

Real-Time Geographic Tracking of Respiratory Symptoms Related to Wildland Fires, San Diego

BACKGROUND In October 2003, many Southern Californian communities were ravaged by the worst firestorm in the state's history. According to the California Department of Forestry and Fire Protection, San Diego suffered the most devastation of any community when the Cedar Fire destroyed more than 2,200 homes and burned approximately 280,000 acres of land. The tragedy caused 14 deaths, including one firefighter. During the fires, the San Diego Medical Services Enterprise (SDMSE) used FirstWatch™ to monitor incoming 9-1-1 calls related to breathing problems. FirstWatch was able to help track and respond to fire-related respiratory problems by alerting the appropriate emergency personnel to clusters of symptoms. As a result, the City of San Diego issued an alert to residents to stay indoors because of the hazardous air quality.

SUMMARY Three days after the firestorm began, FirstWatch alerted emergency staff to a 110 percent increase in respiratory problems handled by EMS crews. Respiratory cases, which normally represent 12 percent to 15 percent of the entire city's call volume, increased to 33 percent during this time. Due to this emergency, FirstWatch produced a map that showed breathing cases clustered in the midwestern section of the city, the direction in which the wind was carrying the majority of smoke. As soon as FirstWatch alerted emergency staff, steps were taken to re-deploy EMS units to the high cluster areas. Also, county health officials advised individuals with asthma and other respiratory conditions to continue to stay indoors.

MONITORING THE EVENT: During the fires, when emergency resources were stretched thin, FirstWatch allowed emergency staff to anticipate the next cluster area, says Wayne Johnson, Chief Operating Officer of San Diego Medical Services Enterprise. "We watched and graphed it on the map," Johnson says. "Then we deployed back-up units to the next place where [the call clusters] would occur."

ABOUT FIRSTWATCH FirstWatch is an early warning biosurveillance system used to monitor 9-1-1 calls in real time for a stealth biological attack or other user defined event, such as respiratory problems related to a fire outbreak. Specific software settings allow a user to accurately track respiratory-related 9-1-1 calls as soon as they get to the call center. FirstWatch now protects more than 8 million people across 10 states.

TECHNICAL FEATURE: FirstWatch integrates GIS (Geographic Information System) technology that stores, retrieves and manipulates incoming data in such a way that events can be displayed instantaneously on local and regional maps. This technology can quickly pinpoint unusual trends and cluster activity, detecting respiratory distress during wildfires or sick cases during the flu season.

MODES OF ALERT: The FirstWatch system automatically contacts predesignated recipients via fax, e-mail, phone, pagers and cellular phone text messaging in the event of an alert. SDMSE staff members notified of alerts via pagers.



NASA MODIS satellite image showing smoke pattern during wildfires (left). Inset area (right) shows FirstWatch MAPSHOT indicating simultaneous geographic clustering of respiratory symptoms in San Diego metro area.

EMS SYSTEM PROFILE Founded in 1997, SDMSE was created through a joint partnership between the City's San Diego Fire-Rescue Department and Rural/Metro of San Diego, Inc., a private EMS company. SDMSE services a population of 1,254,000 people across 331 square miles. Its EMS system is comprised of 286 paramedics, and 43 ambulances. SDMSE is responsible for approximately 83,000 calls annually and installed FirstWatch in late September 2003.

TRIGGER SETS IN USE: Abdominal pain; breathing difficulty; convulsions/seizures; unconscious (non-trauma) patients.

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