

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Guideline scope

Indoor air quality at home

The Department of Health in England has asked NICE to develop guidance on indoor air pollution. NICE has worked with Public Health England to develop this scope.

The guideline will be developed using the methods and processes outlined in [developing NICE guidelines: the manual](#).

This guideline will also be used to develop the NICE quality standard for indoor air pollution.

1 Why the guideline is needed

Key facts and figures

People spend 60 to 90% of their lives indoors and 60% of that time at home.

Indoor air pollutants come from building materials, furnishing and cleaning products, and activities such as cooking and smoking. They also come from biological sources, for example, mould, house dust mites, bacteria, pests or pet dander.

Outdoor pollutants enter through windows or gaps and are a significant contributor to indoor air quality, particularly in deprived areas, see [The air quality strategy for England, Scotland, Wales and Northern Ireland](#) (volume 2) (Department for Environment, Food and Rural Affairs).

Exposure to indoor air pollutants including nitrogen dioxide, carbon monoxide, particulate matter, radon, biological agents and volatile organic compounds (VOCs) is widespread. It is associated with respiratory and other diseases and premature death.

1 Children and older people are most susceptible to health problems caused by
2 poor indoor air quality ([COMEAP: mortality effects of long-term exposure to](#)
3 [particulate air pollution in the UK](#) Public Health England).

4 **Current practice**

5 Currently no single government department is responsible for indoor air
6 quality. The regulation of air quality indoors and outdoors involves the
7 Department for Communities and Local Government, Department of the
8 Environment, Food and Rural Affairs, the Department of Health, Public Health
9 England, the Health and Safety Executive and the Department for Transport.

10 **Policy, legislation, regulation and commissioning**

11 This guideline will complement various directives, regulations and guidelines
12 from the World Health Organization and the European Union on indoor air
13 quality and the following UK guidance and regulations.

- 14 • In England there are [Smoke and CO alarm \(England\) regulations 2015](#).
- 15 • The Department for Communities and Local Government addresses indoor
16 air pollution through its [Housing Health and Safety Rating System](#).
- 17 • The [Housing Act 2004 \(part 1\)](#) covers hazards including indoor air quality.
- 18 • The [Public Health Outcomes Framework \(2016 to 2019\)](#) makes local
19 authorities responsible for improving air quality. Domain 3 (3.01) covers air
20 pollution. Domain 4 covers premature death from preventable causes,
21 including those linked to indoor air pollution. This includes death from
22 respiratory diseases, all cardiovascular diseases and cancer.
- 23 • [The air quality strategy for England, Scotland, Wales and Northern Ireland](#)
24 [\(volume 1\)](#) focuses mainly on outdoor air quality. But measures I and J
25 (advocating gas and oil for domestic combustion and listing product
26 standards for domestic boilers) are specific to domestic dwellings.
- 27 • The Department for Education's Building Bulletin BB101: [Guidance on](#)
28 [ventilation, thermal comfort and indoor air quality in schools](#) refers to the
29 World Health Organization indoor air quality guidelines.

1 **2 Who the guideline is for**

2 The public will be able to use the guideline to find out more about what NICE
3 recommends and help them make decisions.

4 This guideline is for:

- 5 • Local authority staff working in:
 - 6 – environmental health, housing and the wider public health sector
 - 7 – building planning or building control.
- 8 • Private and social landlords and housing associations.
- 9 • People working in the voluntary sector and non-governmental
10 organisations.
- 11 • Health and social care professionals who visit people in their homes or who
12 see people whose symptoms may be affected by air quality.
- 13 • Facilities managers in housing and residential settings.

14 It may also be relevant for:

- 15 • Local government elected members.
- 16 • The construction industry including developers, architects, surveyors and
17 planners.
- 18 • Product manufacturers, of both building materials and consumer products.

19 NICE guidelines cover health and care in England. Decisions on how they
20 apply in other UK countries are made by ministers in the [Welsh Government](#),
21 [Scottish Government](#), and [Northern Ireland Executive](#).

22 ***Equality considerations***

23 NICE will carry out an equality impact assessment during scoping. The
24 assessment will:

- 25 • list equality issues identified, and how they have been addressed
- 26 • explain why any groups are excluded from the scope.

27 The guideline will look at inequalities relating to the impact of indoor air
28 pollution on: children, older people, people with disabilities, pregnant women,

1 people with pre-existing medical conditions (for example, respiratory and
2 cardiovascular conditions), and those on a low income.

3 **3 What the guideline will cover**

4 **3.1 *Who is the focus?***

5 The whole population. But special consideration will be given to those at
6 increased risk of exposure to high levels of indoor air pollution or adverse
7 effects from indoor air pollutants. This includes:

- 8 • people living in deprived areas, as measured by the index of multiple
9 deprivation
- 10 • older people
- 11 • people with disabilities
- 12 • pregnant women and their unborn children
- 13 • children and young people
- 14 • people with conditions that are exacerbated by indoor air pollution, such as
15 stroke, heart disease and asthma.

16 **3.2 *Settings***

17 **Settings that will be covered**

- 18 • Indoor places where people live, including:
 - 19 – homes, for example houses, hostels and university accommodation
 - 20 – residential care, for example nursing homes, care homes and children's
21 homes.

22 **Settings that will not be covered**

- 23 • Living accommodation in prisons and secure environments.

24 **3.3 *Activities, services or aspects of care***

25 **Key areas that will be covered**

26 We will look at evidence in the areas below when developing the guideline,
27 but it may not be possible to make recommendations in all areas.

- 1 1 Interventions to change the structure of, ventilation of, and materials
2 used in, new and existing homes including:
- 3 – Installing extractor fans.
 - 4 – Reducing high humidity levels (using dehumidifiers) to prevent mould.
 - 5 – Air filtering systems to remove biological agents (for example, dander
6 and dust) and particulate matter.
 - 7 – Insulation to change the dew point (the temperature at which
8 condensation appears) and prevent mould growth.
 - 9 – Making the building more airtight (for example, by draught proofing or
10 installing double glazing).
 - 11 – Installing new heating systems (including mechanical ventilation with
12 heat recovery).
 - 13 – Removing indoor sources of pollution (for example, building materials
14 that contain asbestos).
 - 15 – Using construction materials and consumer products with low VOC
16 emissions.
 - 17 – Installing ventilation units and trickle vents in new buildings.
 - 18 – Retrofitting ventilation units in existing buildings.
 - 19 – Use of soft furnishings and other interior design factors, including
20 flame retardant treatments.
- 21 2 Interventions to change people’s knowledge, attitude and behaviour in
22 relation to indoor air pollution, including:
- 23 – How to best use ventilation, both mechanical and passive.
 - 24 – Using heating systems effectively.
 - 25 – Using building materials with low VOC emissions.
 - 26 – Household cleaning products, hygiene products (such as deodorants),
27 indoor pesticides and odourisation products (such as plug-in air
28 fresheners).
 - 29 – Cooking activities (for example, emissions from gas and electric
30 cookers) and combustion appliances (for example, electric fires).

- 1 – Environmental tobacco smoke¹.
- 2 – Vaping.

3 **Areas that will not be covered**

- 4 3 Preventing exposure to radon.
- 5 4 Preventing acute exposure to carbon monoxide from malfunctioning fuel
- 6 appliances.
- 7 5 Reducing outdoor air pollution.
- 8 6 Preventing infection.

9 **Related NICE guidance**

- 10 • [Cardiovascular disease prevention](#) (2010) NICE guideline PH25.
- 11 • [Air pollution – outdoor air quality and health](#). Expected to publish June
- 12 2017.
- 13 • [Asthma management](#). Expected to publish June 2017.
- 14 • [Chronic obstructive pulmonary disease in over 16s: diagnosis and](#)
- 15 [management](#). Expected to publish November 2018.
- 16 • [Housing: planning to improve health and wellbeing](#). Expected to publish
- 17 April 2008.

18 **3.4 Economic aspects**

19 We will take economic aspects into account when making recommendations.
20 We will develop an economic plan that states for each review question (or key
21 area in the scope) whether economic considerations are relevant and, if so,
22 whether this is an area that should be prioritised for economic modelling and
23 analysis. We will review the economic evidence and carry out economic
24 analyses using a public sector and any other perspective, as appropriate. It is
25 unlikely that health outcomes will be reported in the research literature, so
26 these will need to be modelled.

¹ No level of environmental tobacco smoke is considered safe ([Air quality guidelines for Europe](#) World Health Organization), therefore the evidence on this as an indoor air pollutant will not be reviewed. However, the committee will consider recommendations from other published NICE guidelines and adopt, adapt or cross refer to them as applicable. It will also report on any environmental tobacco smoke outcomes that are included, alongside other pollutants, during the reviews

1 **3.5 Key issues and questions**

2 While writing this scope, we have identified the following key issues, and key
3 questions related to them:

4 1 Exposure to pollutants:

5 1.1 What risk factors increase the likelihood of a person being exposed
6 to indoor air pollutants?

7 1.2 How is that risk stratified by different populations, different types of
8 dwelling and different pollutants?

9 2 Referral by healthcare professionals:

10 2.1 What signs and symptoms should prompt healthcare professionals to
11 consider indoor air pollution exposure in people presenting to health
12 services?

13 2.2 When is onward referral appropriate?

14 3 Material and structural interventions:

15 3.1 What are the most effective material and structural interventions for
16 preventing or reducing the health impacts of indoor air pollution? (For
17 example, the installation or retrofitting of ventilation units, or use of low
18 emitting materials.)

19 4 Interventions to enable occupants to change their behaviour:

20 4.1 What are the most effective strategies for raising awareness of the
21 risks of indoor air pollution in those at most risk?

22 4.2 What are the most effective interventions to reduce exposure to
23 indoor air pollution? (This could include: products used, or how to use
24 ventilation or filtration.)

25 4.3 What are the most effective interventions to change people's
26 behaviour to prevent or reduce their exposure to indoor air pollution?

27 4.4 How can people balance the need for energy efficiency and
28 ventilation to manage indoor air pollution exposure (for example,
29 balancing the cost of heating against opening the windows for
30 ventilation)?

31

32 All the questions above will:

- 1 • consider whether the impacts of interventions vary for different populations
- 2 and any adverse effects
- 3 • include a cost effectiveness dimension and be considered for cost
- 4 effectiveness modelling.

5 The key questions may be used to develop more detailed review questions,
6 which guide the systematic review of the literature.

7 **3.6 Main outcomes**

8 The main outcomes that will be considered when searching for and assessing
9 the evidence are:

- 10 1 Health-related outcomes from exposure to indoor air pollutants including:
 - 11 – Mortality.
 - 12 – Still birth, infant mortality and low birth weight.
 - 13 – Hospital admissions and attendance at primary care related to ear,
14 nose and throat problems, cardiovascular or respiratory disease.
 - 15 – Inflammatory response, respiratory or cardiac symptoms.
 - 16 – Rates of cardiovascular, respiratory disease, cancer and other
17 conditions (for example, neurological conditions) associated with
18 indoor air pollutants.
- 19 2 Levels and concentrations of indoor air pollutants within dwellings
20 including:
 - 21 – Particulate matter (PM 2.5 and 10).
 - 22 – Carbon monoxide.
 - 23 – Nitrogen dioxide.
 - 24 – VOCs and total volatile organic compounds (TVOCs), including
25 benzene, naphthalene, trichloroethylene and tetrachloroethylene.
 - 26 – Formaldehyde.
 - 27 – Polycyclic aromatic hydrocarbons, including benzo[a]pyrene.
 - 28 – Carbon dioxide (as a proxy measure for the effectiveness of
29 ventilation).
- 30 3 Individual changes in behaviour to reduce indoor air pollutants within
31 dwellings, including changes in people's:

- 1 – Intentions.
- 2 – Knowledge.
- 3 – Attitudes.
- 4 4 Economic outcomes:
 - 5 – Health-related quality of life.
 - 6 – Cost per quality-adjusted life year/disability-adjusted life year.
 - 7 – Cost–benefit ratio.
 - 8 – Net present value.
 - 9 – Cost per case avoided.

10 **4 NICE quality standards and NICE Pathways**

11 **4.1 NICE quality standards**

12 **NICE quality standards that may need to be revised or updated when** 13 **this guideline is published**

- 14 • [Preventing excess winter deaths and illness associated with cold homes](#)
15 (2016) NICE quality standard 117
- 16 • [Cardiovascular risk assessment and lipid modification](#) (2015) NICE quality
17 standard 100
- 18 • [Hypertension in adults](#) (2013) NICE quality standard 28
- 19 • [Asthma](#) (2013) NICE quality standard 25

20 **NICE quality standards that may use this guideline as an evidence** 21 **source when they are being developed**

- 22 • Indoor air pollution. Publication date to be confirmed

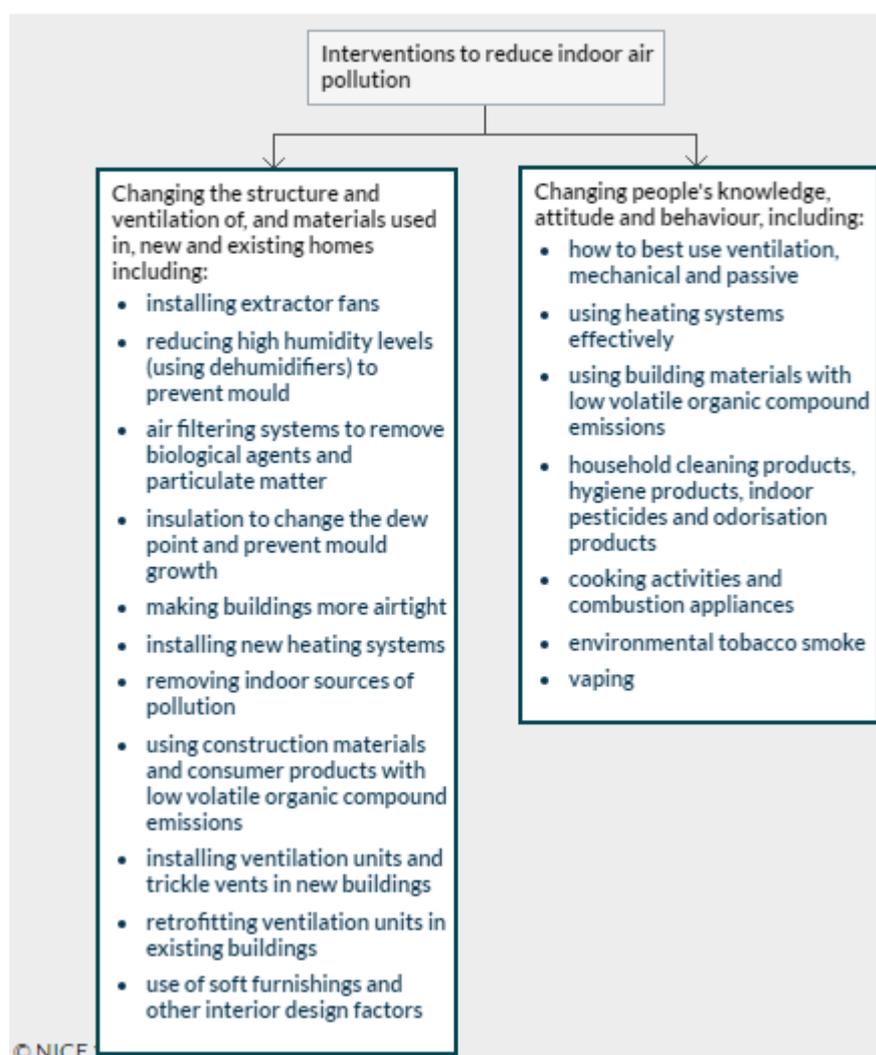
23 **4.2 NICE Pathways**

24 [NICE Pathways](#) bring together all related NICE guidance and associated
25 products on a topic in an interactive flowchart.

26 When this guideline is published, the recommendations will be incorporated
27 into a new pathway on indoor air pollution.

- 1 An outline of the new pathway, based on the scope, is included below. It will
- 2 be adapted and more detail added as the recommendations are written during
- 3 guideline development.

Indoor air pollution overview



4

5 Further information

This is the draft scope for consultation with registered stakeholders. The consultation dates are 10 February to 9 March 2017.

The final scope will take Public Health England priorities into account to ensure that associated areas of work carried out by the 2 organisations complement each other.

The guideline is expected to be published in February 2019.

You can follow progress of the [guideline](#).

Our website has information about how [NICE guidelines](#) are developed.

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