DAIKIN

Perfecting the Air

Understanding Indoor Air Quality

In Australian Homes

Find out more on www.daikin.com.au

CONTENTS

References

[1] The Daikin Australia 'Perfecting the Air' research questionnaire was fielded by Pure Profile in May 2022 to a nationally representative sample of more than 2,000 Australians aged 18+.

[2] Verified at Wakayama Medical University, Japan with the following test condition: Irradiated allergens with Streamer & checked decomposition of allergen proteins by either the ELISA method, electrophoresis or electron microscopy.

[3] Verified at Japan Food Research Laboratories using antibacterial test/mould elimination test (test number: 204041635-001).

[4] Verified by Swiss multi-national testing and certification company, SGS with the following test condition: Daikin Air Purifier model MC55YPVM operating in a 10m^3 chamber in Turbo mode.

FOREWORD

"Our data shows that COVID-19 has contributed to 40 per cent of Australian adults changing the way they think, and manage, air quality in their home to keep the family healthy."

There are few things in life more important to humans than having clean air to breathe.

While everyone knows that oxygen is essential for survival, the condition of the air we breathe can have a significant impact on our quality of life. When the air is free of pollutants we sleep better, eat better, work better and feel better.

The health implications of breathing in poor quality air are vast, and scientists are still trying to understand the full impact that it can have on people in both the short and long term.

Studies have shown links between air quality and conditions like asthma. Other indicators of poor air quality can include irritation of the skin, eyes, nose, and throat, as well as headaches, drowsiness and affected mood. Ongoing exposure to some pollutants has even been linked to poisoning, cancer, and chronic health conditions.

Air quality in the home is on the mind of the nation

Daikin Australia recently commissioned the 'Understanding indoor air quality in Australian homes' research[1] to better understand how Australians feel about the air in their home and its impact on their wellbeing.

Undertaken by Pure Profile in May 2022, the research which surveyed more than 2,000 adults, shows that the air quality in our homes is often top of mind because of its impact on the family's health and wellbeing.

Australians think about the quality of the air they breathe at home either all the time (6 per cent), often (19 per cent) or sometimes (59 per cent). Just 16 per cent are unconcerned about their home air quality.

For many, the events and challenges of the last four years including the Black Summer Bushfires, COVID-19 and the recent record rains and floods of 2022 has had a significant impact on their physical health and mental wellbeing.

For example, our data shows that COVID-19 has contributed to 40 per cent of Australian adults changing the way they think, and manage, air quality in their home to keep the family healthy.

Of those surveyed, 52 per cent also reported that they, or a family member had suffered ill-health effects from poor quality air in the home, including respiratory problems, asthma, allergy symptoms, poor sleep, headaches and more.

Winter dials up the cold, costs and health risks in the home

As we head into the cooler months, the risk of poor-quality air in our homes increases. Mould growth, dust mites, pets indoors more, poor air circulation and even the type of heating used in the home all contribute to higher levels of pollution and allergens indoors.

For many Australians, managing the winter season becomes a careful balancing act to keep the family warm and healthy, without breaking the bank.

Almost half (48 per cent) of the Australians surveyed in the Daikin commissioned study stated that they were concerned about managing the cost of heating their home this winter. Choosing a cost-efficient home heating system was named as the number one priority for respondents.

Choosing a home heating solution that also improves air quality was rated as the least important feature for Australians.

Using technology to take control of your wellbeing and wallet

Daikin has been heating and cooling homes in Australia for over 50 years. We're used to dealing with the extremes of the harsh Australian climate and understand how temperature, pollutants and allergens in the air can affect our health and wellbeing.

While many Australians know that good air quality in the home is important, our research has found that some of the simplest choices and behaviours to improve indoor air at home go overlooked.

In this report, we explore the findings from the 'Understanding indoor air quality in Australian homes' research, including the concerns and habits of Australians when it comes to home heating and managing air quality in their home. The National Asthma Council Australia also identifies potential air hazards in the home, and the steps you can take to make your home healthier over winter.

We will also look at the technology that is making Australian homes healthier and more efficient to run, so you, and your family can breathe easier this winter.

Dan Tosh
General Manager, Daikin Australia

BALANCING THE AIR: QUALITY VERSUS COST

Warm, healthy, and good for the hip pocket – the everyday challenge worrying Australians this winter

For just under a third (32 per cent) of Australians, staying warm this winter is simple – you just turn on the heater when you're cold.

For more than half (52 per cent) though, the heater won't go on until the family has layered up in more clothes and there is a consensus that it is ***really*** cold.

Half (48 per cent) of Australians are concerned and 21 per cent are somewhat concerned about managing the cost of heating their home this winter – and they should be.

Reports in April 2022 from the Australian Energy Market Operator show that wholesale energy costs jumped a massive 141 per cent in the three months to March 31, compared with the same period last year.

For Aussie households, this price spike is expected to translate to power bill increases of up to 20 per cent as energy companies pass on growing costs.

Most of our research respondents agree that the family would be cold and uncomfortable if they had to turn the heating off this winter due to costs, but there are more serious implications too.

Nearly four in ten (38 per cent) worry that their family could get sick from the cold and one in four hold concerns that mould and bacteria could become a problem in the home.

Australians know air quality is important, but many households sacrifice it to keep bills under control

For one in five (22 per cent) Australians, air quality at home is always a top priority. For others, recent events have changed the way they think about and manage the air in their home. These include the Black Summer Fires (15 per cent), COVID-19 (40 per cent) and the recent extreme rains and floods caused by this year's La Niña event (8 per cent).

Working from home has also prompted 16 per cent of Australians to pay more attention to the air in their homes and how it may be impacting their wellbeing.

Half (48 per cent) of Australians are concerned and 21 per cent are somewhat concerned about managing the cost of heating their home this winter – and they should be.

However, concerns about the quality of the air in our homes takes a back seat when it comes to heating, in favour of limiting energy costs.

When asked to rank what is most important when it comes to home heating, 'cost efficient' is the number one pick for Australians. This is followed by the speed in which it heats the space, how the type of heating could impact the environment and lastly, whether or not it improves the home's air quality.

What is the most important thing for your family when it comes to home heating?

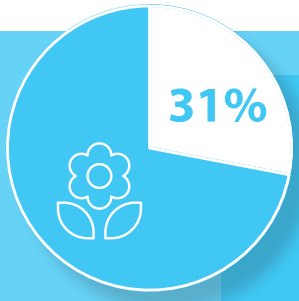
Item	Overall rank	Rank distribution	Score	Number of rankings
Cost efficient to run	1		6,722	2,001
Heats the house quickly	2		5,612	2,001
Is a better choice for the environment	3		3,876	2,001
Improves air quality	4		3,793	2,001

Lowest to highest rank

FAST FACTS:

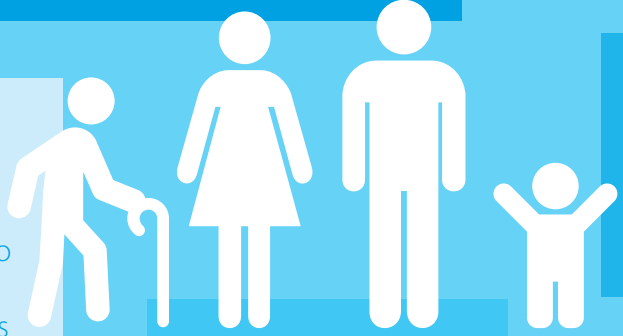
WHAT AUSTRALIANS REALLY THINK ABOUT HEATING AND AIR QUALITY OVER WINTER

48% of Australians are concerned about managing the cost of heating their home this winter



31% of Australians have experienced allergy symptoms from poor air quality at home

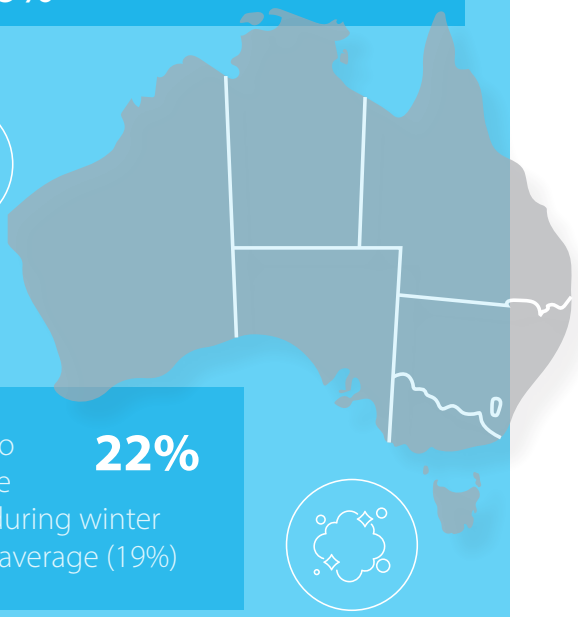
Women are more concerned than men about managing the cost of heating their home this winter **52%** **45%**



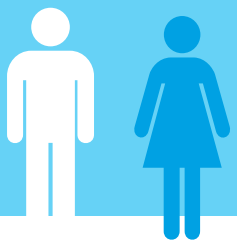
Australians aged over 65 are more likely to be worried about viruses in the home

23% Men are more likely than women) to be concerned about air quality in the home

Families with children under the age of five are more likely to be concerned about their family getting sick this winter as a result of heating concerns **56%**



Victorians are more likely to use an air purifier to ensure good air quality at home during winter compared to the national average (19%) **22%**



54% Women are slightly more likely than men to say 'put on a jumper' before turning the heating on

Tasmanians are more likely to use the additional settings, such as dry and fan, on their air conditioner **21%**

UNDERSTANDING THE RISKS TO INDOOR AIR QUALITY IN THE HOME

Professor Sheryl van Nunen

Unless you have an air purifier measuring 'Fine Particulate Matter' in your home, it can be difficult to know if the air quality in your home is good or not.

Most people though are pretty good at sensing when the air around them is of poor quality. For instance, that "hot and stuffy" feeling you get when in a closed room can often be less about the actual temperature, and more about your biological response to worsening air quality, specifically carbon dioxide levels, around you.

Our bodies do a great job of telling us when the air quality is poor, but the tell-tale signs of sneezing, coughing or watery eyes can often go ignored as we power through our busy lives.

When asked if they, or another family member had suffered any health effects due to poor air quality, more than half (52 per cent) agreed they had.

Professor Sheryl van Nunen, specialises in the understanding and treatment of allergies and is a spokesperson for the National Asthma Council Australia to help educate Australians about the impact of allergens on our health and wellbeing.

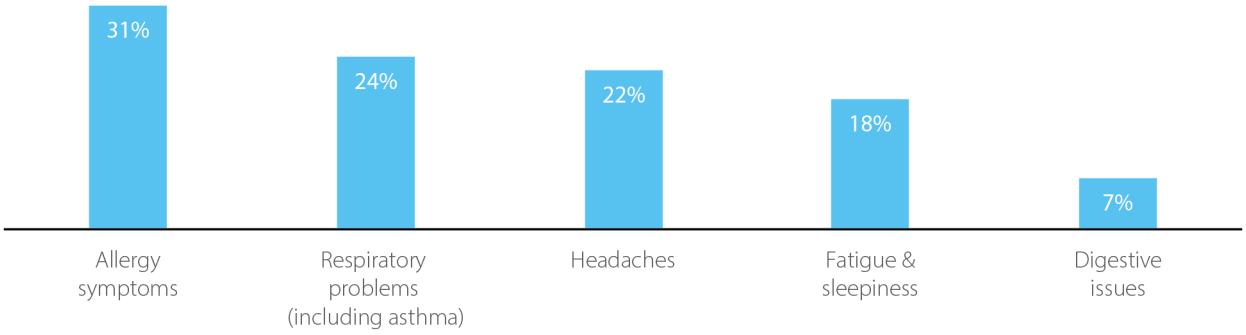
"Over 70 per cent of people I see with allergic rhinitis have a dust mite allergy. While the symptoms can seem mild, the cumulative effect of wheezing and nasal blockage results in poor sleep which can increase the likelihood of catching any respiratory virus, which, in turn, worsen any rhinitis or asthma. It also reduces the ability to perform tasks safely, including driving."

Australians rank the indoor air pollutants and allergens they worry about the most.

Item	Overall rank	Rank distribution	Score	Number of rankings
Mould	1		14,382	2,001
Bacteria	2		12,486	2,001
Viruses	3		12,196	2,001
Dust mites	4		11,220	2,001
Odours	5		10,176	2,001
Pollen	6		8,609	2,001
Cleaning chemicals	7		8,267	2,001
Pollutants (e.g. Formaldehyde)	8		7,576	2,001
Per hair/ dander	9		5,115	2,001

Lowest to highest rank

Have you, or another member of your family suffered any health effects due to poor air quality?



For Professor van Nunen, Daikin's research indicates that many Australians are simply unaware of some of the biggest risks in their homes when it comes to air quality, or how to improve the air they are breathing.

"We're currently in the middle of one of the wettest years on record, thanks to the effects of La Niña. Mould has certainly become a significant issue for many homes and workplaces, but the more serious concern for families is how the increase in rain and humidity has boosted the prevalence of dust mites," says Professor Dr van Nunen.

In Daikin's research, Australians named dust mites as only their fourth concern when it comes to air pollutants and allergens in the home. The small spider-like animals live in dust in the home and flourish in humid conditions.

Dust mites can cause hay fever symptoms such as nasal blockage, sneezing or a runny nose and are also a trigger of asthma.

"Over 70 per cent of people I see with allergic rhinitis [hay fever] are allergic to house dust mites. While the symptoms can seem mild, the cumulative effect of wheezing and nasal blockage results in poor sleep which can increase the likelihood of catching any respiratory virus, which, in turn, worsens any rhinitis or asthma. It also reduces the ability to perform tasks safely, including driving. It's more serious than people think," says Professor van Nunen.

An open window can cause more harm than good

One of the main concerns for Professor van Nunen was the approach taken by Australians to ensure they have good air quality at home during winter. One of the most common actions among research respondents (59 per cent) was to open a window, a practice that was encouraged during the height of the pandemic.

"Good ventilation in the home means cross ventilation. The air must be able to enter and leave your house, for example through the front and back doors, to have any meaningful impact.

"Opening just one window may introduce more allergens and irritants, such as pollen and mould spores, smoke, and pollutants to the air you breathe," says Professor van Nunen.

Professor van Nunen notes there are other risks too, as cold air or inconsistent temperatures can trigger asthma and allergy symptoms.

Professor van Nunen, says the key to better air quality in the home for winter is to manage humidity and ensure any ventilation is helping to improve the quality of the air you breathe, not hindering it.

"Humidity encourages mould growth and allows pests like dust mites to thrive. Choose heating systems that regulate

the temperature and reduce the amount of moisture in the air to make your home healthier this winter.

If you can't create true cross flow of air in your home, this is where an air purifier can make a big difference to the air quality in your home and your overall health," says Professor van Nunen.

Professor van Nunen notes this is particularly important for city and apartment dwellers who may struggle to achieve proper cross ventilation in their home.

Look for the Blue Butterfly

The National Asthma Council Australia created the Sensitive Choice program to help people identify products and services that are asthma and allergy aware, through the trusted blue butterfly.

Products and services that carry the Sensitive Choice blue butterfly have been reviewed and approved by an independent expert panel that determines their potential benefit to people with asthma and allergies.

All Daikin products with Streamer Technology, including air purifiers, Alira X and Zena carry the Sensitive Choice blue butterfly.

To stay warm and healthy this winter Professor van Nunen says…

1. Be **mindful of moisture and humidity** in the home as it can encourage mould and dust mites
2. Listen to your body and act. Sneezing, runny nose, nasal blockage and wheezing are all **signs of allergies** that can impact your respiratory health over time
3. If you can't achieve **good cross flow ventilation**, use an air purifier instead
4. Vacuum and dust your home once a week to **remove dust mites, pollens and other allergens**, such as pet hair, and help prevent them from impacting your health
5. Look for air conditioners and air purifiers that carry the **National Asthma Council Australia's Sensitive Choice Blue Butterfly**

SENSITIVE CHOICE

DID YOU KNOW?

Gas is not only more expensive, it could also be affecting your family's health and wellbeing.

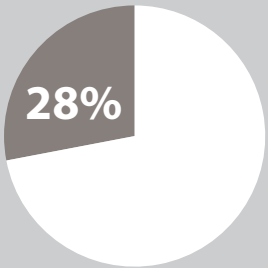
According to the National Asthma Council Australia, exposure to gas appliances including heaters, may be associated with new asthma cases or asthma symptoms.

A recent report by the Climate Council of Australia 2021, 'Kicking the gas habit: How gas is harming our health', also states that gas use is a major source of indoor air pollution and a significant contributor to health issues among Australians, in particular young children.

The report notes that using gas at home can create a comparable risk of childhood asthma as from household smoking.

Unflued gas heaters also produce water vapor through the combustion process, adding to the humidity in your home.

Daikin's research shows that 28 per cent of those surveyed rely on gas heating in winter to keep the family warm.



HOW TECHNOLOGY IS CHANGING
THE AIR IN OUR HOMES

Daikin's research shows that over half (55 per cent) of Australians are already heating their homes with the most cost-efficient choice available, reverse-cycle air conditioning.

"In lab testing, Daikin's Streamer Technology was found to destroy 99.9 per cent of mould and allergens in 24 hours[2], and 99.6 per cent of pollen in just two hours[3]."

But Australians could be doing much more with their ducted and split systems to reduce their power bills, and make the air in their homes healthier to breathe.

Using the latest technology to improve air quality at home

When it comes to air quality in your home, all air conditioners are not created equal. Different systems in your home will have a huge impact based on the level of air purification offered.

Most will include a particulate filter which takes dust and fibres out of the air. More advanced equipment will include additional physical purification, like Daikin's Enzyme Blue Filter, alongside chemical filtering of the air to improve its quality.

For people who are after systems with a high level of purification, look for the National Asthma Council Australia's Sensitive Choice badge. When found on air conditioners and air purifiers, this badge represents third party verification to ensure they are suitable for people who are particularly sensitive to poor air quality.

Daikin's Streamer Technology is an active air purification system that improves indoor air quality. It works by using charged air particles to destroy pollutants like pollen, mould and other allergens such as dust mites from the air. Ionised air also improves the capability and lifespan of the physical filters.

In lab testing, Daikin's Streamer Technology was found to destroy 99.9 per cent of mould and allergens in 24 hours[2], and 99.6 per cent of pollen in just two hours[3]. All Daikin systems with Streamer Technology carry the National Asthma Council Australia's Sensitive Choice Blue Butterfly symbol including air purifiers, Alira X and Zena.

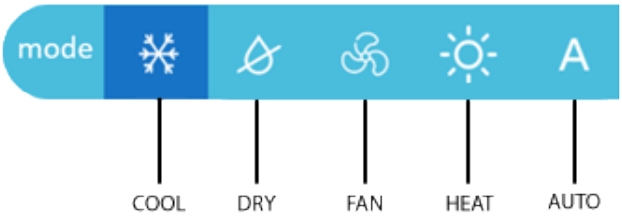
Furthermore, all Daikin Air Purifiers have been proven to remove 99.99 per cent of Human Coronavirus (HCoV-229E) and Influenza A (H1N1) in a 10m^3 area within 30 minutes[4].

How to reduce home heating costs and improve air quality this winter

Have you ever wondered what all the buttons and dials on your air conditioning unit do? If so, you're not alone. Most Australians (49 per cent) just hit the cooling and heating buttons and leave the rest alone.

According to our research, just one in ten Australians use their heating system daily to maintain a consistent temperature in the home and only 14 per cent use the dry and fan settings.

Knowing how to use your system to maximise your comfort, without driving up your power bill is key.



Follow these five tips to get the most out of your air conditioning system this winter.

1. If the **humidity is over 70 per cent**, use the **dry or mould setting** to remove moisture from the air and stop mould from forming and to kill dust mites and other allergens

2. Running your system in **short bursts** of time to reduce costs **can cost more**. Choose warm on your system and set the temperature at 21-22 degrees in winter to **stay comfortable and keep your bills lower**

3. **Turn your system on** in the afternoon **before the temperature drops too much**, a colder start requires more energy and equals larger energy bills

4. **Ensure your home is well insulated** to keep the warmth in. Use curtains, window and door seals to **stop drafts from cooling your home down**

5. Choose a **reverse-cycle system** that offers built in air purification to **remove moulds, pollens, bacteria and viruses from the air**

STREAMER