

Advising Patients on the Health Impacts of Poor Indoor Air Quality at Home

A guide for healthcare professionals and public health practitioners, based upon 2020 NICE Guidance on Indoor Air Quality at Home.





Poor indoor air quality (IAQ), or indoor air pollution, is linked to a range of health conditions and is responsible for a significant loss of healthy life years, loss of life and disease burden.



NICE National Institute for Health and Care Excellence



The recommendations included within this guide are based upon **new NICE Guidelines** on indoor air quality in residential buildings, NG149, published in January 2020. They are designed to help healthcare professionals assess at-risk patients and their living environments and provide advice for improving health via the control of indoor air pollution and improved ventilation.

<https://www.nice.org.uk/guidance/ng149>



UK citizens spend approximately **90% of their time indoors**,¹ with **16 hours a day** on average spent at home.²

This means that individual risk of exposure to indoor air pollutants is many times that of outdoor air pollution and this is exacerbated by the fact that indoor air can be many times more polluted than outdoor air.³



Poor IAQ has been linked to **allergy and asthma, lung cancer, COPD, cardiovascular disease, dementia** and, more recently, **severe COVID-19 symptoms and greater risk of death** have been associated with poor air quality.^{4,5,6}

Ongoing research is looking at the impact of poor ventilation rates on disease transmission⁷ whilst new research is being undertaken on the impact of poor IAQ on mental health, following research in schools which indicates that cognitive function is impaired where air quality is poor.⁸



45%
cardiovascular
diseases

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 cancer⁹

and, according to the Royal College of Physicians, indoor air pollutants cause thousands of deaths per year in the UK, with associated healthcare costs in the order of **"tens of millions of pounds"**.¹⁰



23%
asthma and
allergy



15%
lung
cancer

What is poor indoor air quality (IAQ) or indoor air pollution

Poor IAQ occurs when there is a build up of pollutants in the home to the extent that it affects an occupant's health and comfort, either in the short or long term.

Pollutants include:

- Particulate matter (PM)
- Carbon Monoxide (CO)
- Mould
- Dust mites and other biological particulates
- Nitrogen Dioxide (NO₂)
- Sulphur Dioxide (SO₂)
- Volatile Organic Compounds (VOCs)
- Formaldehyde (CH₂O)
- Radon (Rn)
- Ozone (O₃)
- Ammonia (NH₃)

What are the primary sources of indoor air pollutants?

Smoking



Heating

- Open solid-fuel fires
- Free-standing gas heaters
- Unflued paraffin heaters in the home



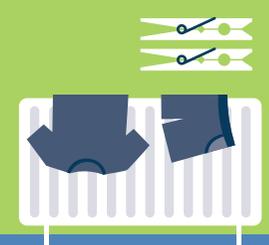
Cooking

- Cookers, especially gas cookers and those with no extraction facility



Cleaning and Drying

- Air-drying clothes in the home
- Steam from showers and baths
- Cleaning products
- Household sprays and aerosols



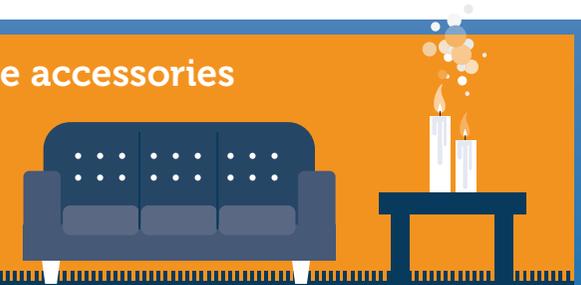
Renovation/DIY

- Paints, solvents, wood varnishes, etc. - products with high VOC or formaldehyde emissions



Furnishings and home accessories

- Furniture, carpets and certain wall coverings
- Burning of candles and incense

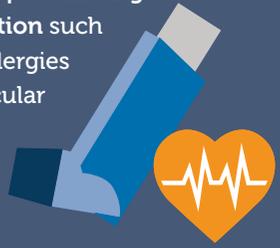


Who is most at risk of poor indoor air quality?

Poor IAQ can affect anyone, but certain groups of people are more at risk than others. These can be identified either by an individual's personal circumstances or by the environment in which they live.

At-Risk Persons

Those with a pre-existing health condition such as asthma, allergies or 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



Those living in low quality rented accommodation



If a patient is in one of the 'at-risk' groups, it is advisable to assess their living conditions and offer advice accordingly:

Living Condition Risk Factors

Location (external factors such as high levels of outdoor air pollution, or where noise or security risks mean residents do not open windows)



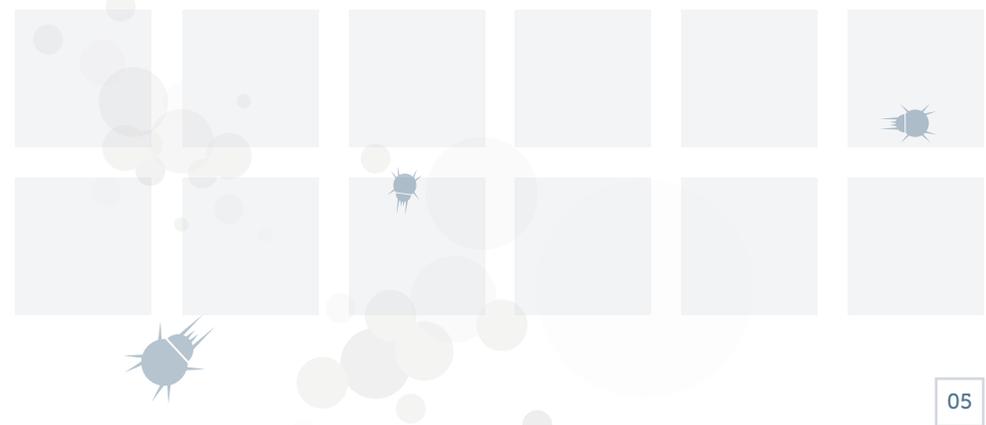
Physical infrastructure (such as small room size, inadequate ventilation and the building's layout and orientation)



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



Overcrowding

Advice for high-risk patients

Certain groups of people **are more susceptible to indoor air pollutants** and therefore at a higher risk of associated health impacts. Where this is the case, **NICE has issued specific advice for certain at-risk groups:**



Patients with asthma and other respiratory or cardiovascular conditions

In addition to the advice in this guide, those who suffer asthma and other respiratory or cardiovascular conditions should be advised that indoor air pollutants can trigger or exacerbate their condition, so they should avoid using household sprays, air fresheners or aerosols and instead use non-spray alternatives such as roll-ons.



Where a patient presents with repeated or worsening asthmatic symptoms, they should be asked about their housing conditions and, if concern is raised, be referred for a local authority housing assessment.



Further information:

- Online indoor air pollution fact sheet provided by the UK charity, British Lung Foundation:
<https://www.blf.org.uk/support-for-you/indoor-air-pollution/about-indoor-air-pollution>



Patients with allergies

In addition to the advice in the prior sections of this guide, those with allergies, such as dust-mite allergy, should:



- Avoid using second-hand mattresses
- Ensure they use a barrier between the mattress and themselves, such as a mattress protector and pillow covers
- Wash bedding regularly



Further information:

- Advice on allergen avoidance:
<https://www.nhs.uk/conditions/allergies/prevention/>
- Advice on improving indoor air quality:
<https://www.allergyuk.org/information-and-advice/conditions-and-symptoms/320-improving-your-indoor-air-quality>

Advice for high-risk patients



Pregnant women (and new mothers with babies <12 months)

Pregnant women and new mothers are at a higher risk of negative health impact from indoor air pollution and should be advised that this is the case, both for themselves and their babies.



In addition to the advice in this guide, pregnant women and new mothers should be advised to:

- Reduce their use of household sprays, air fresheners and other aerosols, and always follow product instructions
- If possible, avoid or reduce activities that produce particulate matter, such as using open solid-fuel fires or burning candles but if they do then always keep the room well ventilated
- Avoid any smoking in the household or near the baby as tobacco smoke is a particular risk



Referring for further help:

- If the mother's housing conditions are a concern, for example due to damp or a lack of ventilation, they can request a housing assessment from their local council's Environmental Health Officer Team
- If the mother is a smoker or lives with a smoker, you should refer them to the NICE Guidance on stopping smoking in pregnancy and after childbirth:

<https://www.nice.org.uk/guidance/ph26>

Further sources of information for healthcare professionals, public health practitioners, patients and the general public:

NICE Guideline [NG 149] on Indoor Air Quality at Home, Published January 2020:

<https://www.nice.org.uk/guidance/ng149>

WHO guidelines for indoor air quality:

<http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/policy/who-guidelines-for-indoor-air-quality>

Housing health and safety rating system (HHSRS) operating guidance: housing inspections and assessment of hazards:

<https://www.gov.uk/government/publications/hhsrs-operating-guidance-housing-act-2004-guidance-about-inspections-and-assessment-of-hazards-given-under-section-9>

My Health My Home campaign, advising patients on indoor air quality and ventilation:

www.myhealthmyhome.com

UK Guidelines for the levels of volatile organic compounds

in indoor spaces, published by Public Health England:

<https://www.gov.uk/government/publications/air-quality-uk-guidelines-for-volatile-organic-compounds-in-indoor-spaces>

Ventilation solution providers:

<http://www.beama.org.uk/ventilation-solution-providers.html>



Advice for patients living in damp conditions

Damp and condensation can be caused by either water intrusion or a lack of ventilation, which allows moisture to build-up inside the home without escaping.



If a patient reports issues of damp and condensation caused by **water ingress**, you should advise them to:

- Repair sources of water damage and reduce residual moisture with immediate effect



If a patient reports issues of damp and condensation caused by a **lack of ventilation**, you should advise them to:

- Check their home for ventilation, such as trickle vents or whole-house mechanical ventilation systems and ensure they are working. If there is no ventilation installed or they are not working effectively then make plans for inspection and installation at the earliest opportunity and, in the meantime, open windows where possible and safe to do so
- Always use mechanical ventilation systems such as extractor fans in wet rooms and cooking areas
- Avoid moisture-producing activities indoors, and where these cannot be avoided, to improve ventilation in the rooms where these activities take place



Further information:

- Guide to ventilation in your home:
<https://www.indoorairpollution.co.uk>
- How to get rid of damp and mould:
<https://www.nhs.uk/common-health-questions/lifestyle/how-do-i-get-rid-of-damp-and-mould/>

Patients living in the social or private rented sector

In most cases, people living in the social and private rented sectors will not be able to make improvements to their homes themselves and will require their landlord to undertake repairs and improvements for them.

In this case, private and social tenants should contact their landlord if:



The ventilation in their home is not adequate

The ventilation system is not working, trickle vents are blocked or damaged, or extractor fans in the kitchen or bathroom are not working



Repairs are needed

Including improvements to heating or removal of residual moisture from water damage



Tenants should also be advised that they may contact their local authority (council) if no action is taken to improve ventilation or carry out repairs. In the first instance, tenants should contact their local authority Environmental Health Officer and ask for a Housing Health and Safety Rating System (HHSRS) assessment.



Further information:

- Details of local councils can be found on the Government's Find A Council service: <https://www.gov.uk/find-local-council>
- **In addition, tenants can be directed to the following advice:**
Government advice on Private Renting: <https://www.gov.uk/private-renting>
- Government advice on Social/Council Housing: <https://www.gov.uk/council-housing>
- Government advice on tenant's rights under the Homes Act 2018: <https://www.gov.uk/government/publications/homes-fitness-for-human-habitation-act-2018/guide-for-tenants-homes-fitness-for-human-habitation-act-2018>
- Shelter advice on Health and Safety Standards for Rented Homes: https://england.shelter.org.uk/housing_advice/repairs/health_and_safety_standards_for_rented_homes_hhsrs

Rotherwick House 3 Thomas More St London E1W 1YZ
Registered in England Reg. No. 84313
Chief Executive Officer: Dr Howard Porter

© Copyright 2020 BEAMA Limited

This guide has been produced by the My Health My Home campaign, which is run by the trade association BEAMA. This campaign is committed to driving awareness and education of the risks to human health associated with poor indoor air quality and the actions that the public, healthcare professionals and policy makers can take in order to improve indoor air quality and health at home.

For further information on the **My Health My Home campaign**,
email indoorairpollution@beama.org.uk

References:

1. European Commission, Joint Research Centre – Institute for Health and Consumer Protection. (2003) Report No. 23. Ventilation, Good Indoor Air Quality and Rational Use of Energy.
2. BEAMA – My Health My Home. (2015). Indoor Air Quality Survey. YouGov. The survey was conducted from a representative sample of 2000 UK adults.
3. U.S. Environmental Protection Agency. (1987). The total exposure assessment methodology (TEAM) study: Summary
4. UK Chief Medical Officer. (2018) Annual Report of the Chief Medical Officer 2017: Health Impacts of All Pollution – what do we know?.
5. Yegambaram Manivannan, et al. (2015). Role of Environmental Contaminants in the Etiology of Alzheimer's Disease: A Review. *Curr Alzheimer Res*. Feb; 12(2): 116–146.
6. Office for National Statistics. (2020). Does exposure to air pollution increase the risk of dying from the coronavirus (COVID-19)? Available at: <https://www.ons.gov.uk/economy/environmentalaccounts/articles/doesexposuretoairpollutionincreasetheriskofdyingfromthecoronaviruscovid19/2020-08-13>. [Accessed 14 August 2020]
7. HEMAC Network. (2017). Influence of ventilation design on the prevalence of anti-microbial bacteria in homes. Available at: <https://hemacnetwork.com/amrproject/>. [Accessed 1 May 2018].
8. Bakó-Biró, Zs, et al. (2012). Ventilation rates in schools and pupils' performance. *Building and Environment* 48: 215-223.
9. National Institute for Health and Welfare. (2013) Efficient reduction of indoor exposures. Health benefits from optimizing ventilation, filtration and indoor source controls
10. Royal College of Physicians. (2016) Every breath we take: the lifelong impact of air pollution. Report of a working party.