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2020 California Wildfires: Case Study

Introduction

The California wildfires in 2020 began as a result of a summer storm that produced between 300 and 3,000 lightning strikes during a period of less than 24 hours, resulting in the start of 10,000 fires over the course of the year, which ultimately burned over 4.2 million acres across the state and was the largest fire season in California's history.[1-7] Since then, it's led to the state's reevaluation of firefighting response, in addition to reconsidering emergency protocols due to California's climatological changes in recent years.[6]

Facts of the case

On the night of August 15, 2020, over 300 lightning strikes occurred throughout various parts of Northern California, which triggered a siege of uncontrollable wildfires. Due to the unique climate of Northern California, summer storms are almost unheard of, and the intense lightning strikes were attributed to a multiple-week-long record-breaking heat wave. On August 19, 2020, California Governor Gavin Newsom reported that the state was battling over 367 active fires.[7] Over the course of the next four months, over 4.2 million acres were burned, destroying over 10,000 structures and claiming 31 lives.[6]

While there were numerous massive fires throughout the state, the Santa Clara Unit (SCU) and Sonoma-Lake-Napa Unit (LNU) lightning complex fires are ranked among the largest fires on record.[6] The estimated cost of damage was at a range of $10 to 20 billion dollars.[4]

Epidemiological Aspects of the event

During active wildfires, dangerous chemicals leach into nearby drinking water, in addition to contributing to extremely poor air quality. Coupled with excessive heat warnings, the newness and uncertainty of the COVID-19 pandemic, and constant smoky air, Californians were at heightened risk for catastrophic health effects. Furthermore, out of fear of increased cost and fire danger despite extreme heat warnings, insurance companies frequently canceled homeowner policies or preemptively shut off power to tens of thousands of residents. In addition, Pacific Gas and Electric (PG&E) shut off power to over 170,000 customers.[3]

Firefighters specifically are at a high risk of developing cancer or lung problems later in life due to constant smoke exposure. As the number of climate change-related disasters increases, so does the increase in exposure to harmful levels of toxic smoke and the need for increased wildfire fighters. Recently, an increasing number of wildfire firefighters have been diagnosed with myeloid leukemia in their 20s, 70% of whom die within five years of diagnosis.[2]

The emotional and financial cost for California residents will continue to ripple throughout the life course, as many residents may experience healthcare debt in response to the severity of smoke and ash inhalation, and the complete understanding of effects won't be fully understood until years to come.

Management of the event

Given that the fires occurred six months after the outbreak of COVID-19, the health management in the aftermath of the fires was unhinged, and resources were stretched to their limits. Public health messaging during the height of the wildfires was challenging to disseminate, as masks frequently became unavailable, and mask recommendations differed depending on whether mask wearers were preventing the inhalation of smoke or preventing the spread of COVID-19.

Schools around the state also faced a challenging time simultaneously managing the pandemic and heightened fire danger, with many high schools canceling the first week of classes and developing makeshift shelters in school gyms, while also encouraging evacuees to remain six feet apart and wear masks.[1]

Since then, the California governor's office released a report last month regarding what the state's wildfire department has learned and implemented since the fires five years ago. Staffing and resources have expanded, in addition to adding over 2,500 permanent employees to the California Department of Forestry and Fire Protection (CalFire), including the extension of seasonal employee durations.[6] The state has also increased funding towards firefighting efforts and has utilized new technology, such as drone surveillance and AI, to survey and examine the full extent of active wildfires. Through this increased surveillance, many new tools have rapidly detected active wildfires, beating 911 calls by over 30% of the time.[5-6]

Utilizing new software, in addition to learning to juggle numerous major crises at once, is a skill to be learned and implemented with CalFire, healthcare providers, and within schools, to try and mitigate the emotional and financial toll on residents of all ages.

Communications of the event

Communication protocols to California residents have been generally highly effective, with evacuation warnings and orders being communicated to the general public. Utilizing text notifications and mapping software on the CalFire website to determine which neighborhoods are in fire evacuation zones, in addition to providing resources on items for evacuees to bring, and steps to prepare for potential evacuation or power shutoffs,[6] is crucial.

However, many Californians may have experienced information overload as they tried to manage rapidly changing COVID-19 protocols, in addition to ensuring their wildfire safety. Also, given that Spanish is widely spoken throughout the state, it's challenging to know whether every emergency communication was equitably distributed to non-English speakers.

Summary

The wildfires in 2020 were a landmark event for the state of California, and served as a massive learning curve in terms of health provision in times of extreme climate events and wildfire preparedness.

References

1. Browning, K., Cowan, J., Fortin, J., Fountain, H., & Tompkins, L. (2020, August 24). Scope of California Wildfires Is Staggering. *The New York Times*. https://www.nytimes.com/2020/08/24/us/california-fires.html

2. Dreier, H. (2025, September 7). 'If I Live to 25, I've Lived a Good Life.' *The New York Times*. https://www.nytimes.com/2025/09/07/us/wildfire-firefighter-cancer.html

3. Fuller, T., & Flavelle, C. (2020, September 10). A Climate Reckoning in Fire-Stricken California. *The New York Times*. https://www.nytimes.com/2020/09/10/us/climate-change-california-wildfires.html

4. NCEI.Monitoring.Info@noaa.gov. (n.d.). *Billion-Dollar Weather and Climate Disasters | National Centers for Environmental Information (NCEI)*. https://www.ncei.noaa.gov/access/billions/state-summary/CA

5. Villasenor, D. (2025, April 9). *Here's how California has increased wildfire response and forest management in the face of a hotter, drier climate | Governor of California*. Governor of California. https://www.gov.ca.gov/2025/01/13/california-forest-management-hotter-drier-climate/

6. Villasenor, D. (2025, August 15). Five years since devastating 2020 fire siege: here's how California is better prepared for catastrophic wildfire | Governor of California. Governor of California. https://www.gov.ca.gov/2025/08/15/five-years-since-devastating-2020-fire-siege-heres-how-california-is-better-prepared-for-catastrophic-wildfire/

7. 2020 Fire Season Incident Archive | CAL FIRE. (n.d.). https://www.fire.ca.gov/incidents/2020