although they may experience temporary eye and throat irritation when particle levels are elevated. Decreasing activity will help to minimize possible impacts. Pregnant women should also limit both the time they spend outdoors and avoid physical exertion during times of elevated particulate levels. If you have any health concerns about exposure to smoke, you should consult your medical provider.

What if I have a cardiac or respiratory ailment?

If you are around wildfire smoke and have any type of heart or lung disease, such as congestive heart failure, emphysema or asthma, try to minimize exposure to smoke. Stay inside if you are away from the fire or leave the area where smoke is present. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias.

Call your doctor to learn more about precautions you should take.

How can I protect myself and my family from wildfires and smoke?

- Evacuate from the area if you are threatened by fire, and stay indoors if there is a large amount of smoke outdoors.
- Pay attention to local air quality reports and stay alert to any news coverage or health warnings.
- If there is an air quality advisory, stay indoors and try to minimize the intrusion of smoke. Keep the windows and doors closed. Use air conditioning if it is hot outside**.** If possible, keep the fresh air intake closed and the filter clean. If it is hot and you don't have air conditioning, seek other shelter.
- Avoid using wood burning stoves or fireplaces indoors. These will generate smoke particles indoors.
- Air filters and purifiers can help reduce particle levels indoors. The type and size of the air purifiers should fit the size of the room or house. These should be in place before the fire. Do not use air purifiers that generate ozone. For more information about home air cleaners, go to www.epa.gov/iaq/pubs/residair.html. Dust masks do not provide protection and will not protect from the smaller particles. N-95 masks can provide some protection from larger particulates, but will not protect from very small particulates or toxic gasses in fires.
- Those who have heart or lung disease, older persons and children should follow their doctors' directions. Those with asthma are susceptible to attacks when exposed to smoke and particulates, and should follow their doctors' instructions regarding exposure and the use of medications. Those who meet these criteria should consider leaving any area that has heavy smoke in the air. In addition to the discomfort from the smoke, small particles in the air can cause or exacerbate long-term health issues for these populations.

The Louisiana Department of Health
Office of Public Health, Section of Environmental Epidemiology and Toxicology
(888) 293-7020
The Centers for Disease Control and Prevention
(800) 232-4636

http://emergency.cdc.gov/disasters/wildfires/

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Wildfire Smoke, Particulate Pollution and Your Health

What You Need to Know about Exposure to Smoke from Wildfires

LOUISIANA DEPARTMENT OF HEALTH

Section of Environmental Epidemiology and Toxicology

What is wildfire smoke?

Wildfire smoke is produced from the burning of grasses, trees, branches and other organic matter. It is composed primarily of particulate matter, carbon dioxide, carbon monoxide, water vapor, hydrocarbons and other organics, nitrogen oxides and trace minerals. Both the particulates and the gases in smoke contribute to environmental pollution.

Particulate Matter:

The major pollutant of concern from wildfire smoke is particulate matter. Particulate matter is a general term for any mixture of solid particles and liquid droplets found in the air, and wildfire smoke includes both large, visible particles and very small, invisible particles (2.5 micrometers or less in diameter). The small particles pose the greatest health concerns because they can reach the lower areas of the lungs, and some may even get into the bloodstream. Larger particles (10 microns and greater) will irritate the eyes, nose and throat, but they are filtered by tiny hairs in the nose and upper respiratory system and so cannot reach the areas deep in the lungs.

Gases:

The burning of organic materials in wildfires also produces gases as breakdown products. While these gases can be harmful, they are usually rapidly diluted in the outdoors and do not normally have direct human health effects.

- Carbon dioxide (CO_2) is a colorless, odorless and non-flammable gas produced both by the burning of fossil fuels (coal, natural gas and oil) and by wildfires. CO_2 is considered an environmental greenhouse gas, and wildfires can produce large amounts of CO_2 and raise the levels of this gas in the atmosphere.
- Carbon monoxide is a colorless, odorless gas produced during incomplete combustion, meaning it is generated when there is insufficient oxygen for carbon fuel to completely burn. Most carbon monoxide produced during a wildfire comes from the fire's smoldering stages. Very small amounts the gas can cause health effects, but the gas generally dilutes too rapidly for such effects to manifest during outdoor fires.
- Polyaromatic hydrocarbons (PAHs) are a large family of multi-ringed chemicals formed during the burning of coal, oil, gas, garbage or other organic substances. PAHs are found in the burnt residues after a fire and in soot, usually as a mixture containing several compounds in this category. Some PAHs are carcinogens.
- Nitrogen oxides include various gaseous compounds of nitrogen and oxygen. Many of the organic materials that burn in wildfires contain nitrogen, so several nitrogen oxides may be formed during wildfires. They are also contained in motor vehicle exhaust; produced by the burning of coal, oil, or natural gas; and created during industrial processes like welding, electroplating, engraving, and dynamic blasting. Low levels of nitrous oxides in the air can irritate your eyes, nose, throat and lungs and may cause coughing, shortness of breath, tiredness and nausea. Nitrogen oxides also contribute to environmental pollution.

How can it be predicted where wildfire smoke will go?

How much smoke a wildfire generates and how it will move depends on many factors, especially wind and weather conditions, the location of the fire, its size and the general topography of the area. Wind can alleviate smoke conditions by clearing out an area, but it can also make them worse by blowing in more smoke in or fanning the fires. After rising into the air, smoke can travel long distances, and small particles from smoke may not be visible to the eye when they finally settle. National Weather Service satellite photos, weather and wind forecasts and an understanding of local geography can all help in predicting how much smoke will come into specific location, but predictions are rarely accurate for more than a few hours. The National Weather Service provides information on smoke conditions, including satellite photos that are updated throughout the day, at www.weather.gov.

I am pretty healthy, can wildfire smoke make me sick?

High levels of wildfire smoke can make anyone sick. Even someone who is healthy may experience symptoms of smoke irritations, though many are reversible and will disappear after a few days.[7] The immediate health effects of breathing in wildfire smoke may include:

- coughing,
- trouble breathing normally,
- stinging eyes,
- a scratchy throat,
- a runny nose,
- irritated sinuses,
- wheezing and shortness of breath,
- chest pain,
- headaches,
- an asthma attack in those with asthma,
- tiredness and
- an increased heart rate.

Who is most at risk of having a health impact from exposure to wildfire smoke?

- Those with pre-existing respiratory and cardiovascular diseases are at a high risk for health effects from smoke.
- People with heart diseases, such as congestive heart failure, angina or other cardiac problems, are more susceptible to the effects of smoke.
- People with lung diseases, such as chronic obstructive pulmonary disease (COPD), emphysema or asthma, are at higher risk of breathing problems when they inhale smoke.
- Both older adults with chronic health problems and younger children are more likely to experience health problems as a result of being exposed to wildfire smoke.
- Children also are more likely to be active, which increases the inhalation of smoke particles and the associated risks.
- Smokers already have compromised lung function and exposure to high levels of particulates can exacerbate their condition, leading to chest pain, trouble breathing and other respiratory symptoms more quickly than non-smokers.

If I am briefly exposed to a thick smoke from wildfire, should I be concerned with health risk?

Not everyone who is exposed to thick wildfire smoke will have health problems. The level and duration of exposure; age; individual susceptibility, including the presence or absence of pre-existing lung or heart disease; and other factors play significant roles in determining whether or not someone will experience smoke-related health problems. Healthy children and adults have not been reported to suffer serious effects from short-term exposures to smoke,