



Media centre

Household air pollution and health

Fact sheet N°292

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Key facts

- Around 3 billion people cook and heat their homes using open fires and simple stoves burning biomass (wood, animal dung and crop waste) and coal.
- Over 4 million people die prematurely from illness attributable to the household air pollution from cooking with solid fuels.
- More than 50% of premature deaths among children under 5 are due to pneumonia caused by particulate matter (soot) inhaled from household air pollution.
- 3.8 million premature deaths annually from noncommunicable diseases including stroke, ischaemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer are attributed to exposure to household air pollution.

Indoor air pollution and household energy: the forgotten 3 billion

Around 3 billion people still cook and heat their homes using solid fuels (i.e. wood, crop wastes, charcoal, coal and dung) in open fires and leaky stoves. Most are poor, and live in low- and middle-income countries.

Such inefficient cooking fuels and technologies produce high levels of household air pollution with a range of health-damaging pollutants, including small soot particles that penetrate deep into the lungs. In poorly ventilated dwellings, indoor smoke can be 100 times higher than acceptable levels for small particles. Exposure is particularly high among women and young children, who spend the most time near the domestic hearth.

Impacts on health

4.3 million people a year die prematurely from illness attributable to the household air pollution caused by the inefficient use of solid fuels (2012 data). Among these deaths:

- 12% are due to pneumonia
- 34% from stroke
- 26% from ischaemic heart disease
- 22% from chronic obstructive pulmonary disease (COPD), and
- 6% from lung cancer.

Pneumonia

Exposure to household air pollution almost doubles the risk for childhood pneumonia. Over half of deaths among children less than 5 years old from acute lower respiratory infections (ALRI) are due to particulate matter inhaled from indoor air pollution from household solid fuels (WHO, 2014).

Stroke

Nearly one quarter of all premature deaths due to stroke (i.e. about 1.4 million deaths of which half are in women) can be attributed to the chronic exposure to household air pollution caused by cooking with solid fuels.

Ischaemic heart disease

Approximately 15% of all deaths due to ischaemic heart disease, accounting for over a million premature deaths annually, can be attributed to exposure to household air pollution.

Chronic obstructive pulmonary disease

Over one third of premature deaths from chronic obstructive pulmonary disease (COPD) in adults in low- and middle-income countries are due to exposure to household air pollution. Women exposed to high levels of indoor smoke are 2.3 times as likely to suffer from COPD than women who use cleaner fuels. Among men (who already have a heightened risk of COPD due to their higher rates of smoking), exposure to indoor smoke nearly doubles (i.e. 1.9) that risk.

Lung cancer

Approximately 17% of annual premature lung cancer deaths in adults are attributable to exposure to carcinogens from household air pollution caused by cooking with solid fuels like wood, charcoal or coal. The risk for women is higher, due to their role in food preparation.

Other health impacts and risks

More generally, small particulate matter and other pollutants in indoor smoke inflame the airways and lungs, impairing immune response and reducing the oxygen-carrying capacity of the blood.

There is also evidence of links between household air pollution and low birth weight, tuberculosis, cataract, nasopharyngeal and laryngeal cancers.

Mortality from ischaemic heart disease and stroke are also affected by risk factors such as high blood pressure, unhealthy diet, lack of physical activity and smoking. Some other risks for childhood pneumonia include suboptimal breastfeeding, underweight and second-hand smoke. For lung cancer and chronic obstructive pulmonary disease, active smoking and second-hand tobacco smoke are also main risk factors.

Impacts on health equity, development and climate change

Without a substantial change in policy, the total number of people relying on solid fuels will remain largely unchanged by 2030 (World Bank, 2010). The use of polluting fuels also poses a major burden on sustainable development.

- Fuel gathering consumes considerable time for women and children, limiting other productive activities (e.g. income generation) and taking children away from school. In less secure environments, women and children are at risk of injury and violence during fuel gathering.
- Black carbon (sooty particles) and methane emitted by inefficient stove combustion are powerful climate change pollutants.
- The lack of access to electricity for at least 1.2 billion people (many of whom then use kerosene lamps for lighting) creates other health risks, e.g. burns, injuries and poisonings from fuel ingestion, as well as constraining other opportunities for health and development, e.g. studying or engaging in small crafts and trades, which require adequate lighting.

WHO's response

WHO is leading efforts to evaluate which new household cooking technologies and fuels produce the least emissions and thus are most optimal for health. WHO is also providing technical support to countries in their own evaluations and scale-up of health-promoting stove technologies.

Other WHO activities include the following:

New indoor air quality guidelines for household fuel combustion

To ensure healthy air in and around the home, WHO's new indoor air quality guidelines for household fuel combustion provide health-based recommendations about the performance of fuels, and stoves as well as strategies for the effective dissemination of such home energy technologies to protect health. These build upon existing WHO outdoor air quality guidelines and recently published WHO guidance on levels of specific indoor pollutants.

Household energy database

The WHO Household Energy Database is used to monitor global progress in the transition to cleaner fuels and improved stoves as well as contribute to assessments of disease burden from household energy and the energy access situation in developing countries.

Research and programme evaluation

WHO is working with countries, researchers and other partners to harmonize methods of evaluation across settings so that health impacts are assessed consistently and rigorously and also incorporate economic assessment of health benefits.

Leadership and advocacy in the health, energy and climate community

Health sector

WHO is working to integrate guidance and resources for supporting clean household energy into global child health initiatives and decision-support tools, such as the Global Action Plan for Pneumonia and Diarrheal Disease (GAPDD), as well as into other aspects of WHO's own health policy guidance. WHO advocates about the compelling health arguments for cleaner household energy in a range of global forums addressing maternal and child health issues related to pneumonia as well as forums concerned with noncommunicable diseases in adults.

This can help awareness of the importance of providing and scaling up of cleaner household energy as a core preventive public health measure.

Health and climate change

WHO is a partner of the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC). As a member of the CCAC's health task force, WHO is providing technical support for harnessing health benefits from actions to reduce short-lived climate pollutants, and working to scale up health sector engagement to address such pollutants and improve air quality.

Health, energy and sustainable development

WHO has proposed using reductions in air pollution-related disease burden (both for household and outdoor) as an indicator of an energy post-2015 sustainable development goal.

WHO also has contributed to the development of the tracking framework to measure progress toward the UN Secretary-General's Sustainable Energy for All initiative of universal access to clean energy.

[Health indicators of sustainable energy in the context of the Rio+20 UN Conference on Sustainable Development](#)
pdf, 239kb

Sustainable Energy for All initiative

WHO is a partner in the Global Alliance for Clean Cookstoves, led by the United Nations Foundation, and involving a range of UN agencies, donors, NGOs, civil society and country partners. The Alliance is promoting improved biomass cookstove designs that can substantially reduce indoor air pollution.

Supporting the Millennium Development Goals

- Tackling indoor air pollution will help achieve the Millennium Development Goals (MDGs), in particular MDG 4 (reduce child mortality) and MDG 5 (improve maternal health).
- It will also contribute to gender equality (MDG 3) as well as freeing women's time for income generation that helps eradicate extreme poverty and hunger (MDG 1).
- Finally, clean household energy can help ensure environmental sustainability (MDG 7). WHO reports annually on the proportion of the population using solid fuels for cooking as a key indicator for assessing progress in health and development.

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Related links

[WHO Household energy database](#)

[WHO's work on indoor air pollution](#)

[WHO's work on outdoor air pollution](#)

[Lives-Saved tool \(LiST\)](#)

[Health in the green economy](#)

[Global Alliance for Clean Cookstoves](#)

[Sustainable Energy for All Initiative](#)

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