coccidioidomycosis
B381	Chronic pulmonary coccidioidomycosis
B382	Pulmonary coccidioidomycosis, unspecified
B390	Acute pulmonary histoplasmosis capsulati
B391	Chronic pulmonary histoplasmosis capsulati
B392	Pulmonary histoplasmosis capsulati, unspecified
B400	Acute pulmonary blastomycosis
B401	Chronic pulmonary blastomycosis
B402	Pulmonary blastomycosis, unspecified
B410	Pulmonary paracoccidioidomycosis
B420	Pulmonary sporotrichosis
B440	Invasive pulmonary aspergillosis
B441	Other pulmonary aspergillosis
B450	Pulmonary cryptococcosis
B460	Pulmonary mucormycosis
B583	Pulmonary toxoplasmosis
B59	Pneumocystosis
B671	Echinococcus granulosus infection of lung
B7781	Ascariasis pneumonia
J00	Acute nasopharyngitis [common cold]
J0100	Acute maxillary sinusitis, unspecified
J0101	Acute recurrent maxillary sinusitis
J0110	Acute frontal sinusitis, unspecified
J0111	Acute recurrent frontal sinusitis
J0120	Acute ethmoidal sinusitis, unspecified
J0121	Acute recurrent ethmoidal sinusitis
J0130	Acute sphenoidal sinusitis, unspecified
J0131	Acute recurrent sphenoidal sinusitis
J0140	Acute pansinusitis, unspecified
J0141	Acute recurrent pansinusitis
J0180	Other acute sinusitis
J0181	Other acute recurrent sinusitis
J0190	Acute sinusitis, unspecified
J0191	Acute recurrent sinusitis, unspecified
J020	Streptococcal pharyngitis

ICD-10-CM Code	Respiratory Code Description
J028	Acute pharyngitis due to other specified organisms
J029	Acute pharyngitis, unspecified
J0300	Acute streptococcal tonsillitis, unspecified
J0301	Acute recurrent streptococcal tonsillitis
J0380	Acute tonsillitis due to other specified organisms
J0381	Acute recurrent tonsillitis due to other specified organisms
J0390	Acute tonsillitis, unspecified
J0391	Acute recurrent tonsillitis, unspecified
J040	Acute laryngitis
J0410	Acute tracheitis without obstruction
J0411	Acute tracheitis with obstruction
J042	Acute laryngotracheitis
J0430	Supraglottitis, unspecified, without obstruction
J0431	Supraglottitis, unspecified, with obstruction
J050	Acute obstructive laryngitis [croup]
J0510	Acute epiglottitis without obstruction
J0511	Acute epiglottitis with obstruction
J060	Acute laryngopharyngitis
J069	Acute upper respiratory infection, unspecified
J09X1	Influenza due to identified novel influenza A virus with pneumonia
J09X1	Influenza due to identified novel influenza A virus with pneumonia
J09X2	Influenza due to identified novel influenza A virus with other respiratory manifestations
J09X3	Influenza due to identified novel influenza A virus with gastrointestinal manifestations
J09X9	Influenza due to identified novel influenza A virus with other manifestations
J1000	Influenza due to other identified influenza virus with unspecified type of pneumonia
J1000	Influenza due to other identified influenza virus with unspecified type of pneumonia
J1001	Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia
J1001	Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia
J1008	Influenza due to other identified influenza virus with other specified pneumonia
J1008	Influenza due to other identified influenza virus with other specified pneumonia
J101	Influenza due to other identified influenza virus with other respiratory manifestations
J102	Influenza due to other identified influenza virus with gastrointestinal manifestations
J1081	Influenza due to other identified influenza virus with encephalopathy
J1082	Influenza due to other identified influenza virus with myocarditis
J1089	Influenza due to other identified influenza virus with other manifestations
J1100	Influenza due to unidentified influenza virus with unspecified type of pneumonia
J1100	Influenza due to unidentified influenza virus with unspecified type of pneumonia
J1108	Influenza due to unidentified influenza virus with specified pneumonia
J1108	Influenza due to unidentified influenza virus with specified pneumonia

ICD-10-CM Code	Respiratory Code Description
J111	Influenza due to unidentified influenza virus with other respiratory manifestations
J112	Influenza due to unidentified influenza virus with gastrointestinal manifestations
J1181	Influenza due to unidentified influenza virus with encephalopathy
J1182	Influenza due to unidentified influenza virus with myocarditis
J1183	Influenza due to unidentified influenza virus with otitis media
J1189	Influenza due to unidentified influenza virus with other manifestations
J120	Adenoviral pneumonia
J121	Respiratory syncytial virus pneumonia
J122	Parainfluenza virus pneumonia
J123	Human metapneumovirus pneumonia
J1281	Pneumonia due to SARS-associated coronavirus
J1289	Other viral pneumonia
J129	Viral pneumonia, unspecified
J13	Pneumonia due to Streptococcus pneumoniae
J14	Pneumonia due to Hemophilus influenzae
J150	Pneumonia due to Klebsiella pneumoniae
J151	Pneumonia due to Pseudomonas
J1520	Pneumonia due to staphylococcus, unspecified
J15211	Pneumonia due to Methicillin susceptible Staphylococcus aureus
J15212	Pneumonia due to Methicillin resistant Staphylococcus aureus
J1529	Pneumonia due to other staphylococcus
J153	Pneumonia due to streptococcus, group B
J154	Pneumonia due to other streptococci
J155	Pneumonia due to Escherichia coli
J156	Pneumonia due to other Gram-negative bacteria
J157	Pneumonia due to Mycoplasma pneumoniae
J158	Pneumonia due to other specified bacteria
J159	Unspecified bacterial pneumonia
J160	Chlamydial pneumonia
J168	Pneumonia due to other specified infectious organisms
J17	Pneumonia in diseases classified elsewhere
J180	Bronchopneumonia, unspecified organism
J181	Lobar pneumonia, unspecified organism
J182	Hypostatic pneumonia, unspecified organism
J188	Other pneumonia, unspecified organism
J189	Pneumonia, unspecified organism
J200	Acute bronchitis due to Mycoplasma pneumoniae
J201	Acute bronchitis due to Hemophilus influenzae
J202	Acute bronchitis due to streptococcus
J203	Acute bronchitis due to coxsackievirus
J204	Acute bronchitis due to parainfluenza virus
J205	Acute bronchitis due to respiratory syncytial virus
J206	Acute bronchitis due to rhinovirus
J207	Acute bronchitis due to echovirus
J208	Acute bronchitis due to other specified organisms
J209	Acute bronchitis, unspecified

ICD-10-CM Code	Respiratory Code Description
J210	Acute bronchiolitis due to respiratory syncytial virus
J211	Acute bronchiolitis due to human metapneumovirus
J218	Acute bronchiolitis due to other specified organisms
J219	Acute bronchiolitis, unspecified
J22	Unspecified acute lower respiratory infection
J300	Vasomotor rhinitis
J301	Allergic rhinitis due to pollen
J302	Other seasonal allergic rhinitis
J305	Allergic rhinitis due to food
J3081	Allergic rhinitis due to animal (cat) (dog) hair and dander
J3089	Other allergic rhinitis
J309	Allergic rhinitis, unspecified
J310	Chronic rhinitis
J311	Chronic nasopharyngitis
J312	Chronic pharyngitis
J320	Chronic maxillary sinusitis
J321	Chronic frontal sinusitis
J322	Chronic ethmoidal sinusitis
J323	Chronic sphenoidal sinusitis
J324	Chronic pansinusitis
J328	Other chronic sinusitis
J329	Chronic sinusitis, unspecified
J330	Polyp of nasal cavity
J331	Polypoid sinus degeneration
J338	Other polyp of sinus
J339	Nasal polyp, unspecified
J340	Abscess, furuncle and carbuncle of nose
J341	Cyst and mucocele of nose and nasal sinus
J342	Deviated nasal septum
J343	Hypertrophy of nasal turbinates
J3481	Nasal mucositis (ulcerative)
J3489	Other specified disorders of nose and nasal sinuses
J349	Unspecified disorder of nose and nasal sinuses
J3501	Chronic tonsillitis
J3502	Chronic adenoiditis
J3503	Chronic tonsillitis and adenoiditis
J351	Hypertrophy of tonsils
J352	Hypertrophy of adenoids
J353	Hypertrophy of tonsils with hypertrophy of adenoids
J358	Other chronic diseases of tonsils and adenoids
J359	Chronic disease of tonsils and adenoids, unspecified
J36	Peritonsillar abscess
J370	Chronic laryngitis
J371	Chronic laryngotracheitis
J3800	Paralysis of vocal cords and larynx, unspecified
J3801	Paralysis of vocal cords and larynx, unilateral

ICD-10-CM Code	Respiratory Code Description
J3802	Paralysis of vocal cords and larynx, bilateral
J381	Polyp of vocal cord and larynx
J382	Nodules of vocal cords
J383	Other diseases of vocal cords
J384	Edema of larynx
J385	Laryngeal spasm
J386	Stenosis of larynx
J387	Other diseases of larynx
J390	Retropharyngeal and parapharyngeal abscess
J391	Other abscess of pharynx
J392	Other diseases of pharynx
J393	Upper respiratory tract hypersensitivity reaction, site unspecified
J398	Other specified diseases of upper respiratory tract
J399	Disease of upper respiratory tract, unspecified
J40	Bronchitis, not specified as acute or chronic
J410	Simple chronic bronchitis
J411	Mucopurulent chronic bronchitis
J418	Mixed simple and mucopurulent chronic bronchitis
J42	Unspecified chronic bronchitis
J430	Unilateral pulmonary emphysema [MacLeod's syndrome]
J431	Panlobular emphysema
J432	Centrilobular emphysema
J438	Other emphysema
J439	Emphysema, unspecified
J440	Chronic obstructive pulmonary disease with acute lower respiratory infection
J441	Chronic obstructive pulmonary disease with (acute) exacerbation
J449	Chronic obstructive pulmonary disease, unspecified
J4520	Mild intermittent asthma, uncomplicated
J4521	Mild intermittent asthma with (acute) exacerbation
J4522	Mild intermittent asthma with status asthmaticus
J4530	Mild persistent asthma, uncomplicated
J4531	Mild persistent asthma with (acute) exacerbation
J4532	Mild persistent asthma with status asthmaticus
J4540	Moderate persistent asthma, uncomplicated
J4541	Moderate persistent asthma with (acute) exacerbation
J4542	Moderate persistent asthma with status asthmaticus
J4550	Severe persistent asthma, uncomplicated
J4551	Severe persistent asthma with (acute) exacerbation
J4552	Severe persistent asthma with status asthmaticus
J45901	Unspecified asthma with (acute) exacerbation
J45902	Unspecified asthma with status asthmaticus
J45909	Unspecified asthma, uncomplicated
J45990	Exercise induced bronchospasm
J45991	Cough variant asthma
J45998	Other asthma
J470	Bronchiectasis with acute lower respiratory infection

ICD-10-CM Code	Respiratory Code Description
J471	Bronchiectasis with (acute) exacerbation
J479	Bronchiectasis, uncomplicated
J60	Coalworker's pneumoconiosis
J61	Pneumoconiosis due to asbestos and other mineral fibers
J620	Pneumoconiosis due to talc dust
J628	Pneumoconiosis due to other dust containing silica
J630	Aluminosis (of lung)
J631	Bauxite fibrosis (of lung)
J632	Berylliosis
J633	Graphite fibrosis (of lung)
J634	Siderosis
J635	Stannosis
J636	Pneumoconiosis due to other specified inorganic dusts
J64	Unspecified pneumoconiosis
J65	Pneumoconiosis associated with tuberculosis
J660	Byssinosis
J661	Flax-dressers' disease
J662	Cannabinosis
J668	Airway disease due to other specific organic dusts
J670	Farmer's lung
J671	Bagassosis
J672	Bird fancier's lung
J673	Suberosis
J674	Maltworker's lung
J675	Mushroom-worker's lung
J676	Maple-bark-stripper's lung
J677	Air conditioner and humidifier lung
J678	Hypersensitivity pneumonitis due to other organic dusts
J679	Hypersensitivity pneumonitis due to unspecified organic dust
J690	Pneumonitis due to inhalation of food and vomit
J691	Pneumonitis due to inhalation of oils and essences
J691	Pneumonitis due to inhalation of oils and essences
J698	Pneumonitis due to inhalation of other solids and liquids
J698	Pneumonitis due to inhalation of other solids and liquids
J700	Acute pulmonary manifestations due to radiation
J701	Chronic and other pulmonary manifestations due to radiation
J702	Acute drug-induced interstitial lung disorders
J703	Chronic drug-induced interstitial lung disorders
J704	Drug-induced interstitial lung disorders, unspecified
J708	Respiratory conditions due to other specified external agents
J709	Respiratory conditions due to unspecified external agent
J80	Acute respiratory distress syndrome
J810	Acute pulmonary edema
J811	Chronic pulmonary edema
J82	Pulmonary eosinophilia, not elsewhere classified
J8401	Alveolar proteinosis

ICD-10-CM Code	Respiratory Code Description
J8402	Pulmonary alveolar microlithiasis
J8403	Idiopathic pulmonary hemosiderosis
J8409	Other alveolar and parieto-alveolar conditions
J8410	Pulmonary fibrosis, unspecified
J84111	Idiopathic interstitial pneumonia, not otherwise specified
J84112	Idiopathic pulmonary fibrosis
J84113	Idiopathic non-specific interstitial pneumonitis
J84114	Acute interstitial pneumonitis
J84115	Respiratory bronchiolitis interstitial lung disease
J84116	Cryptogenic organizing pneumonia
J84117	Desquamative interstitial pneumonia
J8417	Other interstitial pulmonary diseases with fibrosis in diseases classified elsewhere
J842	Lymphoid interstitial pneumonia
J8481	Lymphangioleiomyomatosis
J8482	Adult pulmonary Langerhans cell histiocytosis
J8483	Surfactant mutations of the lung
J84841	Neuroendocrine cell hyperplasia of infancy
J84842	Pulmonary interstitial glycogenosis
J84843	Alveolar capillary dysplasia with vein misalignment
J84848	Other interstitial lung diseases of childhood
J8489	Other specified interstitial pulmonary diseases
J849	Interstitial pulmonary disease, unspecified
J851	Abscess of lung with pneumonia
J852	Abscess of lung without pneumonia
J853	Abscess of mediastinum
J860	Pyothorax with fistula
J869	Pyothorax without fistula
J90	Pleural effusion, not elsewhere classified
J910	Malignant pleural effusion
J918	Pleural effusion in other conditions classified elsewhere
J920	Pleural plaque with presence of asbestos
J929	Pleural plaque without asbestos
J930	Spontaneous tension pneumothorax
J9311	Primary spontaneous pneumothorax
J9312	Secondary spontaneous pneumothorax
J9381	Chronic pneumothorax
J9382	Other air leak
J9383	Other pneumothorax
J939	Pneumothorax, unspecified
J940	Chylous effusion
J941	Fibrothorax
J942	Hemothorax
J948	Other specified pleural conditions
J949	Pleural condition, unspecified
J954	Chemical pneumonitis due to anesthesia
J95811	Postprocedural pneumothorax

ICD-10-CM Code	Respiratory Code Description
J95821	Acute postprocedural respiratory failure
J95822	Acute and chronic postprocedural respiratory failure
J95851	Ventilator associated pneumonia
J9600	Acute respiratory failure, unspecified whether with hypoxia or hypercapnia
J9601	Acute respiratory failure with hypoxia
J9602	Acute respiratory failure with hypercapnia
J9610	Chronic respiratory failure, unspecified whether with hypoxia or hypercapnia
J9611	Chronic respiratory failure with hypoxia
J9612	Chronic respiratory failure with hypercapnia
J9620	Acute and chronic respiratory failure, unspecified whether with hypoxia or hypercapnia
J9621	Acute and chronic respiratory failure with hypoxia
J9622	Acute and chronic respiratory failure with hypercapnia
J9690	Respiratory failure, unspecified, unspecified whether with hypoxia or hypercapnia
J9691	Respiratory failure, unspecified with hypoxia
J9692	Respiratory failure, unspecified with hypercapnia
J9801	Acute bronchospasm
J9809	Other diseases of bronchus, not elsewhere classified
J9811	Atelectasis
J9819	Other pulmonary collapse
J982	Interstitial emphysema
J983	Compensatory emphysema
J984	Other disorders of lung
J985	Diseases of mediastinum, not elsewhere classified
J9851	Mediastinitis
J9859	Other diseases of mediastinum, not elsewhere classified
J986	Disorders of diaphragm
J988	Other specified respiratory disorders
J989	Respiratory disorder, unspecified
J99	Respiratory disorders in diseases classified elsewhere
M0510	Rheumatoid lung disease with rheumatoid arthritis of unspecified site
M05111	Rheumatoid lung disease with rheumatoid arthritis of right shoulder
M05112	Rheumatoid lung disease with rheumatoid arthritis of left shoulder
M05119	Rheumatoid lung disease with rheumatoid arthritis of unspecified shoulder
M05121	Rheumatoid lung disease with rheumatoid arthritis of right elbow
M05122	Rheumatoid lung disease with rheumatoid arthritis of left elbow
M05129	Rheumatoid lung disease with rheumatoid arthritis of unspecified elbow
M05131	Rheumatoid lung disease with rheumatoid arthritis of right wrist
M05132	Rheumatoid lung disease with rheumatoid arthritis of left wrist
M05139	Rheumatoid lung disease with rheumatoid arthritis of unspecified wrist
M05141	Rheumatoid lung disease with rheumatoid arthritis of right hand
M05142	Rheumatoid lung disease with rheumatoid arthritis of left hand
M05149	Rheumatoid lung disease with rheumatoid arthritis of unspecified hand
M05151	Rheumatoid lung disease with rheumatoid arthritis of right hip
M05152	Rheumatoid lung disease with rheumatoid arthritis of left hip
M05159	Rheumatoid lung disease with rheumatoid arthritis of unspecified hip

ICD-10-CM Code	Respiratory Code Description
M05161	Rheumatoid lung disease with rheumatoid arthritis of right knee
M05162	Rheumatoid lung disease with rheumatoid arthritis of left knee
M05169	Rheumatoid lung disease with rheumatoid arthritis of unspecified knee
M05171	Rheumatoid lung disease with rheumatoid arthritis of right ankle and foot
M05172	Rheumatoid lung disease with rheumatoid arthritis of left ankle and foot
M05179	Rheumatoid lung disease with rheumatoid arthritis of unspecified ankle and foot
M0519	Rheumatoid lung disease with rheumatoid arthritis of multiple sites
O29011	Aspiration pneumonitis due to anesthesia during pregnancy, first trimester
O29012	Aspiration pneumonitis due to anesthesia during pregnancy, second trimester
O29013	Aspiration pneumonitis due to anesthesia during pregnancy, third trimester
O29019	Aspiration pneumonitis due to anesthesia during pregnancy, unspecified trimester
O740	Aspiration pneumonitis due to anesthesia during labor and delivery
O8901	Aspiration pneumonitis due to anesthesia during the puerperium
P230	Congenital pneumonia due to viral agent
P231	Congenital pneumonia due to Chlamydia
P232	Congenital pneumonia due to staphylococcus
P233	Congenital pneumonia due to streptococcus, group B
P234	Congenital pneumonia due to Escherichia coli
P235	Congenital pneumonia due to Pseudomonas
P236	Congenital pneumonia due to other bacterial agents
P238	Congenital pneumonia due to other organisms
P239	Congenital pneumonia, unspecified
P251	Pneumothorax originating in the perinatal period
P252	Pneumomediastinum originating in the perinatal period
P285	Respiratory failure of newborn
Q341	Congenital cyst of mediastinum
R0901	Asphyxia
R091	Pleurisy
R092	Respiratory arrest

Initial Encounter for Injury (Including Burns)

Qualifying codes required to have a 7th character of A, B, C or missing indicating an initial encounter.

ICD-10-CM Code Range	Injury Code Range Description
S00- to S99	Injuries head, neck, thorax, abdomen, lower back, lumbar spine, pelvis, shoulder, arm, elbow, forearm, wrist, hand, hip, thigh, knee, leg, ankle, and foot
T07- to T14-	Injuries involving multiple body regions or unspecified body regions
T15- to T19-	Effects of foreign body entering through natural orifice
T20- to T34-	Burns and frostbite
T36- to T50- with a 6th character of 1, 2, 3, or 4 (Exceptions: T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 with a 5th character of 1, 2, 3, or 4)	Poisoning by, adverse effect of drugs, medicaments and biological substances
T51- to T65-	Toxic effects of substances chiefly nonmedicinal as to source (non-drug poisoning)
T66- to T70-	Radiation, effects of health and light, hypothermia, other effects of reduced temperature, effects of air and water pressure
T71-	Asphyxiation
T72- to T76-	Effects of other deprivation, abuse, neglect, maltreatment and other/unspecified effects of other external causes and adverse effects
T79-	Certain early complications of trauma
T8404-	Periprosthetic fracture around internal prosthetic joint (valid until September 30, 2016)
M97-	Periprosthetic fracture around internal prosthetic joint (valid starting October 1, 2016)
O9A2-	Injury, poisoning and certain other consequences of external causes complicating pregnancy, childbirth and the puerperium and
O9A5-	Psychological abuse complicating pregnancy, childbirth and the puerperium