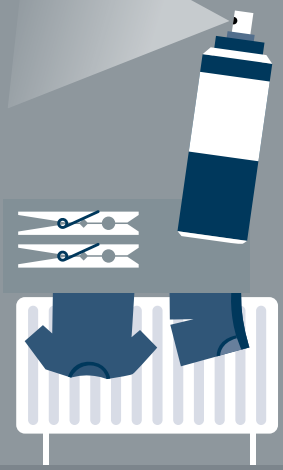
Maintaining a Healthy Home:

A Ventilation Guide for Householders on Improving Indoor Air Quality and Protecting Health.

Introduction

In 'normal' times, we spend around 90% of our time indoors[1] and around 16 hours a day on average at home.[2]

During the COVID-19 pandemic this could increase to 98% and 23.5 hours respectively, thus increasing the risk of virus transmission.



This means that our potential risk of exposure to viruses and air pollutants is significantly greater indoors than outdoors. Especially considering that indoor air can be many times more polluted than outdoor air.

Poor indoor air quality (IAQ), or indoor air pollution, is linked to a range of health conditions that contribute to a significant loss of healthy life years, premature mortality and significant cost to the NHS and wider economy.

The recent drive to improve energy efficiency in our homes, largely through insulation and double glazing measures, is welcome but reduces natural air flow and leads to an increase in indoor pollutants and a deterioration in indoor air quality.

Ventilation and air exchange will help deliver improved indoor air quality, reduce the impact of airborne viruses and have a positive impact on personal health and wellbeing.

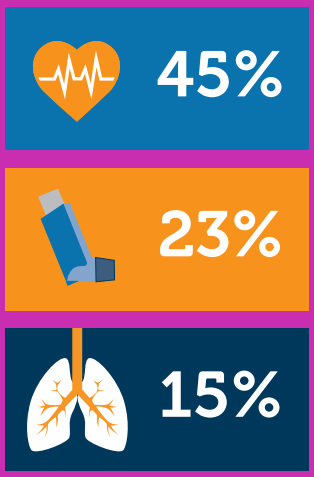
The most important thing you can do is know how your house is ventilated, ensure it is ventilated properly and keep up a good maintenance and cleaning regime.

This guide sets out to explain why maintaining good indoor air quality through ventilation is important, who is at risk, what ventilation system you have and other tips and tricks to ensure you do all you can to protect you and your family's health.

This guide also provides information on how you can install or upgrade your ventilation as part of the government's new Green Homes Grants Scheme.

1. European Commission, Joint Research Centre – Institute for Health and Consumer Protection. Report No. 23. *Ventilation, Good Indoor Air Quality and Rational Use of Energy.* 2003.
2. YouGov Consumer Survey. *Air Quality.* 2000 UK Adults. 2014.

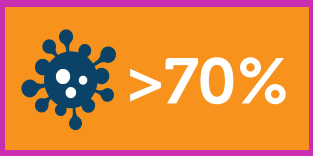
Indoor air quality and health



Poor IAQ is reported to have an annual cost to the UK of **over 204,000** healthy life years, with:

- **45%** of those lost to cardiovascular diseases,
- **23%** to asthma and allergy, and
- **15%** to lung cancer[1]

The World Health Organisation reports that indoor air pollutants are **responsible for around 99,000[2] European deaths a year** and the Royal College of Physicians warns that indoor air pollutants cause, at a minimum, thousands of deaths per year in the UK and are associated with healthcare costs in the order of "tens of millions of pounds".[3]



The Department of Health highlights how letting fresh air into indoor spaces can reduce the risk of infection from coronavirus by over 70%.

1. National Institute for Health and Welfare. Efficient reduction of indoor exposures. *Health benefits from optimizing ventilation, filtration and indoor source controls*. 2013.
2. World Health Organisation (WHO). Burden of disease from household air pollution for 2012. 2014.
3. Royal College of Physicians. Every breath we take: the lifelong impact of air pollution. Report of a working party. 2016.



Short term symptoms of poor IAQ

- Coughing
- Sneezing
- Watery eyes
- Fatigue
- Dizziness
- Headaches
- Wheezing
- Allergic reactions
- Reduced cognitive function



Longer term health effects linked to poor IAQ

- Allergic and asthmatic symptoms
- Respiratory infections and conditions
- Lung cancer
- Chronic obstructive pulmonary disease
- Cardiovascular disease
- Mental wellbeing
- Alzheimer's disease (under investigation)



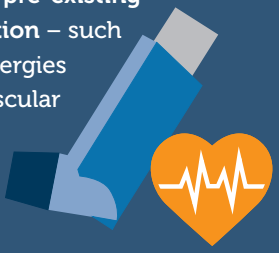
There are different types and sources of potentially harmful particles and pollutants within the home, for example:

- **Airborne virus particles** *e.g. from coronavirus.*
- **Moisture** *e.g. from washing, cooking.*
- **Carbon monoxide (CO) and oxides of nitrogen** *e.g. from combustion appliances and smoking.*
- **Volatile organic compounds (VOCs),** *e.g. from aerosols, candles, air fresheners and formaldehyde found in some furniture.*
- *Allergens e.g. from house dust mites.*
- **CO2** *e.g. from humans and also combustion appliances.*
- **Odours** *e.g. from cooking, bodies and pets.*

Who is most at risk?

Personal circumstances

Those with a pre-existing health condition – such as asthma, allergies and cardiovascular disease



Pregnant women and new mums

Older people

Those who spend considerable time at home – such as the disabled, pre-school children and those who work from home

Those who live in poor-quality housing

Tenants who may have to wait for a landlord to make repairs or renovations

Poor indoor air quality can affect everyone but **some people are more at-risk than others**, either because of their personal circumstances or because of the environment in which they live.

Building environment

Location – external factors such as high levels of outdoor air pollution

Physical infrastructure – such as small room size, inadequate ventilation (or Green Home Grant improvements without supporting ventilation) and the building's layout and orientation

Standard of housing – e.g. those with damp and mould or in physical disrepair, including flood damage

Overcrowding – homes that are overcrowded are more likely to suffer

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People who are at a higher risk of poor indoor air quality should take action to ensure that the ventilation in their home is effective, in order to help ensure good indoor air quality and health.

Home ventilation issues

Regulations

Government building regulations state the minimum levels of ventilation performance required in each home. However, awareness of regulations and ventilation requirements in the UK remains very low and many homes show evidence of the damaging effects of poor ventilation on our health. In particular, if your home has evidence of mould (usually black or discoloured patches on the walls) or if any of the occupants are suffering from respiratory or allergy problems, you should consider whether you need to improve the ventilation in your home.

Natural ventilation

Most people think about airing their homes by opening their windows but this is not done often enough and indoor air quality deteriorates very quickly when windows are closed again and airborne particles and pollutants start to accumulate. There may also be other factors which prevent opening windows for sufficient time, such as heat loss, security or pollution and noise from busy roads.

Many old buildings will ventilate naturally by air passing through the building fabric or individual ventilation devices, such as extractor fans or vents, but the air circulation levels are often very low.

Ventilation and climate change
(Energy efficiency measures)

Successive UK governments have implemented a number of measures designed to improve the energy efficiency of our homes – often by improving insulation such as through double glazing, loft insulation or cavity wall insulation. The government has recently introduced the Green Homes Grant Scheme and whilst this is good for the environment, it can lead to the accumulation of indoor air pollutants and deteriorating indoor air quality, if not carried out alongside improvements in ventilation.

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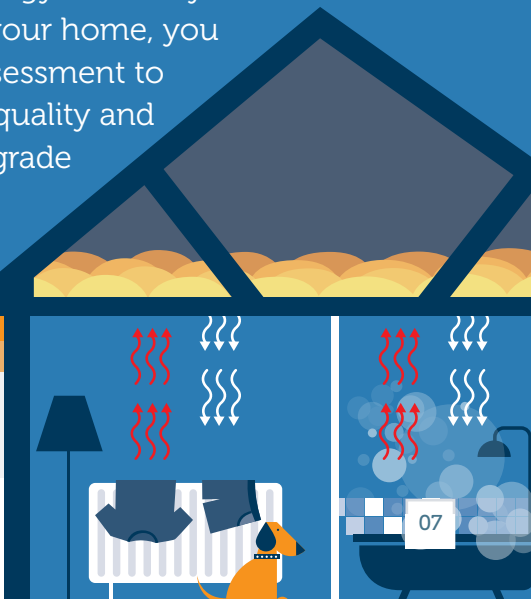
So, if you have had energy efficiency measures installed in your home, you should consider an assessment to check your indoor air quality and consider a suitable upgrade to your ventilation.



Understanding home ventilation

An ideal indoor environment for a home is one which is air-tight and well insulated, with consistent heating, matched with effective ventilation. This will ensure that moist and stale air is removed and replaced with fresh, clean air to keep you and your home healthy.

Trickle Vents

Trickle vents are small openings, usually found above window frames, and are essential for extractor fans and other forms of ventilation and air circulation to work effectively. If your home has trickle vents, it is essential that they are kept open and free of debris in order that the air can freely circulate and to prevent condensation and mould growth.

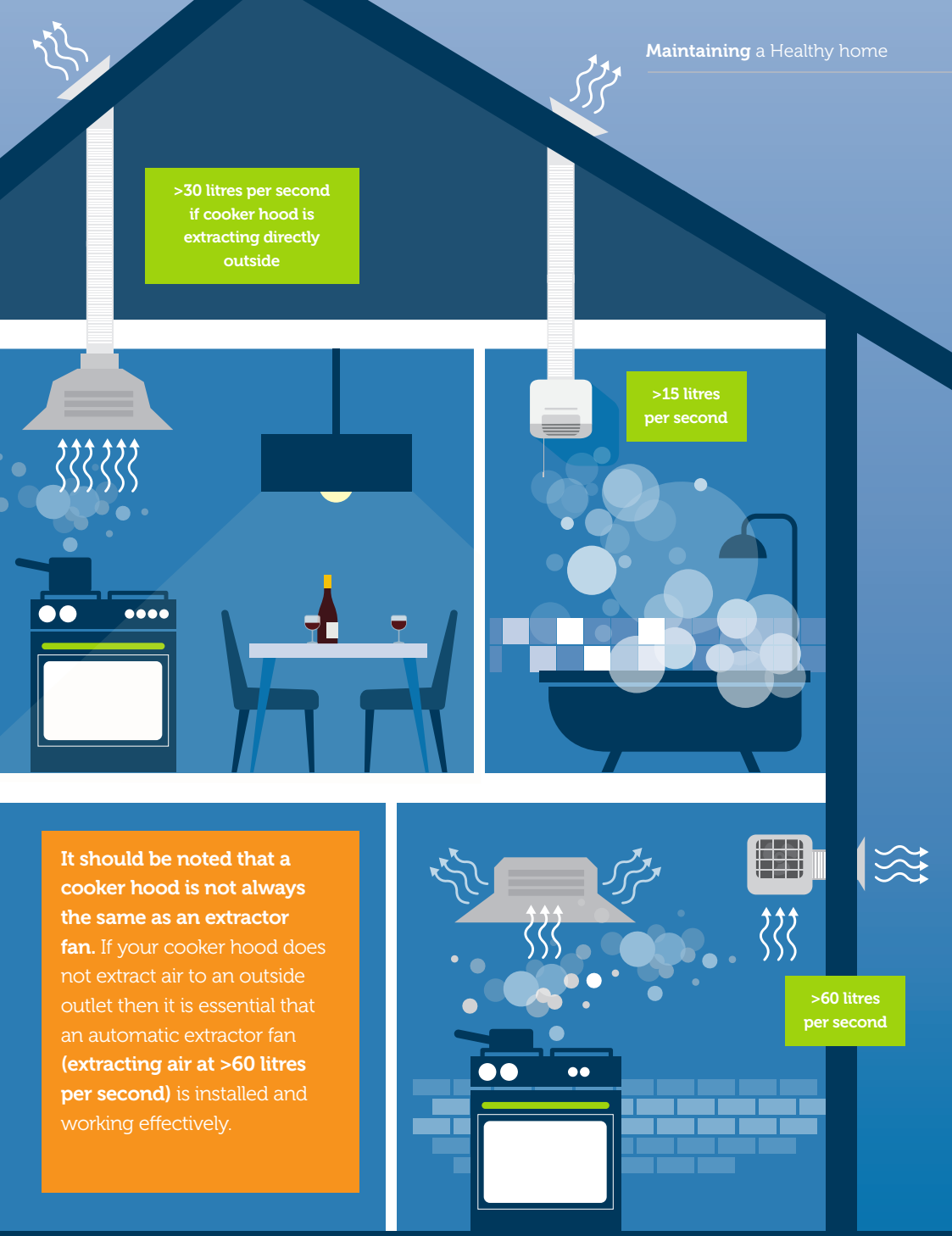
Understanding how your home is ventilated is critical to optimising your indoor air quality, preventing the onset of mould and damp and protecting health.

Extractor Fans

Damp and mould are common problems in UK homes and usually arise in areas of the house that are exposed to excessive moisture. Every bathroom, kitchen, toilet, utility or wet room should therefore have a working extractor fan. If this is not the case, or fans are not working effectively*, you should have them professionally installed or upgraded to ones that, at the very least, have in-built timers and moisture sensors.

Extractor fans provide an effective solution to preventing condensation and the onset of mould through extracting moist air and steam that is released during washing, cooking, bathing, cleaning and drying clothes.

*You can test the effectiveness of your extractor fans by holding up a piece of paper when they are turned on. If the paper doesn't stick to the fan then it should be replaced and upgraded.



It should be noted that a cooker hood is not always the same as an extractor fan. If your cooker hood does not extract air to an outside outlet then it is essential that an automatic extractor fan **(extracting air at >60 litres per second)** is installed and working effectively.

Whole Home Ventilation Systems

Whole home ventilation systems (sometimes referred to as mechanical ventilation) operate by diluting and dispersing low levels of water vapour and other pollutants and supplying fresh air to the entire house.

Mechanical ventilation with heat recovery (MVHR) is defined as the most effective, efficient and advanced whole home system and is often installed in new, very air-tight and well insulated buildings.

It is important that whole home ventilation systems are serviced and the filters cleaned regularly to ensure they are operating efficiently.

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Because ventilation is a key part of any building, the provision of ventilation systems in a home is covered by the Building Regulations, the rules by which the Government says homes must be built and renovated.

For full details of the draft building regulations in relation to ventilation please visit the government website.

Finding out more about ventilation systems

If you are thinking about having a ventilation system installed, replaced or upgraded, you can visit the industry trade body ***BEAMA's website here***. The BEAMA Ventilation group represents leading UK manufacturers and suppliers of ventilation products and equipment which deliver the highest standards of build quality and performance. The group is dedicated to improving the indoor environment of buildings through effective, low energy ventilation systems, and to improving standards of installation and commissioning.

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The BEAMA website also provides details of ventilation products that are **Green Homes Grant Scheme** complaint and meet the required standards to comply with building regulations to help improve indoor air quality and health.

For more information on the Green Homes Grant Scheme visit: MyHealthMyHome.com

Using professional installers and repairers

If you are having new ventilation installed, an old system replaced or maintained or repaired, it is strongly advised that you use a trained professional – known as a 'competent person'.

To identify a competent person, you should check to see that your installer or electrician is NICEIC trained.

NICEIC is a training body for contractors working in building services, such as electricians, renewable energy installers, plumbers and gas and heating engineers. Those registered with NICEIC are regularly assessed to ensure the work that they do is safe and installed to the highest industry standards.

NICEIC provide a 'Platinum Promise' which means that they will take necessary steps to put work right in the event that an installer is no longer registered, or has ceased trading – so long as the work was completed by a person registered with NICEIC at the time the work was completed and within the last six years.

To identify a competent person, you can use NICEIC's 'Find a contractor' service on their website:

http://www.niceic.com/householder/find-a-contractor

Ventilation FAQs

Q: How important is an effective ventilation system in my home?

A: Having an effective ventilation system is essential in every home. The system will be extracting moisture and removing particles and pollutants in the air, such as dust mites or VOCs, which if not removed will be detrimental to health. A family of 4 can create as much as 24 pints of moisture in a day and this needs to be extracted, otherwise issues such as mould and damp can result in damage with costly consequences.

Q: How cost-effective is installing a mechanical or MVHR system into my home?

A: A MVHR system can help save money on a home's heating bill by recovering heat from the extracted air. Moreover, as new air from outside is brought in, the heat is collected to temper the air supplied. During summer, MVHR systems operate a summer bypass to extract tempered air into the atmosphere, helping to keep the home cooler.

Q: If an extractor fan in my home is not working, how long is it safe to leave it before fixing?

A: If your cooker hood or extractor fan is not working, it is important to check that the filters are clean. If the issue persists, then it is essential that you purchase a new one straight away to prevent further damage to your home and potential damage to your health, as your home will not be ventilated properly.

Q: Do extractor fans need to be on all the time or can I switch them off?

A: Extractor fans should be on when needed. If extractor fans are not switched on, the property will not be adequately ventilated. Most fans that are intermittent will turn themselves off after a period of time and you should not be using the isolator switch as an on/off switch.

Q: The fans in my ventilation system seem to be noisy, is this normal?

A: Fans should not be noisy to the extent that they are a nuisance. Ventilation systems that are noisy may have been installed incorrectly or it may be time for a service. Fans will need regular maintenance in order to work effectively and reduce sound output.

Q: How often should I maintain my system?

A: It is important to ensure that filters in your ventilation unit are regularly cleaned and maintained. Ventilation systems should be serviced once every year due to the collection of dust and debris around motors, air valves, ducting, fans and heat exchangers – which affects the efficiency and effectiveness of the system. Servicing should be completed by a trained professional, who will service all working parts and recommission the system to make sure that the correct extract and supply rates are being achieved.

Other useful tips to combat poor indoor air quality

In addition to understanding, using and maintaining your home's ventilation system, you may want to consider other things you can do to help reduce your exposure to poor indoor air quality. **By taking these actions, you can help to reduce the number of pollutants in your home, helping to prevent them from accumulating.**

Behaviour	Risk	Remedy
Mattresses 	Mattresses can harbour house dust mites	Avoid using second-hand mattresses, make sure you use barriers such as mattress and pillow covers or protectors and ensure you frequently wash bedding
Drying clothes 	Moisture from drying clothes can contribute to the development of black mould	Where possible, always dry your clothes outside or if you have to, dry them in a room with good ventilation, and keep the door shut.
Cooking 	Cooking on the hob can often release significant amounts of moisture into your kitchen	Cover pans with lids to ensure that as little moisture is released into the air as possible and be sure to use your extractor fan while cooking. **Please note:** *If your cooker hood does not extract air to an outside outlet then you should ensure that your kitchen also has an extractor fan which extracts air at >60 litres/second.*

Behaviour	Risk	Remedy
Shower curtains 	Shower curtains can become mouldy	Make sure you clean or change your shower curtain regularly and avoid those made of vinyl as the material harbours moisture, promoting mould growth
Flooring 	Carpets can harbour dirt, dust mites, pet hair, fungus and other particles.	Consider switching to wooden flooring, which is easier to keep clean, or vacuum regularly with a vacuum that has high quality filtration
Deodorant 	Aerosols can be bad for your indoor air quality, as they release particles into the air	Consider using roll-ons instead of aerosols which release far fewer pollutants into the air
Shoes 	Wearing shoes inside can bring pollen, dirt, soil and other particles into your home	Take your shoes off at the door, so as to stop particles being spread around
Paint 	Drying paint can give off high levels of VOC	Ensure that while paint is drying, your home is very well ventilated and avoid occupying the rooms whilst paint is drying
Cleaning products 	Some personal and household products can contain toxins or chemicals which release toxins when they react in the air	Switching to eco-friendly products can help to reduce exposure, as often these do not have toxins inside them and are therefore better for your indoor air quality

For more information, visit:
beama.org.uk

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