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Watch Out For Nasty Indoor Pollutants

We should take more care to ventilate our homes and offices well, if we want to avoid illness or even death. While clean outdoor air is important, most of us spend 80 to 90 per cent of our time indoors. So we should consider the quality of the air there too. Yet public awareness of air pollution in houses and offices lags behind that of outdoor pollutants, a recent World Health Organisation (WHO) report warns. It looks at the levels of chemicals in indoor air and what harm they can do. Understanding these chemicals is the first step in avoiding harm.

"We should look more carefully at what is going on in the indoor environment," says James McLaughlin, a physicist at University College Dublin and a member of the working group that produced the new guidelines. Some products within buildings can be a source of pollutants, he says, and can cause long-term harm. Among the chemicals in some pollutants that can cause harm are benzene, formaldehyde and carbon monoxide.

To complicate matters, the report says not everyone is equally susceptible to these gases. "Individuals vary widely in their response to exposure to chemicals. Each person has a pre-existing status – defined by, for example, age, sex, pregnancy, pulmonary disease, cardiovascular disease, genetic make-up and lifestyle," it says.

Benzene is present in furnishing materials, carpets, paints and wood panelling. It's also in tobacco smoke. New buildings have been linked with high concentrations of this cancer-causing chemical, say the guidelines. Exposure to 20,000 parts per million (ppm) for five to 10 minutes is usually fatal, and 50 to 100ppm for half an hour leads to fatigue. There is no safe level: exposure of less than one part per million has led to substantial reductions in red and white blood cells. The WHO says guidelines for exposure to benzene and other such chemicals indoors are needed.

There are basic measures you can take to help yourself, your family or your co-workers, however "As a country we don't ventilate well and this is something we should be doing," says Caitríona O'Donovan of Airmid Healthgroup, a Dublin firm that tests indoor air quality. "If you don't get enough fresh air through ventilation, you get a build up of contaminants in the air." Better ventilation and a look at what products we use indoors can go a long way to improving air quality, she says. Companies should also ensure their ventilation systems are properly maintained.

Chemicals can be released by paint, cleaning products and office equipment, putting volatile organic compounds into the air. Formaldehyde is one such compound. It's widely used in making resins, as a disinfectant and fixative and as a preservative in consumer products.

New materials and products can give off the chemical for months, especially when high temperatures are combined with high humidity. Exposure to concentrations of just 0.38mg per cubic metre of air for four hours can cause sensory irritation of the eyes. Again, proper supply of clean air is one solution. The other is to avoid products with volatile organic compounds if possible.

"There has been increasing use of things like solvents and cleaning fluids. These are often associated with volatile organic compounds and people shouldn't excessively use them," advises McLaughlin. "What happens is cleaners can come in the mornings, do lots of cleaning and spraying. Then the building doesn't have an opportunity to purge before the occupants come in and they are exposed to these chemicals."

O'Donovan's company was called into an old Georgian building after occupants complained of headaches and nausea. It discovered elevated levels of volatile organic compounds. The offices had been painted six weeks previously and the paint contained high amounts of these chemicals.

In an attempt to reduce energy costs and "green" their buildings, some companies have reduced the input of clean air. O'Donovan recently encountered a financial services company where employees on three floors complained of fatigue, extreme headaches, and increased transmission of colds and flu. High levels of carbon dioxide, volatile organic compounds and bacteria were found in the air. A contractor had adjusted the heating, ventilation and air conditioning system to save energy. True green buildings take air quality into account too, however.

"The Health and Safety Authority is super at carrying out inspections in an industrial setting," says O'Donovan, but indoor air quality systems are not regulated in the same sense.

The WHO suggests its new guidelines can be used in policy development and that "countries may wish to use the guidelines as a scientific basis for legally enforceable standards". It emphasises that some sections of society, such as those in residences, day-care centres and retirement homes are particularly vulnerable to indoor air pollution owing to their health status or age.

"The area of indoor pollution is not as fully developed as outdoor air pollution," says McLaughlin. "These guidelines are aimed at public health in people's homes, schools and offices."

CARBON MONOXIDE: DANGER IN THE HOME

Carbon monoxide is given off by the incomplete burning of fuels such as petrol, coal and gas. Faulty or poorly ventilated cooking or heating appliances are usually to blame. But the unborn and adults with heart disease or at risk of stroke are in greatest danger, according to the World Health Organisation. Its guidelines note there is also "almost certainly a group of individuals who are extraordinarily sensitive to carbon monoxide but who have no obvious health or unusual physiological conditions and thus cannot be readily identified".