The impact of climate change and air pollution on those living with lung disease or lung cancer – a community survey 2023

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Contents

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Executive Summary

Climate change is causing weather changes, as well as worsening air quality in Australia and globally. Air pollution and climate change pose a significant threat to the lung health of Australians, and those living with a lung disease or lung cancer are particularly vulnerable to the quality of the air they breathe. Air pollution is the fourth leading risk factor for death globally, making it a significant public health issue.

The impacts of climate change are beginning to be felt and this emphasises the link between our environment and health and importantly the need to reduce our environmental impacts to protect public health more broadly. We know there is no safe level of air pollution to breathe, and only clean air is safe for our health. However, across Australia residents are breathing polluted air resulting in significant negative health outcomes.

Lung Foundation Australia developed a short survey to understand the impacts of climate change and air pollution for those living with a lung disease and lung cancer. Specifically, we sought to understand the impacts of air pollution on those living with a lung disease, how people manage the risks from air pollution whilst living with a lung disease, and what resources and actions people living with a lung disease want. Respondents were recruited through Lung Foundation Australia's mailing list for people living with a lung disease or lung cancer. There were 20 questions in total, including a mix of quantitative and qualitative questions. The survey was conducted between August and September 2023. Data was analysed descriptively.

The survey received 448 responses with representation from each state and territory in Australia. Respondents were predominantly older adults (74% were 65 years and over). Air pollution had a substantial impact on those living with a lung disease, including needing additional medical treatment (59% of respondents required medicated treatments, 30% required a GP appointment, 11% attended the emergency department, 9% of respondents were admitted to hospital, and 6% needed urgent care from an ambulance) and impacting their quality of life (impacted 66% of respondents' ability to exercise, 60% of respondents' emotional wellbeing, 56% of respondents social activities, and 28% of respondents work or school).

Only 14% of respondents felt extremely confident in protecting their lung health and managing symptoms when air pollution is high. Respondents felt the air pollutants causing the greatest impact on their lung health was from smoke from planned and unplanned bushfires and road traffic vehicle emissions, as well as heatwaves. Correspondingly, these were the topics respondents most wanted guidance and resources on. People would most trust information from Lung Foundation Australia or a health professional. Most (84%) respondents thought it was extremely important for government to develop a strategy to reduce the level of air pollution. When asked what we could do to better help those with lung disease, respondents wanted us to increase awareness of air pollution and health impacts in the wider community, and influence government to reduce air pollution and protect lung health.

Australians living with a lung disease are greatly impacted by climate change and air pollution. There is strong support from the lung disease community for a government led strategy to reduce the level of air pollution and protect lung health as well as additional guidance from health professionals and non-government organisations such as Lung Foundation Australia.

Introduction

Climate change is the long-term shift in the average weather pattern globally and can lead to noticeable change in average surface temperature[1]. An increase in global temperature of as little as 1.5°C is not considered safe[2], however, a 2023 report predicted that the global surface temperature will exceed 1.5°C above preindustrial levels for at least one year between 2023 and 2027[3].

Climate change is leading to more frequent and severe heatwaves, wildfires, storms, and floods[2,4], which in turn leads to increases in harmful smoke and mould in the air and impacts the quality of air Australians are breathing. Climate change is one of the main contributors of air pollution, with greenhouse gases from the combustion of fossil fuels, and higher temperatures causing an increase in the presence of allergens and harmful air pollutants[5]. Air pollution is the contamination of the outdoor environment by a chemical, physical, or biological agent which modifies natural air quality of the atmosphere[6]. Air pollution consists of many different chemicals and gases which can cause adverse effects on human health, making it a significant public health issue. In 2019, air pollution was the fourth leading risk factor for death globally[7].

There is no safe level of air pollution and exposure to even low levels of air pollution poses a threat to human health and increases the risk of illness and death from major diseases such as lung cancer, chronic obstructive pulmonary disease, and lower-respiratory infections (such as pneumonia)[8]. Population groups, such as those living with pre-existing lung conditions, pregnant women, elderly, and children are more susceptible to the impacts of air pollution[9]. In Australia it is estimated that 2600 people die from air pollution each year, with the presence of air pollutants such as particulate matter 2.5 one of the main pollutants leading to premature mortality[10]. The estimated financial cost of premature deaths due to air pollution ranges from roughly $11 billion to $24 billion per year[11].

On the 3rd of December 2023, the Department of Health and Aged Care released Australia's first National Health and Climate Strategy. The Strategy outlines priority actions to reduce the impacts of climate change on population health and address the contribution of the health system to climate change[12]. Although the Strategy sets out a strong plan for action and signifies the Government's commitment to the health of Australians and the environment, the scope of the strategy is limited. The Strategy focuses on the health systems' role in climate change, which although important, does not delve into the broader system level changes to make meaningful change in mitigating the health impacts from climate change.

We need to do more to support the one in three Australians living with a lung disease and protect the lung health of the community more broadly. Whilst Australia has relatively clean air, no level of air pollution is safe. Across Australia residents are breathing polluted air resulting in significant negative health outcomes, with particular recognition of the impacts of air quality occurring during seasonal burns and events[13,14,15,16,17].

Considering ongoing air pollution and poor air quality in Australia, Lung Foundation Australia developed a short survey to understand the impacts of air pollution and climate change for those living with a lung disease. The survey aimed to: understand the impacts of air pollution and climate change on those living with a lung disease, how people manage the risks from air pollution and climate change whilst living with a lung disease, and what resources and actions people living with a lung disease want.

Methods

Study design and recruitment

Data was collected via a self-completed web-based survey conducted between 20th August – 3rd September 2023. Respondents were recruited through Lung Foundation Australia's mailing list for people living with a lung disease or lung cancer. An Electronic Direct Mail (EDM) was sent to 7,149 accounts, inviting recipients to share their experiences about challenges they have faced, support that has helped and any broader concerns about air pollution issues. A link to the survey was also posted on Lung Foundation Australia's Twitter and LinkedIn accounts. Anyone living with a lung disease or lung cancer was eligible to take part in the survey. There was no eligibility screening. Respondents were informed that responses would be anonymous.

The survey was hosted on Microsoft Forms, an online survey platform within Office 365. The survey was in English.

Survey measures

There were 20 questions in total: 16 multiple choice questions, two open ended questions, and two questions to gather demographic data (age range and state of residency). See Appendix A for the full survey. Questions were designed to understand the most important sources of air pollution for people living with lung disease, the impact air pollution has on their lives, current ways of managing air pollution, and identifying what further support is needed to help prevent and manage symptoms from air pollution.

Analysis

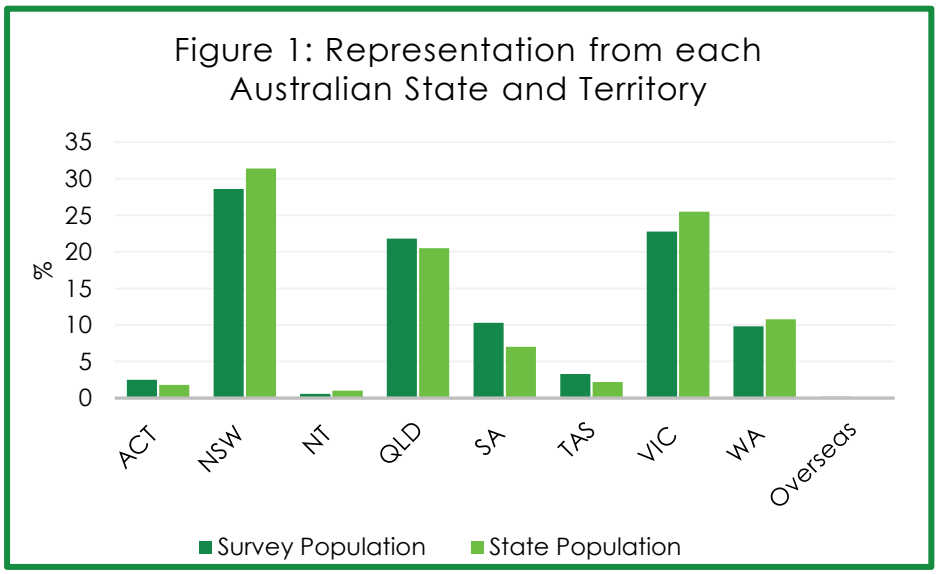
Quantitative data has been analysed descriptively. Question 18 was an open-ended qualitative question. Responses to the qualitative question were grouped into three themes: the impact of air pollution, managing the risks from air pollution, and actions needed. Illustrative quotes that represent the themes are used throughout the report.

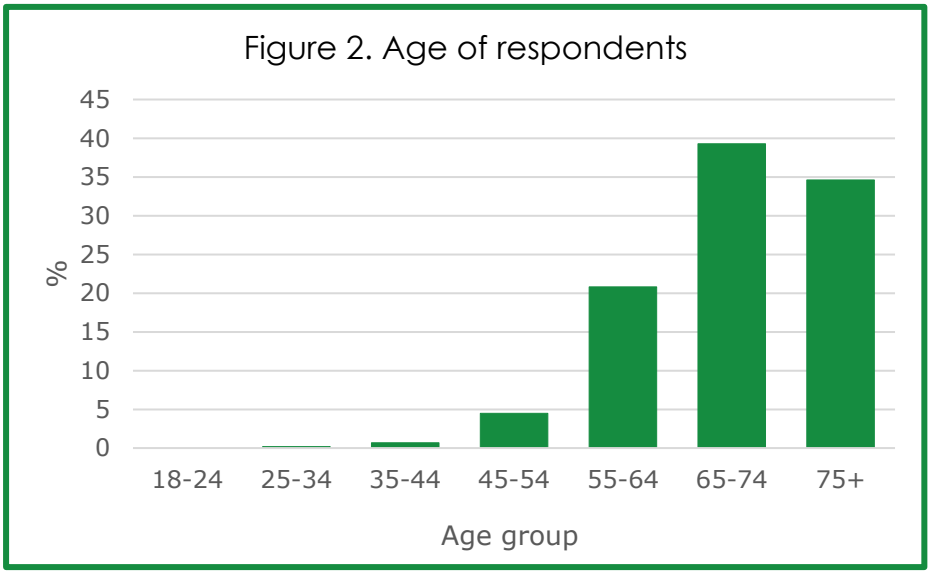
Based on the main themes from the quantitative and qualitative responses, results are reported in three sections: understanding the impacts of air pollution on those living with a lung disease, understanding how people manage the risks air pollution whilst living with a lung disease, and understanding what resources and action people living with a lung disease want.

Results

Survey respondents

The survey received 448 responses from across Australia, with even representation from each state and territory (refer to Figure 1). Lung disease is most prevalent in older Australians, and this was reflected in the survey with 74% of the survey respondents being 65 years and over (refer to Figure 2). The average time to complete the survey was 12 minutes 10 seconds.

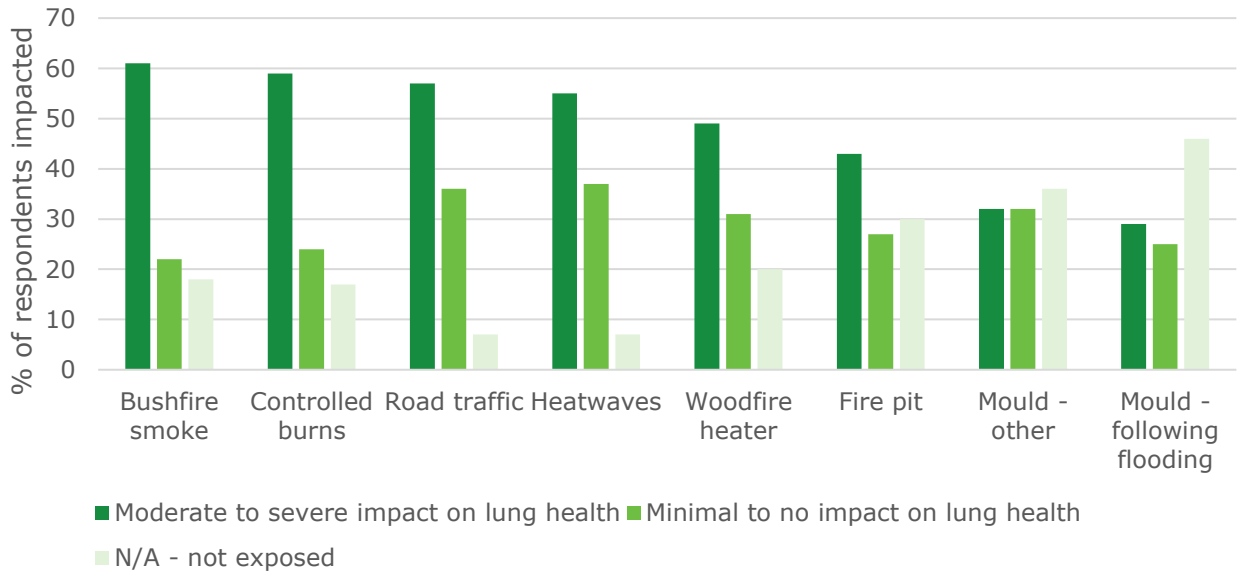




Understanding the impacts of air pollution on those living with a lung disease

The top four sources of air pollution severely or moderately impacting the lung health of those with a lung disease include bushfire smoke (61% of respondents were severely or moderately impacted), smoke from controlled burns (59% of respondents), road traffic vehicle emissions (57% of respondents) and heatwaves (55% of respondents) (see Figure 3).

Figure 3. Source of air pollution and severity of impact on lung health



As a result of air pollution, the majority of the respondents (82%) required additional medical and/or non-medical action. As a result of air pollution, 59% of respondents required medicated treatments such as blue reliever and oral antihistamine, 30% required an appointment with a GP, 11% presented to the emergency department, 9% of respondents were admitted to hospital, and 6% needed urgent care from an ambulance.

"I have to close all windows and doors, put rolled up towels under all door entrances to stop smoke/pollution some days. I lock myself indoors and use my Ventolin puffer more than normal."

"On fire/smoke pollution days I shut myself in the house, use air conditioner and air purifier. in extreme situations I will confine myself to one room and run my air purifier at maximum. Also increase Ventolin/Salbutamol, Symbicort and Spiriva, as well as increasing my breathing technique to clear lungs."

"At present during humid days, storm days, bushfire days, I stay inside and try to cocoon my home and turn on the air conditioner. I also ensure I have oxygen and my concentrator is at hand."

In addition to extra actions and/or medical treatment required, air pollution impacted other aspects of respondents' life. Air pollution greatly or moderately impacted 66% of respondents' ability to exercise, 65% of respondents overall life, 60% of respondents emotional wellbeing, 56% of respondents social activities, and 28% of respondents work or school.

"I rarely leave my home anymore for fear of poor air quality days etc., which cause me to have anxiety fear and stress which I never really had beforehand. I feel my quality of life has greatly reduced. I no longer participate in outdoor events and gatherings or exercise due to fear of an attack and not being able to get my breath and suffocating. I am a different person to who I was I feel I have lost myself. People without lung diseases don't seem to understand."

"I experienced a fair amount of bushfire smoke from both controlled burns and bushfires. With COPD I like to keep windows open and air circulating but on bushfire or burn days this is impossible and affects me both physically and mentally reducing the hours I can spend outside

or with fresh air circulating, this also affects my mental health and makes me isolated as I cannot participate in outings with friends or general daily chores i.e. shopping/bill paying."

"Not participating in outdoor exercise has a negative impact. Increased anxiety about poor air quality that is largely out of my control."

"Prescribed Burns leave smoke hanging in the air for days, it makes it more difficult to do everyday tasks, life seems so much harder."

Understanding how people manage the risks from air pollution whilst living with a lung disease

Only 14% of respondents felt extremely confident in protecting their lung health and managing symptoms when air pollution is high. Forty-six percent of respondents felt somewhat confident and 40% felt neutral to not confident at all.

Respondents employed different at-home strategies to reduce their exposure to air pollution. When asked what at-home strategies they have used, 84% of respondents close windows/doors, 75% avoid certain activities or locations, 53% use an air conditioner to recirculate indoor air at home and 33% use an air purifier at home. From the qualitative data, multiple people also mentioned physically removing themselves from the area with air pollution and going to stay with friends or family.

"Bushfires and burning off are scary events for me. I try to stay indoors, close windows and recirculate air in car when driving."

"Enduring smoke from bushfires and burning-off ('controlled burning/fuel reduction burning) is a major concern. My chest can tighten, not unlike imagining it wrapped in barbed wire, and I have to retreat indoors to the well-closed AV room with air purifier on and take inhaler."

"During previous local Forest fires I had to physically relocate to a friends home well away from the affected area."

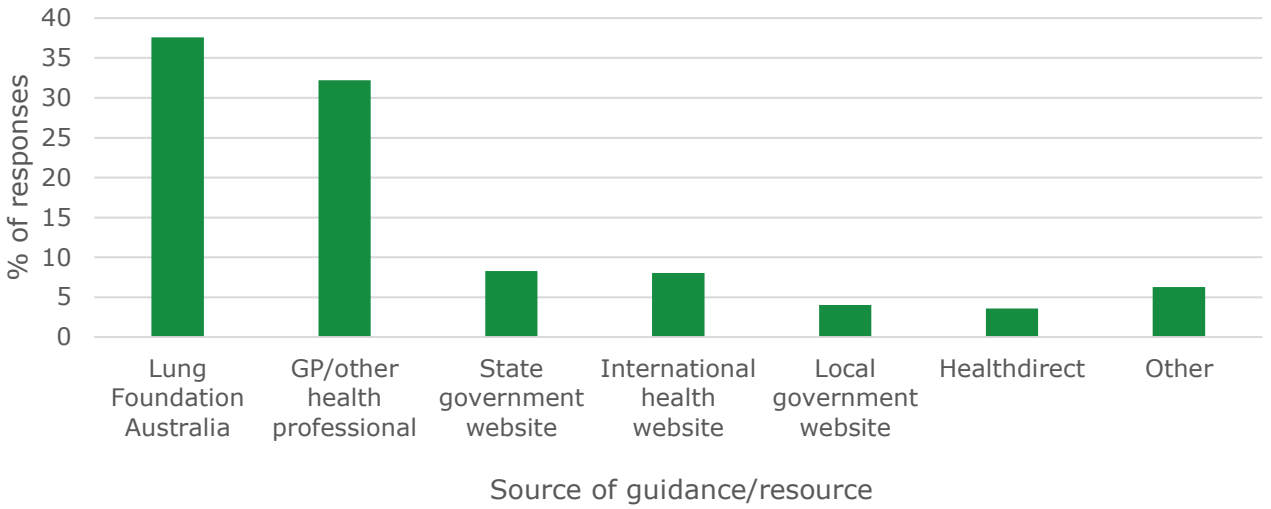
"We have blackout's because of overuse of power in a heatwave no consideration for being on oxygen I was told to go to a shopping centre."

Fifty-nine percent of respondents spoke with a health professional about air pollution and managing their lung condition. Of those that had spoken to a health professional, 66% of respondents felt they had received clear advice, whilst 34% were still unsure; and only one in two have a written action plan completed with their doctor, to know what actions to take when self-managing an exacerbation or worsening symptoms if impacted during poor air quality days. Forty-one percent of respondents had not spoken to a health professional about air pollution and managing their lung condition. Of those that had not spoken with a health professional, half wanted to.

"I currently do not have an action plan for exacerbation as the respiratory specialist disagrees with the plan given by my GP but has not replaced it with anything."

Just under half (49%) of respondents had found helpful guidance or resources on air pollution and living with a lung disease. A further 17% had looked but were unable to find useful resources. The most common sources of helpful guidance were Lung Foundation Australia and their GP or health professional (See Figure 4).

Figure 4. Source of guidance or resource on air pollution and living with a lung disease accessed by respondents



When asked more about the types of resources that were helpful, most respondents did not identify a specific source of information and rather mentioned where they go for information/who provided the information and general themes of the information. There was no consensus on information sources or topics available for support/guidance.

Understanding what resources and action people living with a lung disease want

Fifty-four percent of respondents said they would like further resources and guidance on air pollution and living with a lung disease. The most common topics recipients wanted guidance and resources on were heatwaves, bushfire smoke, smoke from controlled burns, and road traffic vehicle emissions. These four most requested topics correspond with the top four sources of air pollution perceived to impact their lung health (see Figure 3 above).

The most frequent type of guidance requested by respondents was on how to protect lung health during days of high air pollution, followed by information on what symptoms to look out for/monitor/when to seek medical advice, and how to prepare for poor air pollution days. Seventy-seven percent of respondents also want more information for other climate related triggers including heatwaves, pollen, dust and other weather-related events. For information from on air pollution and lung health, respondents would most trust this information from Lung Foundation Australia (71% of respondents), health professional/s (48% of respondents), and a Government website (25% of respondents).

When asked what actions they would like from Lung Foundation Australia, 76% said they wanted Lung Foundation Australia to increase awareness of air pollution and health impacts in the wider community, 68% of respondents said influencing government to reduce air pollution and protect lung health, 67% said develop resources on air pollution and managing a lung disease, 60% said share information on real-time air pollution levels for each state and territory, 23% said webinars, and 7% said other. The need for localised and frequent updates on air quality was a theme that also emerged in the qualitative data.

"Recent controlled burns would have been easier to deal with (e.g. stay inside on those days), if information regarding dates had been readily available locally."

"[I] understand that burn off's are required but … local advise from council and local bush fire brigades are limited."

When asked about government action, most (84%) respondents thought it was extremely important for government to develop a strategy with clear actions to reduce the level of air pollution and protect lung health. Less than one percent of respondents thought it was not important for government to develop a strategy.

"My life is severely impacted by my lung diseases and it would greatly improve my life if a clean air policy was introduced."

"They are putting profits above the health of our citizens and our elected officials both state and federal are doing nothing to control them."

Conclusions

We know there is no safe level of air pollution to breathe, and only clean air is safe for our health. However, across Australia residents are breathing polluted air and are exposed to heatwaves resulting in significant negative health outcomes. Those living with a lung disease are particularly vulnerable to the impacts of air pollution and climate change, and it is clear this is taking a significant toll on their health with increased medical care required and significant impacts to overall wellbeing for many. People living with a lung disease need tailored support and guidance to manage their lung condition during days of high air pollution and during climate events like heatwaves.

There is strong support from the lung disease community for a government led strategy to reduce the level of air pollution and protect lung health, and for non-government organisations such as Lung Foundation Australia to increase public awareness of the health impacts of air pollution and influence government to reduce air pollution. Lung Foundation Australia remain committed to advocating for cleaner air to protect the lung health of all Australians as well as providing information and support. We appreciate those who shared their personal experiences with Lung Foundation Australia. This information will be used to guide our future work in this space and help advocate for change.

Appendix

Appendix A: survey

Let us know how air pollution is impacting you.

Lung Foundation Australia wants to understand how air pollution is affecting those living with a lung disease. If you are living with a lung disease we invite you to share your experiences about challenges you have faced, support that has helped and any broader concerns you have about air pollution issues. Please complete the short anonymous survey below.

Your responses will remain anonymous. For more information on Lung Foundation Australia's privacy policy visit: https://lungfoundation.com.au/about/privacy-policy/

1. Please indicate the impact of these sources on your lung health over the last few years:

	Severely impacts	Moderately impacts	Minor impacts	Does not impact me	NA - I am not exposed
Bushfire smoke	○	○	○	○	○
Smoke from controlled burns	○	○	○	○	○
Woodfire heater smoke	○	○	○	○	○
Fire pit/ braziers smoke	○	○	○	○	○
Mould (following a flooding event)	○	○	○	○	○
Mould (outside of a flooding event)	○	○	○	○	○
Heatwaves	○	○	○	○	○
Road traffic vehicle emissions	○	○	○	○	○

2. As a result of air pollution, which of the following actions or extra medical treatments have you required? (Please select all that apply)

- ☐ Non-medicated strategies at home (closing windows, reducing time outside)
- ☐ Medicated treatments at home (blue reliever, oral antihistamine)
- ☐ Appointment with GP
- ☐ Urgent care from an ambulance
- ☐ Presentation to emergency department
- ☐ Admission to hospital
- ☐ I have not required any additional treatment/management strategies
- ☐ Other _____

3. Which of the following strategies have you implemented at home to reduce exposure to air pollution? (Please select all that apply)

- ☐ Air purifier
- ☐ Closing of windows/doors
- ☐ The use of an air condition to recirculate indoor air
- ☐ Avoiding certain activities or locations
- ☐ I have not needed any management strategies at home
- ☐ Other _____

4. To what extent has air pollution impacted the following aspects of your life?

	Greatly impacts	Moderate impacts	Neutral	Minor impacts	No impact
Work, school/ university	○	○	○	○	○
Social activities	○	○	○	○	○
Exercise	○	○	○	○	○
Your emotional wellbeing	○	○	○	○	○
Your overall life	○	○	○	○	○

5. When air pollution is high, how confident do you feel protecting your lung health and managing your symptoms?

- ☐ Extremely confident
- ☐ Somewhat confident
- ☐ Neutral
- ☐ Not very confident
- ☐ Not at all confident

6. Have you spoken with a health professional about air pollution and managing your lung condition?

- ☐ Yes, I spoke with a health professional and received clear advice
- ☐ Yes, I spoke with a health professional but I am still unsure
- ☐ No, I have not spoken with a health professional but would like to
- ☐ No, I don't want to speak with a health professional

7. Do you have a written action plan that you have completed with your doctor, to know what actions to take when self managing an exacerbation or worsening symptoms if impacted during poor air quality days?

- ☐ Yes
- ☐ No

8. Have you found helpful guidance and resources on air pollution and living with a lung disease?

- ☐ Yes
- ☐ No, I looked but I didn't find anything helpful
- ☐ No, I haven't looked for guidance or resources but would like to

9. Where did you find helpful guidance and resources? (Please select all that apply)

- ☐ My GP or other health professional
- ☐ Lung Foundation Australia
- ☐ Healthdirect
- ☐ Local government website
- ☐ State government website (e.g. NSW Health, QLD Health, VIC Health)
- ☐ International health website
- ☐ Other _____

10. What type of guidance and resources were helpful? Please include the topic and where the information/guidance was found (include links to websites if relevant).
For example, factsheets on mould from local council or health advice from a local GP on managing symptoms.

11. Would you like further resources and guidance on air pollution and living with a lung disease?

- ☐ Yes
- ☐ No

12. What topics would you like guidance and resources on? Living with a lung condition and... (please select all that apply)

- ☐ Bushfire smoke
- ☐ Smoke from controlled burns
- ☐ Woodfire heaters
- ☐ Firepits/ braziers
- ☐ Mould following a flood
- ☐ Mould outside of a flooding event
- ☐ Heatwaves
- ☐ Road traffic vehicle emissions
- ☐ Other _____

13. What type/s of guidance would you like? (Please select all that apply)

- ☐ How to talk to a GP about my lung condition and air pollution
- ☐ How can I prepare for poor air pollution days
- ☐ How to protect my lung health during days of high air pollution
- ☐ What symptoms should I look out for / monitor / when to seek medical advice
- ☐ How to talk to my neighbours when smoke from their property is impacting me
- ☐ Other _____

14. Who would you trust to receive information from on air pollution and lung health? (Please select all that apply)

- ☐ Health professional/s such as a GP
- ☐ Healthdirect
- ☐ Lung Foundation Australia
- ☐ Government website
- ☐ Other _____

15. Lung Foundation Australia wants to help support your lung health. What actions would you like us to take? (please select all that apply)

- ☐ Influencing government to reduce air pollution and protect lung health
- ☐ Increasing awareness of air pollution and health impacts in the wider community
- ☐ Developing resources on air pollution and managing a lung disease
- ☐ Webinars
- ☐ Sharing information on real-time air pollution levels for each state and territory
- ☐ Other _____

16. How important is it for the government to develop a strategy with clear actions to reduce the level of air pollution and protect lung health?

- ☐ Extremely important
- ☐ Somewhat important
- ☐ Neutral
- ☐ Somewhat not important
- ☐ Extremely not important

17. There are other climate related triggers for people living with a lung condition, including heatwaves, pollen, dust and other weather-related events. Would more information and action in these areas be helpful to you?

- ☐ Yes
- ☐ No
- ☐ Unsure

18. We want to know more about your experiences during natural disaster events and poor air quality days. Please tell us, in a couple of sentences, about any challenges you have faced, support that has helped and any broader concerns you have about air pollution issues.

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19. Where are you located?

- ☐ Australian Capital Territory
- ☐ New South Wales
- ☐ Northern Territory
- ☐ Queensland
- ☐ South Australia
- ☐ Tasmania
- ☐ Victoria
- ☐ Western Australia
- ☐ Overseas

20. How old are you?

- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65-74
- ☐ 75 years and over

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