

Fires and their smouldering health effects

In January, 2025, six wildfires broke out and spread rapidly across the greater Los Angeles region in California, USA. Fanned by the strong Santa Ana winds, these raging infernos have caused unprecedented devastation, with almost 40 000 acres burned, more than 12 000 buildings and other structures destroyed, entire neighbourhoods decimated, at least 27 people killed and thousands more made homeless, as well as immeasurable losses of vegetation and wildlife. At the time of writing, the two largest fires are still not completely contained. But, even after the fires have been extinguished, and the people of Los Angeles and the other affected cities and towns can begin the mammoth task of clearing up and rebuilding their homes, the serious health consequences of this disaster will be felt in the years to come.

The most immediate health dangers from the fires come from the fine particulate matter (PM_{2.5}), which accounts for around 90% of the particle mass in wildfire smoke. These tiny particles can be inhaled deep into the lungs, triggering health conditions including asthma attacks and bronchitis, and increasing the risk of lung cancer. WHO's recommended safe air quality guideline for PM_{2.5} is 5 µg/m³, but fires can substantially increase these levels. One study showed that a quarter of the USA's PM_{2.5} pollution is caused by wildfire smoke—a proportion that is closer to 50% in western regions, including California. As fires burn through plastics, metals, and electronics, toxic substances are released into the air, including volatile organic compounds such as benzene—a known carcinogen. The destruction of buildings, many of which were built decades ago, releases unknown quantities of asbestos fibres—the primary cause of mesothelioma—into the air. Strong winds can carry the soot, ash, smoke, and asbestos fibres for many miles, exposing people to potentially carcinogenic toxins far beyond the limits of the fire-ravaged areas. A study measuring the long-term effects of wildfires on more than 2 million people in Canada showed that wildfire exposure was associated with an increased incidence of lung cancer and brain tumours.

Residents of the fire-stricken region have been advised to monitor air quality, remain indoors where possible, and wear protective N-95 masks when outdoors. But the firefighters battling the flames are at a constantly elevated risk of damage to their health. **In July, 2022, WHO officially classified occupational exposure as a firefighter**

as carcinogenic to humans (Group 1). 23 years on from the 9/11 terrorist atrocities, 370 firefighters who attended the World Trade Centre attacks have since died from illnesses caused by exposure to toxins during rescue and recovery efforts (exceeding the number of firefighters killed on the day itself), including deaths from cancer. **Similar reports have emerged among firefighters who attended the Grenfell Tower (London, UK) fire in June, 2017, with 136 of the firefighters exposed to the toxic smoke now suffering from long-term health problems, including 11 cancer cases.** Following 9/11, a life-long health monitoring programme was set up in the USA for the emergency responders, enabling early diagnosis and treatment of cancers and other diseases, but no such support exists for the UK Grenfell Tower firefighters. Elsewhere in the world, in recognition of the high occupational health risks associated with firefighting, several regions have expanded their health insurance coverage (presumptive care) for various cancers in firefighters, including in Western Australia and in Ontario, Canada.

As the world spirals further into a climate emergency, the severity and frequency of wildfires will, unfortunately, only increase, which, combined with other sources of air pollution, will add to the growing burden of attributable health problems. Robust medical systems and strong political leadership are needed. In Europe, the European Commission's Zero Pollution Action Plan has contributed to a 45% reduction in the number of premature deaths in the EU attributable to PM_{2.5} between 2005 and 2022. And in January, 2025, Thailand's Prime Minister, Paetongtarn Shinawatra, ordered her Cabinet to intensify efforts to tackle rising PM_{2.5} pollution, through tighter regulations on crop burning and enforcing emission controls on large vehicles. However, in the USA, as the Los Angeles fires continue to exert their toll, President Donald Trump has provided little meaningful input on the fires, beyond referring to Californian politicians as "incompetent" for not extinguishing the flames more quickly. The new Trump administration urgently needs to take a different, more supportive perspective, and one that is rooted in established scientific knowledge, to properly address this crisis. Otherwise, the grim ramifications of wildfires—both the 2025 Los Angeles fires and others that will inevitably occur in the USA in the coming years—will be even more difficult to bear. ■ *The Lancet Oncology*



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For more on the **Los Angeles wildfires** see <https://www.bbc.co.uk/news/topics/cjyq4rd3x3zt>

For more on **how wildfire smoke harms health** see <https://www.newsweek.com/california-wildfire-smoke-harms-health-pm25-2012382>

For more on **PM_{2.5} wildfire pollution in the USA** see *Proc Natl Acad Sci USA* 2021; **118**: e2011048118

For the **study on cancer after wildfires** see *Articles Lancet Planet Health* 2022; **6**: e400–09

For more on **WHO's classification of firefighting as carcinogenic** see *News Lancet Oncol* 2023; **24**: e73

For more on **9/11 firefighter deaths** see <https://abcnews.go.com/US/fdny-members-died-world-trade-center-illnesses-killed/story?id=113517792>

For the **Grenfell Tower report** see *J Occup Environ Med* 2025; **67**: e12–21

For more on **cancer coverage for firefighters in Western Australia** see *News Lancet Oncol* 2023; **24**: 960

For more on **cancer coverage for firefighters in Ontario** see <https://news.ontario.ca/en/release/1005381/ontario-expanding-cancer-coverage-for-firefighters>

For more on **reductions in premature deaths due to PM_{2.5} in Europe** see <https://www.eea.europa.eu/en/analysis/indicators/health-impacts-of-exposure-to>

For **Thailand's new policies** see <https://www.pattaymail.com/thailandnews/prime-minister-orders-urgent-action-on-pm-2-5-pollution-486613>

For more on **President Donald Trump's comments** see <https://www.nytimes.com/2025/01/12/us/trump-los-angeles-fire-newsom-bass.html>

For more on the **health consequences of wildfires and political action needed** see *Editorial Lancet* 2025; **405**: 273