

Health Effects of Woodsmoke. Review by Dorothy M. Bowes

Woodsmoke in the urban environment is a major source of aggravation and ill health for many people, especially those with allergy or chemical sensitivity. The toxicity of wood smoke is well known, it contains many carcinogenic substances such as aldehydes, dioxin, polycyclic aromatic hydrocarbons (PAH), carbon monoxide and ultrafine particulate matter i.e. particles that are less than 2.5 microns in diameter (PM_{2.5}). The problem with these ultrafine particles is that when they are less than 2.5 microns in diameter they are retained in the human lungs and have been shown to cause increases in morbidity and mortality. In developing countries, woodsmoke has had a serious effect on human health as some wood stoves emit smoke to indoor air.

Studies in Bogota, South America, have shown that such exposure reduces lung function, especially in children, and was responsible for a large proportion of obstructive airway disease. In Mexico City where there is also a huge motor exhaust pollution problem, women exposed to woodsmoke were shown to have a higher risk of contracting chronic bronchitis and obstructive airway disease than those who were not exposed to woodsmoke. In Africa, cooking with wood greatly increased the risk of stillbirth, while indoor air in homes with woodstoves was found to have higher levels of mutagenic material.

In developed countries studies have also found significant health effects in people who use woodstoves. In the USA, children living in homes with wood stoves tended to have higher levels of respiratory symptoms, increased incidence and severity of wheeze, more coughing and a decline in lung function.

Forest firefighters in the USA had decreased lung function after fighting fires and the use of woodstoves by these firefighters also affected their lung function. Eight out of twelve homes were also shown to have an increase in indoor mutagenicity. In New York, woodstoves were associated with middle ear problems while other studies in the USA also showed illnesses attributable to fumes from woodstoves.

In areas where airtight woodstoves are used and these are vented outside, neighbours downwind of the stoves probably have a high level of exposure that those indoors at the source of the smoke. In the USA, whole neighbourhoods have been found to suffer, while in some counties, a higher incidence of asthma admission to hospitals were reported - particularly on days of high woodsmoke pollution.

In Sydney, studies by the NSW EPA found that most of the particulate pollution in winter came from 13% of households using wood heaters. Studies also showed that death rates are generally higher in winter on days of high pollution, or days following high particle pollution.

'Woodsmoke is estimated to be 12 times more carcinogenic than an equal concentration of cigarette smoke'.....

In a laboratory study, mice were subjected to either woodsmoke, oil furnace fumes or clean air for 6 hours. They were then challenged with a streptococcus bacterium and within two weeks, 21% of the mice exposed to woodsmoke were dead compared with 5% of the mice exposed to the oil furnace fumes or clean air.

Autopsies have shown that particles less than 2.5 microns in diameter (PM2.5) are retained in human lungs. Larger particles are not retained.

The following can be caused by woodsmoke:

- obstructive airway disease
- reduced lung function
- asthma, wheezing, cough
- higher incidence of bacterial infections
- cataracts
- eye lens opacification
- bronchiolitis
- otitis media (ear inflammation)
- methemoglobinaemia (reduced oxygen in blood)
- cancer
- sore throats
- migraine
- pneumonitis
- fibrosis of the lungs
- unnecessary deaths

References.

Published Studies on the Health Effects of Woodsmoke. University of New England Air Quality Research Group. July 1998. (Also published as a refereed paper in 'Clean Air' official journal of the Clean Air Society of Aust. And NZ 32(3): August 1998 pp.37-41.

Available with references on the World Wide Web at: [Armidale Air Quality link](#)

Another good link on the effects of woodsmoke is [Lung Net - Woodsmoke Issues](#)

Our thanks to Dorothy Robinson of the Armidale Air Quality Group for this research

If you have problems with woodsmoke in your neighbourhood please write to ASEHA at PO Box 96 Margate Qld 4019 OR e-mail asehaqld@bigpond.com

We would like your case history to assist us with our research.