

## ER Visits for Respiratory and Cardiovascular Problems Linked to Wildfire Smoke Exposure in Eastern North Carolina

### *What Was the Problem?*

In June 2008, a lightning strike initiated a fire in the coastal plain of North Carolina (NC), which lasted for several weeks. Burning deposits of peat produced haze and air pollution far in excess of EPA's National Ambient Air Quality Standards, encroaching on rural communities of eastern NC.

Each year NC experiences more than 100 wildfires. Two similar peat bog wildfires, started May 5 and June 19, 2011, and consumed 66,000 acres by mid-summer, impacting coastal and inland counties continuously.

### *Why is There Concern About Wildfires?*

The World Health Organization estimates that each year more than 2 million people worldwide die because of air pollution. Previous studies have examined the effects of air pollution caused by fossil fuel combustion such as pollution from car engines, coal or oil burning power plants, and diesel engines. Yet, there are very few studies that have examined health

effects that might be caused by exposure to wildfires.

The 2008 NC wildfire was a peat fire. These fires are different in that they consume underground peat (decayed vegetable matter). Peat fires tend to burn slowly and close to the ground so that the smoke is not as easily moved upward into the atmosphere. They are also very difficult to extinguish and can last for weeks or months.

EPA scientists felt it was important to determine if the health of the population of eastern NC was adversely impacted by exposure to air pollutants from peat wildfires.

### *What Was Done?*

EPA scientists conducted a study using satellite imagery to identify counties in eastern NC impacted by the 2008 wildfire, and emergency room visits for cardiac and respiratory problems in exposed and nearby unexposed counties to determine the health impact of the fire. The scientists used data from three days of dense smoke and the following five days.

The study was conducted in collaboration with researchers from the University of North Carolina at Chapel Hill, The Brody School of Medicine at East Carolina University, Pitt County Memorial Hospital and the NC Division of Public Health.

### *What are the Findings?*

This was the first study to report increased visits for symptoms of heart failure in counties exposed to wildfire smoke. The study found a 37 percent increase in emergency room visits for people with symptoms of heart failure during a three day period of dense smoke exposure and the following five days.

The EPA study also showed an increase in emergency department visits for problems relating to asthma, chronic obstructive pulmonary disease (COPD), pneumonia, and bronchitis.

The study does not examine health effects from other fires such as controlled or

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prescribed fires or other fires that burn vegetation, but not peat. Results from the NC peat fire study cannot be extrapolated to other wildfires.

The study, published in *Environmental Health Perspectives* on June 27, 2011, is entitled *Peat Bog Wildfire Smoke Exposure in Rural North Carolina is Associated with Cardiopulmonary Emergency Department Visits Assessed Through Syndromic Surveillance*.

### ***How Can People Protect Themselves?***

The particles in wildfire smoke can pose significant health concerns, especially for people with heart or lung disease, older adults, and children. EPA's color-coded Air Quality Index for particles includes general guidelines to help people reduce their exposure. Those guidelines are available at:

<http://www.epa.gov/airnow/particle/pm-color.pdf> and below:

- If air quality is Code Orange, sensitive groups (people with heart or lung disease, older adults, and children) should reduce prolonged exertion outdoors. Use common sense: if it looks and smells smoky outside, it's probably not a good time to go for a run. Take a walk

instead or consider exercising indoors.

- Pay attention to symptoms—for example, shortness of breath, airway irritation, coughing and wheezing. If you experience any of these, reduce your exposure. If symptoms are severe or persistent seek medical assistance. If you feel chest pain or discomfort lasting for more than a few minutes that comes back, particularly if associated with shortness of breath, nausea, sweating or lightheadedness seek medical assistance immediately.
- Code Red means air quality is unhealthy for everyone. If you're in one of the sensitive groups, avoid prolonged or heavy outdoor exertion. Everyone else should reduce it.
- Code Purple means air quality is very unhealthy. People with heart or lung disease, older adults, and children should avoid *all* outdoor exertion. Everyone else should avoid prolonged or heavy exertion outdoors.

#### **Additional Tips:**

- Pay attention to local air quality reports, and stay alert to any news coverage or health warnings related to smoke.

- If you have heart or lung disease, if you are an older adult, or if you have children, talk with your health care provider or your County Public Health Department about actions you can take to reduce exposure to smoke. Be sure to follow your health care provider's advice about medicines and your respiratory management plan if you have asthma or other lung disease.
- If you're advised to stay indoors, keep windows and doors closed--unless you don't have air conditioning. Keep the air conditioner on, and if your air conditioner has a fresh air intake close it. Keep the filter clean. If you do not have air conditioning and it is too warm to stay inside with the windows closed, consider seeking shelter elsewhere.
- Masks labeled "N95" (available at many home improvement stores) will offer some protection, if worn properly. Paper dust masks will not protect against particles from smoke. Masks shouldn't be a substitute for taking precautions to reduce your exposure to smoke.

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