

Testimony of Afif El-Hasan MD to the Congressional Subcommittee on the Environment on 8/20/2019 :

Good morning, my name is Afif El-Hasan and I have been a pediatrician in Orange County for 23 years. I have an active interest in asthma, and I take care of many pediatric asthma patients. I'm also a volunteer and Governing Board member for the American Lung Association in California.

The impacts of climate change on creating or worsening natural disasters are unfortunately clearer than ever. I would like to focus my time on the human toll from the wild fires in California in the last few years.

Wildfires can cause significant air pollution, and the type of particles that come from wildfires can vary. Factors that influence the content of the air pollution from wildfires includes the type of vegetation that is burning, the temperature of the fire, and the other man-made objects that also burn during wildfires. The smoke can contain carbon monoxide, carcinogens, and most importantly, particulate matter.

Particulate matter comes in many sizes, but the particulate matter from wood smoke is an especially fine type of particle (0.4 to 0.7 microns in size). The small size of the particulates allows them to bypass many of the defenses of the lungs to infiltrate the alveoli. These particles can then pass into the blood stream, which allows them to affect the other parts of the body. The particles are linked to asthma, lung disease, heart attacks, strokes and arrhythmias. They can cause neurological problems and cancers. This is an important point when dealing with any source of fine particles, whether it is the exhaust from a diesel engine or from a wildfire. These particles are a danger to the entire body, not just the lungs.

Please also note that an area that has experienced a wildfire will also continue to shed fine particles after the fire has resolved due to the presence of ash. Anyone who has walked through an area that has been subject to a fire will know that they can still smell ash for days if not weeks after the fire has been snuffed out.

There is disturbing data from the California wildfires in 2017 regarding the PM 2.5 particles, which are the particles that measure an average of 2.5 microns in size and are the most dangerous to the body. The 24-hour air quality standard set by the EPA for PM 2.5 is 35 micrograms per cubic meter. The Sonoma-Napa wildfire in 2017 had a measurement of 200 micrograms per cubic meter, and a measurement of 70 micrograms per cubic meter was noted in Oakland during that time. The bottom line is that the wildfires can increase the amount of toxic particles in the

surrounding area by multiples of the safe levels, and can significantly affect areas farther away from the fires.

Carbon monoxide, which can kill quickly, is another pollutant from the wildfires and is an especially serious threat to firefighters since it is impractical for them to wear self-contained breathing apparatus while fighting wildfires. Local residents are also in danger of carbon monoxide poisoning from intense wildfire activity.

As a pediatrician in Southern California, I have witnessed the effects of the wildfires in my area. During these periods of time, I have seen dramatic increases in asthma attacks. I have also seen respiratory problems like pneumonias and sinus infections in children with no prior health issues. It has become necessary for me to start prescribing or increase dosage of preventative asthma medications for my asthma patients during wildfires, due to the dangers of these fires to the asthmatic patients.

The wildfire season is also a time when children are outside playing sports. Increased pollution in the air forces children to choose between playing in polluted air and remaining sedentary within the house. There is already an issue of many areas of poor air quality throughout California, which has taken a toll on the health of the people in this state. The wildfires only contribute to the problem.

Some ways to mitigate some of the harm from the increased air pollution from wildfires are to close the windows of houses, use asthma medications as needed, and drive a car with the windows closed. But these actions can't completely protect my patients from the pollution. And in addition, all of these actions cost money. It is expensive to run an air conditioner and not everyone can afford a car. Treatment of asthma and other respiratory conditions involves buying medication and possibly taking time off from work or school. Protecting your health after a wildfire can be a costly endeavor even if there is no property damage from the fire. The underserved can often have a greater and costlier impact to their lives and health as a result of the wildfires due to the lack of resources to shield themselves from the health impacts of the worsened air quality.

I would like to thank you for your time and your partnership in helping the people of this state to protect their health and well-being during these unfortunate disasters.

