**MONITORING THE 2016 LOS ANGELES COUNTY SAND
FIRE WITH MULTIPLE EARLY DETECTION SYSTEMS**

INTRODUCTION

On July 22, 2016, the Sand Fire began burning in the Santa Clarita Valley of Los Angeles County (LAC), CA. This urban-adjacent wildfire breached the city limits of Santa Clarita (population 180,000). Fueled by record heat and an ongoing exceptional drought, the Sand Fire burned over 40,000 acres in 13 days [1] and caused a large increase in the air concentration of fine particulate matter [2].

The syndromic surveillance team was tasked with reporting possible health effects from the fire. Fire, asthma, and heat-related data were monitored until the fire was reported as 98% contained. The team prepared and distributed a daily special summary report to key stakeholders in the LAC Department of Public Health (DPH).

OBJECTIVE

To detect increases in health complaints resulting from the July 2016 Sand Fire near Santa Clarita, CA using syndromic surveillance and complementary systems.

METHODS

The data sources utilized were: 1) Emergency Department (ED) visits, 2) Volume from 19 Reddinet hospitals (Hospital admissions, ED visits, ICU admissions, and ED deaths), 3) Local temperatures from the Weather Underground website, 4) Air quality for the Santa Clarita Valley from the South Coast Air Quality Management District (AQMD), 5) Over-the-counter medication sales, and 6) Nurse call hotline.

Emergency department (ED) data were queried for cases related to fire, asthma, cardiac events, eye irritation, heat, and total volume. Queries were conducted on all participating syndromic EDs in LAC and also restricted to nine EDs closest to the fire. The resulting line lists were reviewed daily to rule out visits that were unrelated to the Sand Fire. The fire query was refined periodically with additional exclusion terms.

Chief complaint, diagnosis, and triage note fields were searched separately for the following groups of terms:

Wildfire: *smoke inhalation, fire,* and '*sand fire'*

Asthma: *asthma, COPD, shortness of breath,* and *difficulty breathing*

Heat: *heat exposure, heat stroke, heat rash, sun stroke, overheat, hyperthermia, feel hot,* and *hot radiation*

RESULTS

There were 48 syndromic ED patient records with direct mention of the fire in LAC's syndromic hospitals in 13 days. Of these, 22 were asthma cases, and 32 came from the nine hospitals in the Sand Fire region; 32 were identified from the chief complaint, six by diagnosis, and ten by triage note.
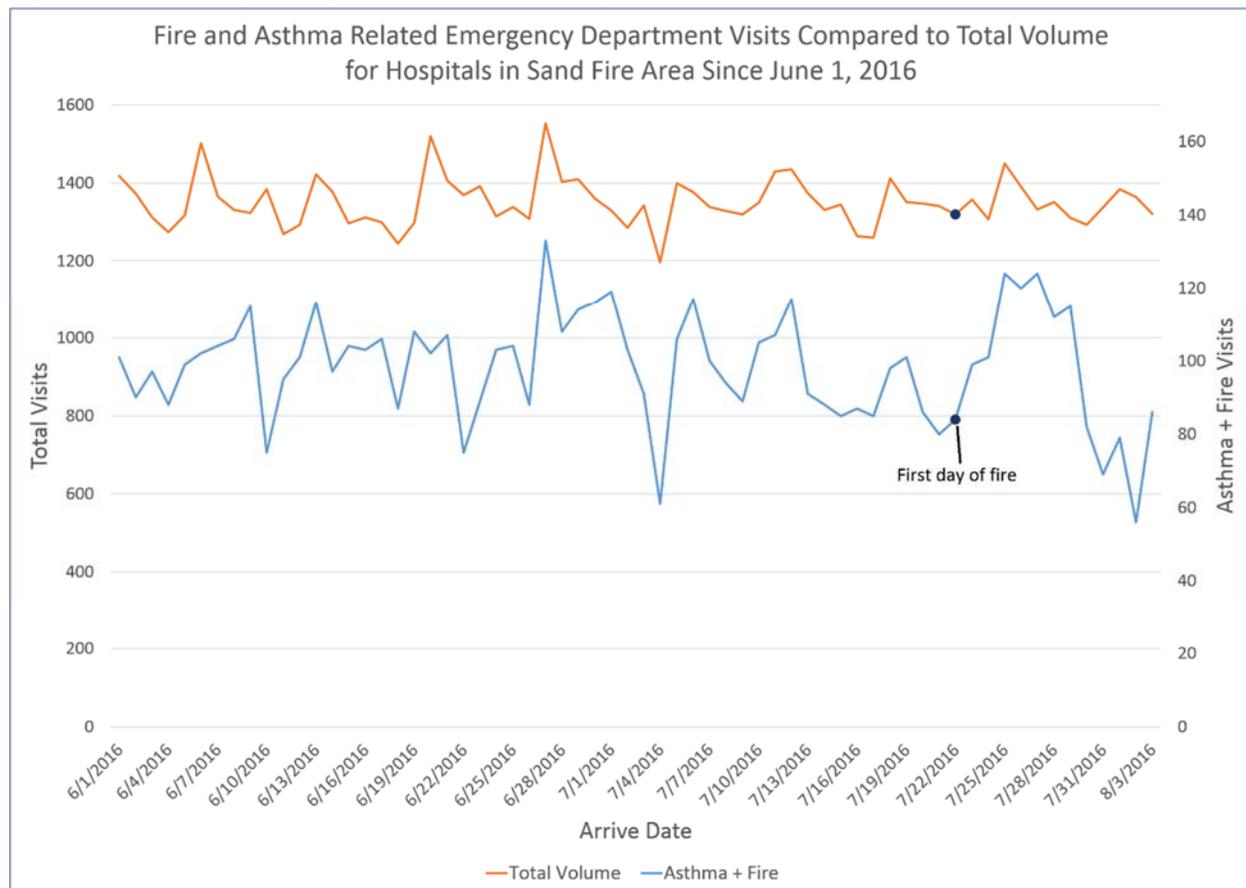
Despite an increase in fire-related visits, overall trends in ED data were not affected (Figure 1). No increase was found for cardiac events, eye irritation, heat-related illness or total volume. Asthma visits increased at the time of the fire, which correlates with a sharp increase in the concentration of fine particulate matter in the Santa Clarita Valley following the start of the fire [2].

The trend in asthma visits increased around the time of the fire (Figure 1) but had been high earlier in the summer as well, which may be partially attributable to the fact that LAC was experiencing an overall decline in air quality during the summer [3].

No increases in calls to a nurse hotline or over-the-counter medication sales were observed. Among Reddinet hospitals, admissions increased slightly, but ED visits remained unchanged.

Figure 1. Trend Graph of Syndromic Data for Hospitals in the Sand Fire Area

Fire and Asthma Related Emergency Department Visits Compared to Total Volume for Hospitals in Sand Fire Area Since June 1, 2016

DISCUSSION

ED volume alone was not enough to estimate the subsequent health effects on residents of LAC; instead, a specific query was needed. Distinguishing between asthma increases from air pollution and those exacerbated by wildfire smoke in a region where air quality is already compromised is challenging. Residents may have heeded warnings about air quality during active fires, thus reducing their outdoor exposure. Most cases were identified using chief complaints. However, additional data fields such as triage notes available from some hospitals improved the ability to elicit fire-related visits. Syndromic

surveillance and complementary systems continue to be the primary tools for near real-time assessments in LAC.

REFERENCES

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3. Barboza T. SoCal hit with worst smog in years as hot, stagnant weather brings surge in hospital visits. Los Angeles Times [Internet]. 2016 Aug 11 [cited 2016 Aug 19]; L.A. Now. Available from: http://www.latimes.com/local/lanow/la-me-ln-summer-smog-20160805-snap-story.html.