

TRANSCRIPT

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into the Health Impacts of Air Pollution in Victoria

Melbourne—Wednesday, 11 August 2021

MEMBERS

Ms Sonja Terpstra—Chair

Mr Clifford Hayes—Deputy Chair

Dr Matthew Bach

Ms Melina Bath

Dr Catherine Cumming

Mr Stuart Grimley

Mr Andy Meddick

Mr Cesar Melhem

Dr Samantha Ratnam

Ms Nina Taylor

PARTICIPATING MEMBERS

Ms Georgie Crozier

Mr David Davis

Dr Tien Kieu

Mrs Beverley McArthur

Mr Tim Quilty

WITNESSES (*via videoconference*)

Professor Sotiris Vardoulakis,

Dr Rob Phair, President,

Mr Cos Camassa, and

Mr Tim Forcey, Rural Doctors Association of Victoria.

The CHAIR: I declare open the Legislative Council Environment and Planning Committee's public hearing for the Inquiry into the Health Impacts of Air Pollution in Victoria. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we have gathered on today, and I pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the broadcast of these proceedings. I would also like to welcome any members of the public who are watching these proceedings via the live broadcast.

So at this point I will take the opportunity to introduce committee members to you. My name is Sonja Terpstra. I am the Chair of the Environment and Planning Committee. Also appearing with me via Zoom today is Mr Clifford Hayes, who is the Deputy Chair, Mr Cesar Melhem, Dr Samantha Ratnam, Ms Melina Bath, Dr Matthew Bach and Mrs Bev McArthur.

Now, all evidence that is taken today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during the hearing is protected by law. You are protected against any action for what you say during this hearing, but if you go elsewhere and repeat the same thing, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded, and you will be provided with a proof version of the transcript following the hearing. Transcripts will ultimately be made public and posted on the committee's website.

So what I will ask each of you to do now in turn is please state your name and organisation you are appearing before for the Hansard record. So perhaps we will start with you, Dr Phair—your name and the organisation you are appearing for.

Dr PHAIR: Good morning. My name is Dr Rob Phair. I am President of the Rural Doctors Association. That is who I am appearing on behalf of.

The CHAIR: Thank you. Professor Vardoulakis.

Prof. VARDOULAKIS: Good morning. I am Professor Sotiris Vardoulakis. I am Professor of Global Environmental Health at the Australian National University and the National Centre for Epidemiology and Population Health, and I am here in support of the Rural Doctors Association of Victoria.

The CHAIR: Great. Thank you. Mr Camassa.

Mr CAMASSA: Cos Camassa. Yes, I am appearing for the Rural Doctors Association.

The CHAIR: Great. Thank you. And Mr Forcey.

Mr FORCEY: Tim Forcey, home comfort and energy adviser and energy researcher.

The CHAIR: And you are appearing for?

Mr FORCEY: I have been asked to participate here by the doctors.

The CHAIR: Great. Thank you very much. Well, with that I will hand over to you to make your opening remarks. So if I could ask you to please limit it to about 10 minutes. I will give you a 1-minute warning as we approach the time, and then that will allow plenty of opportunity for committee members to ask questions of you. So I will hand over to you.

Dr PHAIR: Thank you, Ms Terpstra. Can I first ask Professor Vardoulakis to kick off with his presentation.

Prof. VARDOULAKIS: Thank you very much. Thank you for inviting us to present at this hearing. I will share my screen.

Visual presentation.

Prof. VARDOULAKIS: So I hope you can see my first slide. I will give a broad overview about air pollution and health effects and also discuss in some more detail the effects of wood heaters on air quality and health in Victoria and more broadly.

The main points I would like to make are summarised here. So first of all I would like to stress that air pollution has a significant impact on mortality in Australia every year. This is equivalent to around 2600 deaths nationally, with 650 of these deaths in Victoria. Air pollution aggravates lung disease and heart disease—so that includes asthma, COPD, angina and other conditions—and can be more harmful for old people, young children and pregnant women.

Wood heaters and road transport are two of the main air pollution sources in populated areas in Victoria and nationally, and incentives to phase out wood heaters and promote electric vehicles, active transport—by this we mean walking and cycling—and clean energy will improve outdoor and indoor air quality and human health. These incentives can also reduce greenhouse gas emissions and help mitigate climate change.

So now I will elaborate on these points in the next 10 minutes or so. This map gives you a global overview of the impact of air pollution on mortality and morbidity—disability-adjusted life years—in different countries. This image is from the global burden of disease study, and it shows that the most affected areas are in Asia actually—South Asia, East Asia—and in sub-Saharan Africa, but everybody is affected to some extent by air pollution. We know that about 90 per cent of the global population lives in areas where air pollution is above the World Health Organization standards, and overall the impact of air pollution on mortality is equivalent to 8 million deaths every year. So this is a very substantial impact on mortality, and there are also effects on disease and illness and wellbeing. We see here that Australia is not one of the most affected countries, but air pollution is still causing a significant impact on mortality in Australia. This is around 2 per cent of all-cause mortality. This is obviously important. These are of concern.

We can see here the figures at national levels. So, as I mentioned, the estimate of the impact of air pollution mortality is 2616 deaths every year and the equivalent figure for Victoria is 650. That is every year attributable to anthropogenic air pollution, anthropogenic PM_{2.5}. So this is fine particles which can penetrate deep into the respiratory system and also translocate into the bloodstream and cause inflammation and many knock-on effects on vital organs. So the effects of air pollution can be severe, especially for people who have pre-existing illness and those who are more vulnerable to air pollution, like young children, pregnant women and the elderly.

As I mentioned, wood heaters are one important source of air pollution in Australia. It affects many areas, urban and rural areas. You can see here the density of wood heaters in Victoria. As you can see here, there is a high density of wood heaters. There are many wood heaters in and around Melbourne but also in rural areas. So it is a very widespread problem, and it is similar in other parts of Australia, especially in places where you have cold winters, like here in Canberra, for example, and also in New South Wales and other parts of the country.

So to highlight this study from colleagues in Sydney, in New South Wales, what you can see here is the effect of wood heaters on air pollution in Greater Sydney. What I have highlighted on this table is that this is equivalent to around 24 per cent of PM_{2.5} concentrations in Greater Sydney. It is the most substantial source. It is the biggest source of air pollution in Greater Sydney. As you can see on the map here on the right-hand side, it affects densely populated areas, so it is a large problem. And of course there are other sources which are important, like road traffic and power generation, which are also listed on this table.

I will show you a few slides from Canberra. As I said, we have cold winters here. We have air pollution in winter, mainly coming from wood heaters but also we were very heavily affected by the bushfires from the Black Summer and on other occasions. What you can see here on this graph is annual PM2.5 levels over a number of years, over 10 years, and you can see that we had very high concentrations of PM2.5 in 2019 and 2020. That was mainly due to the bushfires, the bushfires we experienced with the Black Summer and the smoke that affected Canberra. You can see here that this part of the graph, which shows again PM2.5 early in 2020, it reflects the smoke from the bushfires with very high daily concentrations of PM2.5 reaching up to 800 micrograms per cubic metre. That is an extreme concentration of PM2.5, and high levels persisted for a number of weeks in the start of 2020.

What you can see here on this graph also is the effect of wood heaters. You can see that we have relatively high concentrations of PM2.5 in winter, in June and July, and this is because of the use of wood heaters and also because of the atmospheric conditions. So during wintertime we have stagnation of polluted air over the city and poor dispersion conditions. That means that air pollution stays for longer and affects people, those who live in houses with wood heaters and also those who live in the neighbourhoods. And of course we know that people who are in more vulnerable situations, economic situations, have less capacity to adapt, less capacity to avoid air pollution and they are more affected.

Now, in this graph I have blown up the part which shows the PM2.5 in winter of 2020 in Canberra. You can see here the concentrations in some cases exceeding the national standard of PM2.5. This is due to the wood heaters, as I explained. Also it is important to highlight that in 2020 those kind of air pollution episodes were increased in wintertime because of people working more from home during the COVID restrictions and of course using more wood heaters to warm up their houses. So this is also an issue of concern. As people start working increasingly from home they will be using more domestic heating, and if this is based on wood heaters, that will increase neighbourhood air pollution and also indoor air pollution.

There are effective solutions to reduce air pollution indoors and outdoors and reduce its impact on human health. This is mainly by switching to clean forms of energy and also to cleaner domestic heating solutions. One key solution is reverse-cycle air conditioning. This is cost effective. It does not emit pollution at the point of consumption, and if the electricity is sourced from solar panels or other renewable energy sources, then it will not emit any pollution at the point of generation of energy.

Other important interventions are related to road transport and the electrification of the vehicle fleet. This would reduce pollution from road traffic. Improving infrastructure for cycling and walking will reduce air pollution and road traffic congestion, and increase physical activity levels, which is very beneficial for cardiovascular health. And of course all these interventions will also reduce greenhouse gas emissions, helping mitigate climate change, which, as we know, as we have seen in the recent report published by the IPCC, is a great threat to human health.

We have a very recent publication from the Centre for Air Pollution, Energy and Health Research, CAR. Colleagues at CAR published this week a position paper on reducing the health impacts of wood heaters in Australia. They have a number of key recommendations here, which I will read out.

The first recommendation is that state regulations with strong compliance and enforcement mechanisms and sufficient reserves to support local governments to address local wood heater smoke would improve the situation. Second recommendation is: Improved measurement and monitoring of air quality across Australia is needed to protect the health of all Australians. We know that there is substantial monitoring of air quality in big cities but much less in rural areas, and this is an issue. We need to know what the air quality is to be able to address the problem.

CAR also recommends the introduction of schemes to incentivise the replacement of wood heaters in existing homes and discourage the inclusion of wood heaters in new homes in populated areas. This is very important—to reduce the prevalence of wood heaters and replace them with cleaner forms of energy in domestic heating.

CAR also recommends also the introduction of rigorous emissions standards for real-world heater operation. This is important because some of the existing standards are based on ideal situations, like testing the wood heaters in a laboratory rather than in real-world conditions.

The next CAR recommendation is that national leadership is needed on driving wood heater emission reductions by revitalising the central wood heater register. It is important to know where we have these wood heaters, how old they are and what their condition is, to maintain a wood heater register at a national level. The final CAR recommendation is to introduce well-funded, comprehensively implemented, and evaluated public health promotion programs. These should promote clean energy solutions and health literacy in relation to air quality.

That was actually my last slide. So I have listed here the references I have used in my presentation, which I am very happy to share with the committee. I would like to thank you for your attention and thank you for the invitation. I am very happy to answer any questions.

The CHAIR: Great. Thank you so much for that. I will hand over to the committee for questions now. Ms Bath, a question from you.

Ms BATH: Thank you, Chair. Thank you for appearing before us today. I will direct my question to Dr Phair—the first one. In an email to me on 31 July you inferred that I was under the influence of payments from the Australian Home Heating Association, signing your name, president of the Rural Doctors Association of Victoria. Dr Phair, did you have the authority on behalf of that organisation to make such unfounded and scurrilous assertions?

Dr PHAIR: Chair, if you do not mind, I would prefer to continue with my presentation. I could answer this question, but I think Ms Bath is referring to private correspondence, which is not really relevant directly to the hearing right now.

Ms BATH: Chair, Dr Phair in his communication to me wrote specifically about my contribution in our hearing with respect to that organisation and I ask him to publicly withdraw unfounded and scurrilous allegations.

Dr PHAIR: Chair, would you like to direct me on how I should proceed?

The CHAIR: Well, I have not seen the correspondence that Ms Bath is talking about. From what I understand from Ms Bath she said it was a matter that was raised in regard to these proceedings. But again, I have not seen it. It is a matter for you as to whether you wish to answer that question or not, and that is fine. It is for you to decide whether you want to answer or not, but if you do not want to answer, that is fine. We can move onto the next question.

Dr PHAIR: I would prefer for people to ask Professor Vardoulakis about the content of his presentation, because the focus here should be on air pollution and specifically on the content of Professor Vardoulakis's presentation. That would be my preference. I have not had a chance to make any presentation yet, and I would prefer to make my presentation first, and questions can be posed to me after that—I would be very happy. And I am very happy to address what Ms Bath is referring to, but it should fit into my presentation in context.

The CHAIR: Okay. Thank you.

Mrs McARTHUR: Chair, if I might say, we did not know that any of these other witnesses were going to present today. We only have Dr Phair as a witness. He has offered his presentation to another witness, and we have listened to that witness in good faith—

The CHAIR: No, Mrs McArthur, the four people who are appearing are appearing under the rubric of the rural doctors association, so that is quite okay. But I note your concern. I do not want to take up the time that we have got allocated to get the most out of these witnesses today. Ms Bath, I note you had another question in regard to the presentation, so I will ask you to ask your next line of questioning.

Dr RATNAM: Sorry, just a quick point of order, Chair, if I may. It sounds like there are more presentations to be had from the association, so could we see all the presentations and open up for general questions? That might be a better process.

The CHAIR: There is probably some confusion, because, again, we were only anticipating one person would be coming today. But does anyone else have any presentations that they need to run through?

Mr MELHEM: Chair, just if I may quickly. I do not want to sit here and listen to four or five different presentations. We have heard one, and I think we should quickly jump to questions and answers, because we have only got about 30 minutes to go. Unless the other presenters would like to go for a couple of minutes each—otherwise we will not have time. No disrespect to anyone, and I do apologise for my comments, but unfortunately we are restrained by time.

The CHAIR: I understand. Are there any other presentations? Dr Phair have you got a visual presentation to run?

Dr PHAIR: No, I do not, Chair. I have a verbal presentation. So just to clarify: I am seeking to advocate for rural communities, and to do my job in the best way I can of course I want to collect best possible evidence—

The CHAIR: Sure.

Dr PHAIR: and, of course, I think it is a privilege for the committee to have a professor of global environmental health to present. I think it is a high-value presentation. I would like to express my gratitude to Professor Vardoulakis for appearing. So I would appreciate if we focus on the content.

The CHAIR: Yes, I understand. So you are next, Dr Phair. Can I just get an indication then, because, as I said, we are flying a little bit blind this morning because we were not prepared for four people. Mr Camassa, do you have anything to present as well—or Mr Forcey—or is it just you, Dr Phair?

Dr PHAIR: Can I just quickly if you do not mind, Chair, summarise. I am going to present a brief presentation as a rural GP—

The CHAIR: Yes.

Dr PHAIR: Mr Camassa is going to make a brief presentation from a health consumer perspective, expressing some of the frustrations he has felt in his efforts to have his issues on air pollution dealt with, and then in conclusion, we aim to have a very brief presentation by Tim Forcey, who I hope has been let back in.

The CHAIR: He is there.

Dr PHAIR: Excellent. And so, really, Mr Forcey is going to briefly present on clean energy alternatives to, for example, domestic wood heaters.

The CHAIR: Okay. But just so you understand, we have only got half an hour left, and that will really eat into our time to be able to ask you questions.

Dr PHAIR: I will make my presentation as brief as possible. Thank you, Chair.

The CHAIR: Okay. All right. Over to you, Dr Phair.

Dr PHAIR: Thank you very much for the opportunity to present today. I work as a rural GP in Central and East Gippsland, and my work includes anaesthetics and emergency medicine. I am also currently President of Rural Doctors Association of Victoria, and in this role I do my best to represent the interests of rural doctors and their communities. Air pollution has been a longstanding personal interest of mine. Clean air is key to human health, and we know that there is no safe level of air pollution. You have had multiple presentations to this effect so far.

We know that rural and remote populations have much worse health outcomes than metropolitan populations, so for me this is about health equity. In my job I see rural populations presenting with heart attacks and strokes. I see children with acute asthma, exacerbations of CRPD and also worsening dementia—we have a large retiree population where I work. We know that air pollution, in particular high levels of PM2.5, contributes to all of these conditions. In addition to all of this, we have a health system at present which is under significant stress. A lot of our hospitals are full; it is very hard to provide our rural populations with the highest standard of care. We know the main sources of air pollution in rural Victoria include domestic wood heaters; bushfires, exacerbated by climate change as a significant driver; planned burns; and coal-fired power stations.

Communication of environmental health issues is a major challenge in rural communities. We know that many people still love their wood heaters, and it is certainly an issue that I have to acknowledge. When we turn on the TV to watch footy or the Olympics in Gippsland, every advertisement, pretty much, that comes on seems to be about wood heaters. Fact sheets hidden on an EPA website do not cut through to describe the problem, and they do not seem to be making any impact. So communication and public health messaging is a major problem.

With respect to these heaters and what Ms Bath was referring to, my concern is that the Australian Home Heating Association was given an opportunity to present at the last hearing. Now, from my perspective this is an industry lobby group which has a business model based on wood heaters and exclusively on wood heaters, which we know are highly polluting. We know from the evidence, and my evidence is evidence based, that a lot of the efforts to reduce pollution from wood heaters have not actually worked—so they are ineffective. We have to move beyond that, and that is why I am glad that Tim Forcey is able to give a brief overview of other options. Clearly our rural communities need a multipronged approach: we need well-insulated housing stock and we need access to clean, affordable energy in addition to, I guess, information and good communication.

So what do we know about wood heaters specifically? I would like to commend to you the CARCRE position paper, which I forwarded to Michael Baker this morning. I am sorry if this is late, but this paper was only released on Monday. This paper makes it clear that we have a range of approaches that we can bring, which Professor Vardoulakis has just described. We know that wood heaters are dangerous products. We know that the emissions from wood heaters are much greater in the real world than they are in a laboratory setting. We know that standards have not worked. We know that education has not worked. And also we know that replacing old wood heaters with new wood heaters is not an effective intervention, because these new heaters still emit significant pollution.

Now, very few Victorians only have access to wood heaters. I think it is a misconception that anyone in any built-up area in Victoria would not have access to electricity or other options. So I would like to just point that out. As things stand, Victorians are not protected from wood heaters. Current regulations involving local government, state government and EPA are not effective. Cos Camassa will be bringing this up in his presentation.

This inquiry's terms of reference state that it is seeking statewide practical and cost-effective mitigation strategies. Now, we know that there are more than 200 000 wood heaters in Victoria, and we know from the Australian Home Heating Association that 80 per cent of their business is going into rural communities. So this is a rural environmental health problem. This is something that is affecting my community; it is affecting rural communities all around Victoria. If we look at data from the EPA, we know from recent years—2016 the data was from—only 5 per cent of households in Melbourne were using domestic wood heaters, yet that was causing an estimated 32 per cent of PM_{2.5} pollution in the Port Phillip airshed. So 5 per cent of households causing 32 per cent—the single greatest contribution of the most significant fine particulate air pollution. So we know it is a problem and we are not doing anything about it.

I would like to suggest to the committee that the low-hanging fruit, as has been suggested by previous submissions, is to reduce our dependence on wood heaters and find a way of not installing new wood heaters and of phasing out old wood heaters. There are a range of approaches that need to go along with that. For example, we need to ensure that rural communities in particular have access to information about affordable alternatives, we need to offer communities support to better insulate their homes and we need to work particularly on communication, on the communication aspect, because it is a challenge; there is no doubt. We need best practice air quality standards which are enforceable, and on top of that we need to address other sources of air pollution that are a concern to the community.

Professor Vardoulakis described that the major air pollution events associated with bushfires are causing extreme short-term levels of PM_{2.5}. Also, planned burns are a major concern in certain communities, such as in the Yarra Ranges, where there has been an attempt to start a pilot project into wood-smoke pollution. However, native forests continue to be logged. The logging coupes are then burnt, causing significant air pollution events. Yet it seems that government agencies do not want to accept responsibility for significant air pollution events. The local communities are saying, 'Please stop logging native forests; these pollution events are affecting our health', and yet the lines of accountability are unclear.

So in summary I would like to suggest that domestic wood heaters for rural communities are a significant and preventable cause of morbidity and mortality. We have strategies that we can employ to avert these problems, and I would like to call on the committee to investigate these strategies further and ensure that we have enforceable standards which will actually provide relief to rural communities. Thanks for your time, and I would like to move on to our further presenters. I am open to questions.

The CHAIR: Thank you. So who do you want to briefly address us next, Dr Phair?

Dr PHAIR: I am very happy if Cos Camassa continues and provides a community perspective on wood heaters and air pollution.

The CHAIR: I will just remind you that we are going to run short of time, so we would really appreciate this kind of wrapping up soon so we can ask you questions.

Dr PHAIR: Yes. Please.

Mr CAMASSA: Thank you, Rob. I will be quick, seeing that we are limited for time. Thank you for the opportunity to present today and to share my experiences and frustrations with wood smoke in the community and how it has affected me and my family. I have lived in Melbourne metropolitan for a very, very long time in the current area where I live in the northern suburbs. I have been here for over 45 years. The problem we have experienced with the neighbours is that within an area of about 2000 square metres there would be about maybe three or four local residents that burn continually throughout the period from about April to about late September. So this has impacted our family. It has restricted us in what we are able to do. We are not able to sit outside and have a drink or a coffee as a family. We feel our lives are being restricted by, I guess, the actions of others in terms of wood smoke burning.

We have been in contact with the EPA and our local environmental council person. We have had very little support, I guess, from the EPA. We have asked for air quality monitoring in the area, which they have told me that they are not able to do, and I continually get referred to our local environmental council member. He has been a great support over the last 10 or 15 years. We have done a lot of work. We have identified and contacted those residents that are continually burning. He has been out there to inspect the timber that they burn. He says it is all aboveboard, although some of the timbers they do burn have some very horrible smells. We are not talking about burning red gum; it is all sorts of materials. I have seen some of the neighbours having materials delivered that they burn, and some of these materials are old wooden ship pallets and old fence palings, which I understand are treated with chemicals and are carcinogenic. I have seen old timber from old homes, which have the old lead in the paint.

So the environmental person from council has gone out there and tried to educate them. He has provided them materials. He has talked to them about cleaning and maintaining their wood heaters. He has even gone so far as doing a mail-out for me. I provided him information on the residents that I know that were burning, and we have pleaded with them to be a little bit more, I guess, understanding of other residents. They constantly burn. We have asked them if they could please restrict the times that they burn. We cannot hang up our clothing. All our clothing smells when we put the washing out. So this has been an ongoing battle for a long, long time, and with all that information that we have provided we have seen really no change in the behaviour and their burning patterns.

So our family has had to put up with this for, as I said, about 15 years. Some of us have certain medical conditions, and that makes it hard on us. We cannot even open a window in the morning to get some fresh air. As soon as you open that window all you get is wood smoke coming through. So it has had quite an impact on our lives, and it has been a long battle with really no change for the outcomes that we were seeking. And I know that our environmental person at council shares our frustrations, and he has said on many occasions that their hands are tied. They have very limited powers in what they can do and how they can manage the situation for us, so in all I just think that, as a family, we look at it and we say, 'Where's the equality?'. Residents can burn continually, while other residents that have, I guess, an understanding of the effects and how it is affecting the environment and people's health—I see an imbalance there. So really I just wanted to share that with everyone and just for people to see how it affects the everyday resident in communities throughout Melbourne metropolitan.

The CHAIR: Sure. Thank you.

Mr CAMASSA: Thank you.

The CHAIR: Mr Forcey, very briefly, please.

Mr FORCEY: Certainly. I have got about one message, and I even presented to a parliamentary inquiry on this in 2015. In 2015 at the University of Melbourne we worked out that the cheapest way for a lot of people to heat their homes is with the reverse-cycle air conditioner, and so since 2015 we have been trying to get that message out there. So this is a possible good news story. I wonder if, in how many homes where people are burning wood, they do not even realise that the cheapest way to heat their home can be with the air conditioner. As a home energy consultant, I go into many homes around Victoria, and people do not know that the air conditioner can be the cheapest way to heat compared to an electric panel heater compared to gas and certainly, if you are paying anything at all for wood or putting any effort into your wood gathering, it is probably cheaper to be using your aircon instead of the wood burning.

An anecdote: I have got family members living rurally. They bought a property. All it had was a wood heater. Two weeks later they have got the air conditioner in there because they find it a much cleaner and more convenient way to heat, and the cost is not going to be high. So that is the main message: people should be heating with their air conditioners where they can. More and more around Victoria more homes have the reverse-cycle air conditioner, but people are scared to use them for winter heating because we have demonised the use of air conditioners in summer, saying they will be expensive, but the message has not gotten across that it can be the cheapest way to heat in winter. That is about it.

The CHAIR: All right. Great. Thank you very much for your presentation and your remarks. We will move to questions now. Dr Bach, I will throw to you first, please.

Dr BACH: Thank you, Chair. And thank you for those presentations. I think I got it right—it was at the start of your presentation, I think, Professor Vardoulakis, and thank you very much for being with us today. I think I have got the statistic right, and I will ask you to clarify and correct me if I am getting it wrong. The figure was something like 600 deaths in Victoria every year that are attributable to wood heating. If that is the case, with a research background myself I would love to understand a little bit more of the methodology behind that figure. I suppose some immediate questions that occur to me as a layman are around whether these people had existing morbidities, the impact of bushfires, as you spoke about, the impact of pollution from traffic, as you said. Or is it honestly the case that you are arguing that every one of those people died not just principally but entirely because of the impact of wood heaters?

Prof. VARDOULAKIS: Thank you for your question. Happy to elaborate on that. So the 650 attributable deaths in Victoria are for the total of anthropogenic PM2.5. It is not only about wood heaters. So that includes wood heaters primarily but also road traffic, the power generation industry, all sources of anthropogenic, human-made air pollution. The way these numbers are calculated is by using the international standard methodology. So we are using epidemiological evidence from global studies to derive exposure response relationships which are applied to air pollution concentration levels and the population size, and then we come up with this number, which is an estimated number of attributable mortality. I want to make it clear that these 650 deaths are statistical deaths; these are not people with a name and address. So this is calculated using a robust methodology to attribute mortality to specific risk factors. The same methodology is used for smoking, for example. There are typically many contributing factors to every death. So air pollution is a contributing factor. But if we estimate the impact of air pollution at population scale, this is equivalent to 650 deaths in Victoria every year.

Dr BACH: Thank you very much. I misunderstood, but that makes things very clear. Chair, given that we are pushed for time, I will happily cede my time to other members who are yet to ask a question.

The CHAIR: Thanks. Dr Ratnam, a question?

Dr RATNAM: Thank you, Chair. Thank you for the incredible presentations this morning. They have been very, very clear and very compelling and have confirmed a lot of the evidence that we have heard to date as well about the evidence being quite clear particularly around wood-fire air pollution and the disproportionate impact of wood-fire heaters on air pollution. I have a broader question. I do not dispute the evidence at all; it is quite compelling. It is very clear to me, and I cannot believe anyone would dispute the evidence that you have presented so clearly. It is more a kind of policy question. I know that you have been doing a lot of advocacy in

terms of trying to get policymakers to pay attention to this issue to get some reform and regulation and laws and a whole range of other things that you have proposed that could actually minimise the harm that this kind of air pollution is causing. I would be interested to know, particularly, Dr Phair, because I know you have been doing some of this work, but it is open to anyone: what do you think some of the barriers to action are? What have you all seen? What have you experienced in terms of advocating for change and then potentially getting an airing and getting a hearing of what you are saying and people believing that but then the action not actually following from that?

Dr PHAIR: Thanks, Dr Ratnam. I am happy to answer that. Thanks for your question; I appreciate it. It is a really important point. Look, in Victoria I have been most heavily involved in this since approximately 2018, so it is now going back three years. I recall attending the first Victorian clean air summit in Melbourne, and that was supposed to be a precursor to a Victorian clean air or a Victorian air quality strategy, which was due to be released—I have lost track of time, but it was about a year and a half ago now.

Dr RATNAM: Yes, 2019, I think.

Dr PHAIR: Exactly. And I think you heard only yesterday that there is in fact still a plan to release this Victorian clean air strategy at some point in the near future, but a draft will not be released for consideration and we still do not know when it is coming out.

So, look, ever since 2018 I along with a range of other clean air advocates—I have been involved with Doctors for the Environment, Healthy Futures, Environmental Justice Australia—a lot of us have worked quite closely together with slightly different perspectives and slightly different emphases. To be honest, it has been quite a long, hard road, and it has been really hard to get answers to certain key questions. For example, we have been asking the EPA repeatedly for access to Victoria's air pollution inventory data for 2016—that is data that is five years old—because I do not want to just offer my opinion on things. I want to be able to provide evidence and provide data, and I would like to seek expert opinions about whether the data is accurate or not, because that is how I can best advocate for my community.

For example, we have also had issues with a lack of air quality monitoring in rural communities, and that has fortunately, at least this year, has changed with increased EPA AirWatch monitoring facilities. But there are still issues in Warburton and Healesville, for example, with air quality monitoring. So it has been a really, really slow, long, drawn-out process. Look, dealing with local government is also very, very difficult. I mean, each local government is its own entity. Some are better resourced than others, and some actually just do not have, I think, the capacity to take on this issue. So you are dealing with a lot of different stakeholders, and there is a lack of coordination. Certainly I think Bronya Lipski at the last hearings described the siloing effect, where agencies operate independently of one another, and there is sometimes a lack of communication and a lack of clear lines of responsibility. So there are a lot of challenges in advocating in this space, Dr Ratnam. Does that answer your question?

Dr RATNAM: Thank you. That is really helpful. It also highlights even more the important role that this inquiry and its recommendations are going to play in the next steps, so thank you very much.

Dr PHAIR: Thank you.

Prof. VARDOULAKIS: Can I just add one point to what Dr Phair has said very eloquently. There is also some kind of romantic picture about wood smoke. So people get it that diesel particles are toxic and road traffic emissions and industrial emissions are toxic and bad for health. It is less understood—there is a less clear picture, less public understanding, of the health impacts of wood smoke. We need to make it absolutely clear that wood smoke is coming from combustion and is producing toxic particles, and this is harming our health—our lungs and our respiratory and cardiovascular health. So we need to make it clear that this romanticised picture about wood smoke is not correct. As we saw from the evidence from Mr Camassa, wood smoke, from wood heaters, can affect significantly human health.

Dr RATNAM: Thank you.

The CHAIR: Mr Hayes. A question?

Mr HAYES: I will forego my question, thanks, Chair. Someone else can have a go.

The CHAIR: Sure. I might ask a question, then, and this is to any of you, really. I am not sure: did you happen to watch Asthma Australia's evidence previously that they gave to this inquiry earlier today? I think a lot of your comments are echoing what they were saying as well. There is a theme in this inquiry, obviously, around education but also particular populations and how they are impacted. It also relates to where they live as well. Your advice to government: what would be the one thing, the most important thing, that you think government should do or should change? In your opinion, what would be your direct recommendation to government? If there was only one thing to do, what would it be as a priority?

Dr PHAIR: Professor Vardoukalis, would you like to start?

Prof. VARDOULAKIS: Yes, I am happy to do that. I would say that the most important thing is to incentivise the phasing out of wood heaters and incentivise clean energy solutions for domestic heating, and we discussed some of the options. There is a clear argument, a strong argument, to incentivise clean forms of domestic energy.

The CHAIR: And I am not sure whether you have all seen but the state government has just released a program to help people transition to gas heating. You know, because one of the challenges in this area is that if you are poor and you cannot afford to update your heating and your only source of heating is a wood heater, or you could be a tenant living in a property where your only source of heating is a wood heater, you do not have the ability to change that, so there are a couple of challenges in this space. I think sometimes people just think, 'We'll ban it all, and the problem will go away', but it is actually not that easy. So do you think that is a good idea in terms of the transitioning to gas? I mean, I know our government has got a really strong program for transitioning to clean energy as well, but one of our previous witnesses talked about phasing out wood heaters in homes at the point of sale. What is your view about that idea? Do you think that is an appropriate mechanism as well, or do you think that is not fast enough?

Mr FORCEY: Well, I would not be transitioning to gas, because that can cost you three times as much as using an air conditioner. And I know the Victorian government is interested in getting to zero emissions at some point, so you will not do that by burning fossil gas. The Victorian government does have some programs in place promoting the use of air conditioners versus gas. I mean, gas can also kill you with carbon monoxide poisoning and that sort of thing. So a movement to air conditioners, which are basically heat pumps that get free renewable heat from the air outside your house, and that is why they are so cheap to operate, so a transition to heat pumps, reverse-cycle air conditioners.

The CHAIR: And what about the point about doing it at the point of sale of a house. Do you think that is quick enough or not quick enough, and if it is not quick enough in your opinion, how else would you look at it? If you were advising us about policy, for example, what would you—

Mr FORCEY: My number one item would just be to try to educate people that reverse-cycle air conditioners can be cheap. More and more homes in Victoria are getting reverse-cycle air conditioners every day, but for summer use, so let us educate people they can be used in winter, and we might even find some of those people were thinking of burning wood. Well, now they will not have to.

Dr PHAIR: Chair, look, I agree with Tim. Look, education is critical and especially in rural communities who love wood heaters and who often have got a whole culture associated with going and collecting wood, and it is a family activity and it is what we have always done. So there are major cultural factors which need to be acknowledged and need to be respected. I mean, the problem we have got is that we have actually have, as we have heard previously, 85 per cent of wood heater sales going into rural communities, and these are mostly small towns. All are on the grid, so all have access to electricity. On a nationwide level the data I have heard is that 40 000 wood heaters are going into Australian homes nationwide every year, so we actually need to work out a way of transitioning that involves selling fewer of these devices and installing fewer of them as well. So that means working with, I guess, major retailers such as—if I can name—Bunnings, who are prominently selling all types of wood-burning devices, but it also means working with smaller local retailers who are often family-run businesses in rural areas who have a loyal clientele who love their wood heaters. So ideally we would have some kind of a strategy where we work with these businesses who actually have, often maybe, their family income tied up with that business model, and we need to work out a way of actually transitioning not just from wood heaters but also away from gas towards cleaner options. Look, the options are out there. I have

heard a quote that really it is possible to use reverse-cycle air conditioners to heat your home for a year for a total of \$150, so this technology is affordable now.

Prof. VARDOULAKIS: Can I add to that, Chair, that if we take into account the cost of ill health and mortality attributable to fine particles and smoke from wood heaters, then incentivising renewable energy and incentivising clean energy in domestic heating options becomes cost effective. So it is worth investing in clean energy options. Gas is not a renewable energy. Solar or other renewable energy sources are much more preferable, and that would make financial sense if we took into account the costs associated with mortality, hospital admissions and treatment of people suffering from lung and heart disease associated with the wood smoke.

Dr PHAIR: And you have already heard the evidence to that effect: anywhere from \$4000 to \$6000 or even, according to one recent study in the *Medical Journal of Australia*, an estimated health cost of \$6000 to \$10 000 per wood heater per year. So these costs are huge. Now, again, as I think we were discussing before, Dr Bach, we cannot demonstrate the clear correlation. This modelling is done using epidemiological techniques which are quite sophisticated. They are proven techniques, and they are approved within the profession; all of these studies have been peer reviewed. So the economic costs of having wood heaters in our communities are really significant.

The CHAIR: Mr Camassa, is there anything you wanted to add there?

Mr CAMASSA: No, nothing. Thank you.

The CHAIR: Okay. Great. Mrs McArthur, a question from you?

Mrs McARTHUR: I am just wondering if the professor could tell us about the effects of smoking in a house and in public venues, where it is allowed, or passive smoking. How does that affect people's health?

Prof. VARDOULAKIS: Tobacco smoking affects human health through the inhalation of smoke. This is a mixture of multiple pollutants. In some ways it is similar to wood smoke. So there are many constituents—chemicals, fine particles—that come from tobacco smoking, and the same happens with most combustion sources. There will be emissions of fine particles, of gases, of volatile organic compounds. Some of these compounds are carcinogenic, and this kind of exposure over a number of days or over a number of years can have an impact on health.

Mrs McARTHUR: So have you been able to eliminate passive smoking or actual smoking from any death statistics—separate it out from the effects of wood heaters?

Prof. VARDOULAKIS: In many cases different sources of air pollution act synergistically. So people who smoke may be at higher risk from wood smoke because they have a compromised respiratory system because of the tobacco smoking. And the same we experience with other forms of pollution. So pollution from different sources can affect human health. It can have a synergistic effect, and people who smoke might be more vulnerable to wood smoke or other sources of air pollution. We have also seen in other countries, to add to that, that people who have been exposed to high levels of air pollution might be at higher risk of dying from COVID-19. This is because their respiratory system is compromised, their immune system is weakened and they have a higher risk of contracting COVID-19 and developing more severe disease. So air pollution is a risk factor which can increase the risk of other well-established risk factors, like smoking or respiratory infections.

Mrs McARTHUR: Could I just ask Dr Phair how he has canvassed rural doctors for this view about wood heaters, because I have spoken to members of the Rural Doctors Association. They say they were not canvassed for this position to be advocated on their behalf.

Dr PHAIR: This is an issue. Our members have strong opinions, actually, specifically on climate change and also on air pollution. This is certainly an issue that is of great interest to our members. Most of my work with Rural Doctors Association of Victoria is for other forms of rural doctor advocacy—so, for example, we work on issues around the rural medical workforce and workforce retention and addressing issues around, for example, workforce shortages specifically in rural maternity services. So we have got a broad scope. We operate across a broad scope of issues, and it is really quite challenging to stay across all of these issues. I also appreciate—

Mrs McARTHUR: Yes, so can you confirm, Dr Phair, that this has not been a canvassed position of your members?

Dr PHAIR: We do not have a formal position paper on this particular issue—

Mrs McARTHUR: So is this your position?

Dr PHAIR: I am speaking as president of the Rural Doctors Association of Victoria, and I advocate for rural communities. I advocate for the health of rural communities, and that is who I am representing.

Mrs McARTHUR: But you can confirm that rural doctors who are members of your association have not been canvassed specifically for you to take a position of opposing wood heaters.

Dr PHAIR: We have discussed this issue, certainly, at committee and board level. We also certainly are very open to feedback from members, and certainly members are very happy to provide feedback on this issue, but we do not have a formalised position paper if that is what you are referring to.

Mrs McARTHUR: All right. I am referring to that.

The CHAIR: Thank you. I think the question has been answered. With that, I am afraid we are out of time. I would just like to thank all of you for coming and presenting your evidence to us today and speaking to us about this issue. I know it is an important issue that affects many rural communities. I would just like to thank you for the work that you do as doctors and GPs in your own communities and thank you again for coming along.

Committee adjourned.