

# Health Problems and Burning Indoor Fuels

Household air pollution means that the quality of the air inside your home is not healthy. There are a number of things that can pollute the air indoors. A common source of indoor air pollution worldwide is the fuel used for cooking and heating. When these fuels are burned, the process can cause pollution inside the home, particularly if there is not good outdoor air exchange (ventilation). This fact sheet focuses on air pollution caused by burning fuels in the home.



## How does burning fuel cause pollution in the home?

Burning of fuels inside homes generates a complex mixture of indoor air pollutants. The key air pollutants include soot and other small particles (called particulate matter) that can be breathed in and damage the lungs. Liquefied petroleum gas, natural gas, ethanol, and electricity are considered clean fuels, but not all clean fuels are equal. Some studies find that cooking with gas stoves, particularly if they are unvented, may increase indoor levels of nitrogen dioxide, causing air pollution.

Solid fuels include biomass fuel and coal. Biomass fuel includes wood, charcoal, twigs, grass, crop wastes, and dried animal dung (manure). Liquid fuels include kerosene. Solid fuels are the primary source of household air pollution worldwide.

In lower-income countries, solid fuels are used mainly for cooking. In higher-income countries and lower-income countries with cold weather, solid fuels (mainly wood) are used for heating.

## Is indoor air pollution from burning fuels an important worldwide problem?

Yes, approximately 3 billion people around the world (half the world's population) are exposed to household air pollution created from the burning of solid fuels.

Illnesses caused by household air pollution were responsible for approximately 4 million premature deaths worldwide in children and adults in 2012.

The burden of household air pollution-related lung disease may be greatest in low income countries such as sub-Saharan Africa, India, China, and southeast Asia. Although the largest disease burden is reported in low-income countries, solid fuels, primarily wood, are also used in higher-income countries. Also, byproducts of combustion from gas stoves, particularly if they are unvented, may have lung health effects as well.

## What lung problems can indoor pollution from burning fuels cause?

Household air pollution is harmful to people of all ages, and may start having a harmful impact on lung function soon after birth or even before a baby is born. The most common lung problem from household air pollution in adults is chronic bronchitis, a type of chronic obstructive pulmonary disease (COPD). Regular exposure to indoor air pollution can increase the risk for asthma, tuberculosis, interstitial lung diseases, heart disease, and lung cancer. Bronchial anthracofibrosis is also seen in adults who are exposed to household air pollution. In children, regular exposure to indoor air pollution can also increase risk for respiratory infections, such as pneumonia, which is linked with poor lung growth and development.

### *Bronchial Anthracofibrosis*

Bronchial anthracofibrosis is another airway disease related to household air pollution. In this condition, there are multiple dark black (anthracotic) discolorations and narrowing of the airways. This disease is usually seen in nonsmoking women from rural South East Asia and the Middle East.

### *Hut Lung*

'Hut lung' is an interstitial lung disease with dark black airway discoloration and fibrosis. It is reported in exposed women in lower-income countries but can occur in higher income countries. It is typically seen with long-standing exposure to poorly functioning indoor wood stoves.

### *Asthma*

Burning solid fuel may result in a higher risk of asthma. Children living in homes with high nitrogen dioxide concentration from cooking with gas stoves can have more asthma symptoms and may report increased use of asthma rescue medications.

*Effects of smoking or second-hand smoke*

Cigarette and cigar smoking worsens the effect of household air pollution on COPD and other chronic lung diseases

Additionally, about half the people living in low and middle income countries worldwide are exposed to second-hand tobacco smoke in their homes, which is also linked to respiratory problems.

**What can I do to avoid or limit indoor pollution from fuel burning?**

Anything that burns inside the house will create smoke that can damage your lungs. There are many things you can do to help protect you and your family's health from air pollution inside your home:

- Use the cleanest burning fuel you can find and afford. Electricity is the cleanest and does not create any household air pollution, followed by natural gas and propane. Of the solid fuels, charcoal may be cleaner to burn than wood, animal dung, or coal. As with solid fuels, kerosene creates a large amount of pollutants and is not recommended.
- Make sure that your kitchen has good air exchange to move stove smoke outdoors and bring fresh air in. The best ventilation is a hood above the stove with a built-in fan that blows up through a chimney to the outside. If that is not possible, then locate the cooking stove near an open window ideally with a fan in the window blowing smoke to the outside.
- A smoky kitchen should be separated from the rest of the house if possible, so that as few people as possible are exposed to the smoke.
- If you cannot cook with a clean fuel and you cannot adequately ventilate your stove, you may want to consider cooking outside of the house (e.g., in an outdoor kitchen) if that is an option.
- Make sure that the stove or furnace you use to heat your house is adequately ventilated with a chimney leading from the stove to the outside. This chimney will need to be cleaned periodically if you are burning solid fuel in the stove on a regular basis. If the chimney gets clogged with soot, the smoke can back up into your house.
- If you use an old wood stove to heat your home, consider upgrading to a newer, cleaner-burning and more efficient stove. This will improve air quality not only inside your house, but also in your neighborhood.
- Maintain your stove on a regular schedule. Use only dry wood in a wood stove.
- Make a no smoking policy for inside your house and encourage smokers to quit.

It is important that we all work together to increase awareness of the damaging health effects of household air pollution. Healthcare providers, patients, and others should support efforts to bring improvement through education, research, and changes in government policy.

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## Glossary

- ✓ **Biomass fuel** refers to any living or recently living plant and/or animal-based material that is burned by people for energy.
- ✓ **Secondhand smoke** refers to the tobacco smoke that people breathe when they are around someone who is smoking.
- ✓ **Chronic bronchitis** refers to chronic productive cough for three months in each of two successive years in a patient in whom other causes of chronic cough have been excluded.
- ✓ **Chronic obstructive pulmonary disease (COPD)** refers to emphysema and/or chronic bronchitis.

## R<sub>x</sub> Action Plan

- ✓ Improving household air pollution is important for lung health and may even prevent some new cases of COPD and lung disease in adults, and severe pneumonia in children.
- ✓ Tell family, friends, healthcare providers, and others about the dangers of burning indoor fuels
- ✓ If you must burn fuel in your home, try to have the best air exchange (ventilation) possible and the highest quality fuel you can get.

**Healthcare Provider's Contact Number:**

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## Resources

**United States Environmental Protection Agency (EPA)**

<https://www.epa.gov/indoor-air-quality-iaq/clean-cookstoves>

<https://www.epa.gov/indoor-air-quality-iaq/improving-indoor-air-quality>

**World Health Organization: Household (Indoor) Air Pollution**

<http://www.who.int/indoorair/en/>

**Global Alliance for Clean Cookstoves**

<http://cleancookstoves.org/>

**American Thoracic Society**

[www.thoracic.org/patients/](http://www.thoracic.org/patients/)

- COPD
- Prescription Medicines & OTC Medicines to Help You Stop Smoking
- Second-and-Third Hand Smoke

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