T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into the Health Impacts of Air Pollution in Victoria

Melbourne—Monday, 28 June 2021

(via videoconference)

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

Dr Roderick McRae, President, Australian Medical Association Victoria; and

Dr Lai Heng Foong, Chair, Public Health and Disaster Committee, Australasian College for Emergency Medicine.

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 are gathered on today, and 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 may be watching these proceedings via the live broadcast as well.

I will just take the opportunity to introduce committee members to you who are Zooming into these proceedings today. I am Sonja Terpstra, the Chair of the Environment and Planning Committee. Also with me via Zoom are Dr Samantha Ratnam, Ms Nina Taylor, Dr Catherine Cumming, Ms Melina Bath and Mr Cesar Melhem.

All evidence 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 things, 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.

Dr Lai Heng, I might start with you, if you could please state your name and the organisation that you are appearing on behalf of.

Dr FOONG: My name is Dr Lai Heng Foong, and I am representing ACEM, the Australasian College for Emergency Medicine.

The CHAIR: And same, Dr McRae—if you could please state your name and the organisation you are appearing on behalf of.

Dr McRAE: Certainly. It is Dr Roderick McRae, and I am the current President of AMA Victoria.

The CHAIR: Great. Thank you. Now, what I will do as there are two of you on this panel today is I will invite each of you to make an opening comment. If I could get you just to keep them to about 5 to 10 minutes maximum, that will then allow members plenty of time to ask questions. Perhaps, Dr McRae, we might start with you, if I could get you to commence your opening statement, and then I will come to you, Dr Lai Heng.

Dr McRAE: Thank you. I draw the committee's attention to the submission that we provided. It was actually over the signature of my immediate predecessor, Professor Julian Rait, for ease of access, but none of the information has altered. AMA Victoria is the main body representing all medical practitioners within Victoria, and we regard this as a very important matter. It relates to disease burden, particularly respiratory disease, and let us face it, we are in the middle of a global pandemic which is a profound respiratory illness. Everything is testing the resources. The other element relates to cardiovascular disease. Various submissions have been made really since 2010 to various organisations, including the national Senate through AMA Limited, which is the national body, as opposed to AMA Victoria, being within the jurisdiction of Victoria.

So we are very concerned with respect to the elements around this, particularly the apparently increasing particulate matter that enters people's lungs and contributes to both respiratory and cardiovascular disease burdens. There is in fact, now well-regarded, an important mortality associated with this, and AMA Victoria is

very supportive of mitigating works to reduce the particulate matter that it is in the environment. And we of course acknowledge, like so many things, nothing sticks to the jurisdiction boundary. Nonetheless any interventions that might be undertaken, particularly related to combustible fuels, one of which is wood fire, we would support, and we are much more in the carrot rather than the stick department relating to that.

We know that there is personal involvement, at the personal level, so we are aware that still too many people individually make what we regard as a bad decision to smoke cigarettes. That contributes to carbon monoxide and other various poisons. In addition, we know that there are episodes that also lead to increased morbidity and mortality, and that is bushfires and open-cut mines catching fire and putting particulate matter into the atmosphere. Any of these episodes exacerbate what is going on. This has been known to humans from the London pea soupers and just disease spread. We have seen horrible pictures, particularly India and China, in Beijing, and we do not want to have that sort of circumstance.

So broadly anything we can do to encourage less particulate matter getting into the environment is supported. We would encourage more personal activity—so walking or riding a bicycle as opposed to using a motor vehicle, particularly for short hops. Perhaps the pandemic is going to resuscitate local communities. We do not know where that is going to go.

It would be very interesting to have research undertaken to monitor the particulate matter in and across various circumstances, including with the various lockdowns—if there has been reduced use of motor vehicles in particular, if that has led to less particulate matter—and it would be very interesting to follow up to see if there is reduced disease burden, and then there is the impact on, say, public hospital emergency departments, which I am sure my colleague will elaborate on. Thank you, Chair.

The CHAIR: Thank you, Dr McRae. Over to you, Dr Foong.

Dr FOONG: Thank you very much for the opportunity to report to the Inquiry into the Health Impacts of Air Pollution in Victoria. The Australasian College for Emergency Medicine is the peak body for emergency medicine, and I am the current Chair of the Public Health and Disaster Committee. I would just like to also draw your attention to the submission that we prepared for the inquiry in March 2021, and I would like to highlight a few points.

Air pollution is a significant cause of mortality globally. Eight million people are known to have died due to air pollution. I wanted to highlight a case of a nine-year-old in the United Kingdom. Her name is Ella Kissi-Debrah. Hers was the first case of death where air pollution was listed as a cause of death. She lived near an area in London that had notoriously very high levels of pollution. I am sure she was not the first, but she was certainly the first, by a coroner's court, to be listed as having died of air pollution.

Specifically, I wanted to highlight the point that although we have national air quality standards that the Victorian government adhere to, and also globally, many experts in this field have actually said that there is really no safe level of pollution that could prevent morbidity and mortality. Although Australia has a lower threshold of air quality standards compared to the United States, we are still vulnerable to the impacts of air pollution, and as an emergency physician I see firsthand people who present to my emergency department due to effects of air pollution. That includes acute as well as chronic impacts, the acute ones being most felt in the bushfires in late 2019 and early 2020, where we saw at least a 30 per cent increase of respiratory and cardiovascular presentations to emergency and also a large increase in ambulance call-outs due to the hazardous air pollution.

Specifically in Victoria I just want to highlight the fact that Victoria has always been vulnerable to bushfires, and this vulnerability was best captured in the Black Saturday bushfires of 2009, which claimed 173 lives. We know that air pollution has caused up to 2600 deaths in Australia annually, and that is probably projected to increase with the level of pollution and CO_2 emissions rising and the fact that we are expecting more extreme and more frequent natural disasters occurring. So as someone who is in emergency medicine at the front line of seeing health impacts as well as someone who is a public health practitioner, I would really like to encourage the Victorian government to change their policies regarding how they are going to go towards net zero emissions as well as consider modifying their policies about electric cars, and also encourage community members to use public transport, making that available, as well as encouraging more transport via bike paths, for example.

Also I would like to recommend that we have a broader strategy in terms of a national preparedness agency, looking at all sorts of natural disasters. Also I would like to recommend that we have a lot more community education projects in terms of what to do when there are hazardous levels of pollution. As my colleague from the AMA mentioned, there are many different impacts of air pollution, not just limited to respiratory and cardiovascular disease but also in terms of its impact on pregnant women and their unborn foetuses, including increased levels of low birth weight of babies being born. It also has indirect impacts on our vulnerable populations, such as older people and also people living in lower socio-economic groups, who may experience poorer housing quality and lower health literacy and limited ability to adopt preventative measures. With that, I would like to conclude my opening remarks, and if you have any questions, I welcome them. Thanks.

The CHAIR: Great. Thank you, Dr Foong, and thank you, Dr McRae. All right, we will open up for questions. Let us start with Ms Bath, if you have a question first-up.

Ms BATH: Thank you very much for your presentation. It is always very instructive when we have people of such high calibre and expertise coming on and making commentary for us. My electorate covers off the Latrobe Valley, and there is a particular proposal called the Used Lead-Acid Battery secondary recycling plant that has had the green light from the government to go ahead in the industrial area. It is zoned as industrial, but it is also 1.7 kilometres away from the Hazelwood North Primary School. I say that in the context of your commentary around, I guess, first of all—and not wanting to be inflammatory or anything—the death of a young child in relation to air pollution. I guess I would like to get my head around lead pollutants and those emissions and about how lead enters the body. Walk us through that. Is it just airborne, inhaled, or is it also through the skin? What are safe levels for children? Just sort of unpack some of that, I guess, toxicity in children. And I have got another couple of other questions just relating to the science around it, if you can.

Dr FOONG: I am not an environment health expert, I am an emergency physician, so I do not know the specific levels of lead that are allowed in drinking water but certainly I know that the modes of transmission of lead could be through contaminated water but also through the air that we breathe. Plus lead has chronic manifestations in terms of its impact on brain development and also just in general development of children. I do not know the specifics, so I would not venture to talk about something I am not expert about, but certainly lead is one of the pollutants contained in air pollution that could contribute to ill health. But I am not sure about the exact amount that is allowed and things like this. Lead poisoning is definitely something that is more of a major problem in developing countries. It is to do with leakage into our water supply and its impact that way and also with contaminated air. But I am sorry I cannot give you more detail.

Ms BATH: Dr McCrae, is that something that you would like to wade into?

Dr McRAE: Absolutely. Look, in the same way I am not going to pretend that I am an environmental health expert, but I have got access to them and frankly the specific science around what you are asking is readily available. Look, I might hasten to say I was not anticipating getting into a discussion about lead and battery recycling. We have to fit in with the community and expectations. When anybody hears about the concept of lead, immediately red flags go up: 'This is a dangerous product'. It has been available and there is knowledge, including from around Australia, about the ingestion and inhalation of lead. Lead was in petrol; it has been removed from petrol. This has seen a reduction in the amount of lead that has been, in particular, in children. It has been in paint in old houses. If children ingest flakes of lead paint, they do not do so well. It affects their ability to have their brains develop and learn, and there are sequelae from all of that.

The next question goes: is the concept of recycling a good idea? Broadly yes, and so AMA Victoria would be supportive of that provided the correct and sensible approaches are ensured. It is not ideal to just have people bashing open old lead-acid batteries next to a creek which then, say, wanders through the primary school that is not so far away. However, if it can be done safely with a high assurance that there will be no leakage of lead into the environment, that becomes a different situation, and then it becomes, 'What are we going to do with the lead that is recycled or recovered? How is it going to be managed? Is it going to be moved to the factory next door or is it going to be flown to America?'. All those sorts of things need to play into it.

So if something can be based scientifically and soundly, recognising there can never be a 100 per cent guarantee of no problems—for example, factory fires have occurred; that is going to release chemicals into the atmosphere—then you try to do it in as sensible a location as you might. So really what I am discussing are commonsense principles. So we can see we would not stick something like this right next to the GPO in the city of Melbourne, because that is a highly dense population—at least I will qualify that by saying it was; who knows what is going to happen in the immediate future? It needs to be located safely and sensibly and

constructed well—you do not want to have a building fall down 40 years later if it is going to have a planned 40-year or 140-year life—and every check and balance needs to go in to minimise the potential of leakage of what is known to be a toxic product.

Ms BATH: Thank you. Chair, one supplementary on that: I will not call you to task, but I will just make mention that the people who live in that area would consider themselves as precious as the people that live in the CBD and next to the GPO or whatever. But in no way was I—that was just a comment.

Dr McRAE: No, and neither was I. Let us face it, nobody wants anything potentially harmful within 100 kilometres of where they reside.

Ms BATH: Thank you.

Dr McRAE: We have to take that on board, and I think that is just as important a factor, because then we move from potential harms through physical harm—ingestion and inhalation—into mental health harms, which is something that is also at play.

Ms BATH: So let us look at the potential if it goes ahead and then the types of monitoring that the AMA would like to see or that communities should expect. In terms of monitoring—and I will use again the children, because their school is quite close—could you explain, and you may need to take it on notice, that you can take blood toxicity levels but there is also assessment via the bone for toxicity in children. Could you provide some comments to the inquiry on that?

Dr McRAE: I believe you are correct, and it is likely also possible to forensically examine hair. I note that in order to examine bone you have to provide bone, and it would be an invasive procedure in a live person, and perhaps it is often done post mortem. So yes, it can be done. But what I would suggest is you want to have minimum exposure. So ultimately the specifications for any effluent coming out of any factory such as this should produce something like fresh water and that is it. So you need appropriate scrubbers to be able to remove any pollutant before it goes into the environment, which of course would completely undermine what I said about not putting it next to the GPO. If you can get to that, then terrific. And so that needs to be the aim.

The medical profession, ultimately one of its underpinning principles is, 'Do no harm', so we will support anything that is sensible and wisely thought through. We understand we have got the engineering technologies to do marvellous things, so we are about to launch people into space in return vehicles. We are contemplating moving to Mars, maybe the moon, and we have had people living underwater and in outer space. So we can do stuff, and ultimately it becomes the economic balance of how hard you want to go and what expenditure for what outcome. And we are very interested in good, sensible, stable health outcomes.

Ms BATH: Thank you. And thank you, Chair.

The CHAIR: Great. Thanks, Ms Bath. Ms Taylor.

Ms TAYLOR: Thank you both for your respective contributions today—very helpful. So you mentioned about cigarette smoke. I was just checking—you were principally focusing on people's responsibility with the damage they cause to themselves, but is there also an aspect of it also causing pollution? Because I had not focused on that other than the irritation of it being in close proximity. I am not trying to open up a debate, because that is a whole other angle, but I am just wondering what that contributes in this space.

Dr McRAE: To whom were you directing your question, Ms Taylor?

Ms TAYLOR: Well, whoever wants to answer—or both. It is hard for me to assess where your expertise is.

Dr McRAE: I made the comment, so perhaps I will commence by doing it. It was really in the background but saying most of the disease burden related to air pollution relates to cardiovascular disease and respiratory disease. My observation is that some people make a decision to inhale cigarette smoke, which is hot, contains particulate matter and contains chemicals which are broadly top secret—you know, it is a bit like Colonel Sanders's 11 secret herbs and spices. I do not know what is in them. We can even move into vaping—I do not know what is in those products. I do see the outcome—that they are harmful.

There are many things in and around the consumption of cigarettes. So there is disposal of cigarette butts, which contain pollutants. They end up on the street, because people tend not to dispose of them that wisely. They get into the gutters. They are washed down sewerage and they end up in, say, Port Phillip Bay or the coastal regions, wherever the effluent goes, and those chemicals are there to be ingested by whatever happens to be wandering past—or where the water goes past them if they are filtration species.

Then there is the smoke itself. So there is the individual. In one way I am very grateful to all of them, because they are filtering those pollutants and particles on my behalf when I wander past them. We are aware that there are health impacts of what is called passive smoking, often in the workplace, and there have been significant legal considerations and payouts to some employees or workers related to that.

So that is at one level—and then probably somebody could sit back and calculate that while the contribution to the global atmosphere impact of cigarette smoke from one smoker is trivial, when you add up all of the smokers around the world it probably is starting to get there. Now, I do not know whether it is the same as one semitrailer beetling up the Hume Highway compared to every person smoking, because I do not have that level of knowledge, but I bet somebody out there does. If you like, I will undertake to take that on notice if it is an important consideration.

The next thing is: we know that cigarette smoke has a massive disease burden, and it moves just beyond the acute—by which I mean, say, bronchospasm or asthma—and pneumonic processes into chronic, such as chronic obstructive pulmonary disease, people bouncing in and out of hospital. Any of us—we all look healthy; perhaps I will exclude myself from that—when we are exposed to some harm, might get a trivial illness. Some people end up in hospital, some people end up on a ventilator in intensive care and some people are unable to be weaned from that mechanical ventilatory support, and they end up dead. So they are the mortality figures, so there is an awful lot in and around all of those particular points.

Dr FOONG: I just wanted to add to that that, you know, when we talk about air pollution we mean the ambient air that we breathe, and the four main things that are involved in air pollution are the particulate matter 2.5, particulate matter 10, ozone and nitrous dioxide. Although smoking figures in particulate matter, it is more I guess the individual person smoking it and what is involved, so when we talk about air pollution as in this inquiry, it is about in general the air that we breathe and what they measure as the PM2.5 and PM10 and the ozone. That is why in my submission I did not go into smoking. Both smoking and air pollution have been linked to increased incidence of lung cancer and exacerbations of asthma and chronic obstructive airway disease, but I guess air pollution is separate from what is emitted by smokers.

Ms TAYLOR: Thank you. I appreciate all of that. Very helpful, you know, in the context that we are dealing with. I will let other people ask questions, but as you raised that point, I thought, 'Well, let's go there; let's see what's relevant'. Thank you.

Dr FOONG: Sure.

The CHAIR: Great. Thank you both for that. I might just ask a question, if I can, at this juncture. I will ask it to both of you. Dr McRae, I will ask you first, and then ask you to supplement, Dr Foong. How could the state government better support health professionals in responding to acute air-quality events? So I guess is there something that we could improve on in assisting the profession when there are some? You have probably seen there have been some toxic fires that have occurred in the western suburbs and the like. Is there something that could be improved, or do you think it is okay the way that government agencies respond to assist health professionals? What could be improved, if anything?

Dr McRAE: Thank you, Chair. I think it is relevant that there needs to be appropriate documentation of what is in every building, particularly in industrial zones. Now, I am alert to the fact that that is not necessarily easy and not everybody tells the truth and all those sorts of issues, but certainly to do as best you can. We have certainly got all of the hazardous materials identified, so if an alert can go out very early—not waiting for the 6 o'clock news, but really it is almost down to microphones in the street to alert people to be careful—then a decision needs to be made about: is it reasonable to stay in your house with the windows closed or go to a relative or a friend or another location because this is a big bad fire? I said 'fire', because it is generally the perception that I have. The same could apply for leakage of bad materials into waterways and that sort of thing, and people downstream need to be made alert.

Also there needs to be a mechanism to notify nearby public hospitals, particularly the emergency departments, that something is afoot—to be alert. Now, somebody will need to make a call that actually we need to cancel all elective surgery for the next three days because we expect these resources to be overwhelmed, whether it is just a bed for, typically, oxygen administration to assist people. And recognising that anybody affected is going to be anywhere on the disease spectrum, from the newborn baby that we have just heard about to an elderly person living on home oxygen who may have just had a heart-lung transplant. Anything could be out there. So it is really about having a systems process in place in order to capture information, analyse it—this is the one we need to notify pretty broadly and then trigger all the mechanisms, so it would be the emergency services, probably local government and then, I expect, there would be a handful of other processes. But I think that the broad process that we would support is early warning, useful information disseminated rapidly, and then the knowledge of what to do once you receive that information. So there might be a whole lot of fridge magnets going out there.

The CHAIR: And does that not happen now, or is there something there that does? Because I think there is something there, but are you suggesting it needs to be improved? Could you just clarify?

Dr McRAE: That is exactly right. Look, I do not want to say that they are informal mechanisms. There will be some formal mechanisms, but they just need to be coordinated and, in addition to that, rehearsed. So it is all very nice to have the system, but if it is in the third folder on your back shelf in your office and I do not know about it, that is not so helpful. So a routine, regularised practice would be sensible. So somewhere in springtime you might say, 'Gosh, I think we're going to have some bushfires coming up' or—you know, nobody can program or plan when an accidental, say, factory fire occurs, but it needs to be just built into people's lives: 'Oh, yes, we're going to practise this in a month's time, and this is what we're going to do'. So build it into the culture of the community.

The CHAIR: So I think you are talking to two things—and I will come to you in a moment, Dr Foong. One is making sure there is a way of gathering all this information.

Dr McRAE: I just lost you.

The CHAIR: Sorry. I think what you are saying is: make sure there is a way of gathering all this information so when there is an event that information can be provided, but then also a rapid response to assist, you know, hospitals to prepare and the like. So if there is an influx of people who are impacted, you can deal with them and be prepared. So it is kind of like a two-step approach there.

Dr McRAE: That is correct. And there is disaster planning available in the public hospitals, but again, everybody needs to practise it, not just know the theory—and away we go.

The CHAIR: Okay, great. Dr Foong?

Dr FOONG: Okay. First of all, I just wanted to mention the big mitigation measure, which is that we go towards more sustainable energy sources and electric cars so that we decrease the CO_2 emissions, but in terms of specific things that the Victorian government could do, definitely you could improve infrastructure to enable real-time air quality monitoring. So the Victorian EPA already has this AirWatch service, which gives an hourly real-time measurement, but this could be further localised into more areas, especially the areas that are more at risk, that are close to a coalmine or close to factories or things like this. There is definitely a possibility to have more ambitious air quality targets so that people could have less risk of being exposed to hazardous air quality.

In terms of indoor air quality levels, I am thinking about schools and childcare centres. Certainly during the time of bushfires there must be better indoor air quality monitoring. I live in Sydney, but when we had the bushfire, that was the concern. So there was a lot of parental concern about whether people were allowed to go to school or not.

In terms of early notification, I really support Dr McRae's suggestions to have some sort of early notification, especially when Victoria is particularly vulnerable to bushfires and thunderstorm asthma events. Definitely we should have some sort of early notification.

In terms of addressing emissions, shifting towards electric vehicles for government vehicles and also public transport would be a good idea. I know the City of Sydney has committed to electric buses for the whole of City of Sydney by a certain time. I think it is 2030.

Then in terms of community messaging, I think that needs to be improved. So when there is hazardous air quality there should be some sort of government announcement to let pregnant women know and let women with children know when it is actually not safe to be out and also to look after the elderly, to get people to check on their elderly parents or grandparents when the air pollution level is particularly high. Then there are also other ways to, I guess, improve air pollution by standards of vehicle emissions and things like that, but it is mostly about controlling air quality standards, real-time air quality monitoring and committing to renewable energy and decreasing CO_2 emissions.

The CHAIR: Great. Thanks, Dr Foong. You may not know, being in Sydney, but we do also have the VicEmergency app, so if there are any incidents, people are notified. Whether it is a bushfire or some other incident—it could be a house fire or whatever—if people have that app on their phone, it does give some emergency response. I am just not sure—it goes to the point that I think Dr McRae was talking about earlier—how that interacts with emergency services and hospitals. I am sure it impacted emergency services in terms of fire and those sorts of services, but my question was more around: how do we help hospitals prepare? Just for your understanding as well, the Victorian government has committed to turning over its fleet for low-emission vehicles, and we have got a zero net emissions target as well. So we are well on track to achieving all of those things, which you may aware of, but being in Sydney anyway I just thought I would bring that to your attention.

Dr FOONG: Great. Thank you very much. Yes, always linking into the emergency and hospitals is really important, but community messaging is really important too. During the bushfires in New South Wales I do not think there was enough community messaging. I saw people going out without masks, still walking, doing their usual thing, and the air quality level was 10 times above what is considered acceptable. We do not know yet, because we do not have enough prospective data, how damaging it is to be in 10 times the air pollution level and what it does, acutely and chronically, in terms of your health outcomes, so it is really good to just be having that kind of messaging to people.

The CHAIR: Yes, and the Gippsland fires just recently for us down here in Victoria, they were catastrophic. I thought the advice was to stay indoors as much as possible because the air quality was bad. They were very catastrophic fires and I do not think we have seen anything like it. But nevertheless, there are always lessons to be learned from any sort of large, major events like that. And as you say, only time will tell to see the long-term impacts of those sorts of incidents and bushfires. And as we know, climate change—we are seeing more frequent, more severe events as well. So there are definitely some challenges there. All right. Thank you, Dr McRae and Dr Foong, for that. We will go to another question, this time Dr Cumming.

Dr CUMMING: Thank you, Chair, and thank you, Dr Foong and Dr McRae. I am not quite sure if you are aware that there has obviously been a lot of research done here in Victoria. There is a lot of research afoot even from the University of Melbourne—their Lung Health Research Centre—as well as the Royal Children's Hospital and the Murdoch research institute. They have found a lot of data around children and pockets of asthma, being that obviously children do not smoke but they are actually presenting with illnesses that would look like a smoker. They are in pockets of quite high-pollution areas, such as the City of Maribyrnong in my Western Metropolitan Region.

I would be hoping that both of you—both doctors—would be able to actually provide this inquiry with more research data that you are aware of that might inform us, that might actually help look at the collection of data. I understand that you would probably want more research around this topic of air quality or air pollution. And I have a real bone to pick about calling it 'air quality' when really we are talking about pollutants and air pollution. So I guess I am wondering what other collection of data would be helpful for the health of Victorians, being that I know that recently, in the last couple of years, some of the fires that we have had, such as the West Footscray fire—many people in that immediate area had health complaints, and they really do wonder where that data is actually being collected and is someone capturing all that data so that they could actually see the long-term effects. I also know that the firefighters union that attended all those fires are always interested in collecting that data on behalf of firefighters that are always put in harm's way in the way of poor air and being exposed to those particulates.

Dr FOONG: Particulate matter, yes.

Dr CUMMING: Yes, the PM10 and the like and all the other carcinogens that they may be exposed to. So yes, from listening to some of the answers that you have just given I am guessing that you would see that this Victorian government would benefit the community widely to have an education campaign. You said earlier, Doctor, that you would believe that the community should maybe practice and understand, when they are exposed or feeling asthma or the like, how they could actually feed that data in. Obviously we have experienced thunderstorm asthma and those kinds of events.

So yes, I guess health promotion and public health through the development and implementation of a whole-of-government quality and health promotion strategy, I believe, would be beneficial—and I am not quite sure if you both would agree on that—as well as one thing that this COVID pandemic has exposed: that we actually need to integrate the GPs, community health and councils. And I think apart from having a virus approach, it would be good to have an air quality and pollution approach as well. I will let you answer those, and feel free if you cannot answer it in the next 15 or 5 minutes, to please forward onto this inquiry any further information or any research documents that would be helpful—

The CHAIR: I think you mean 'questions on notice', Dr Cumming.

Dr CUMMING: Those are the words that I was looking for. Thank you.

The CHAIR: But anyway, if you could allow the witnesses to answer, that would be good, because there are other people who need to ask questions. Who would like to go first, Dr Foong or Dr McRae?

Dr FOONG: I can go first. I have actually recently given GPs a lecture on current research on the health impacts of air pollution. I agree with you—it should be called 'air pollution' rather than 'air quality'—but you know, I am kind of trying to adapt to the situation. I have a presentation that talks about what PM2.5 and PM10 can do to the respiratory system, to the cardiovascular vascular system and to pregnant women, so if you are interested in something like that, I can send it to you. It is just that it is not in the terms of reference of this air pollution submission, but I have that knowledge.

Dr CUMMING: Sorry, Dr Foong, it is, because we have got a little part that says 'other'. So anything 'other' that would help, we accept.

Dr FOONG: Okay, that is fine. I can submit that. In terms of health promotion and community education, I definitely think that is an area that is not well developed. As I mentioned in answering the previous question, I think there is definitely a lot more scope to target communication strategies, especially to vulnerable members of the community. We certainly have enough sophisticated technology now so that we know when we are getting periods of bad air pollution. When we have a bushfire, we are definitely measuring these indicators, and we should be telling people to wear N95 masks and P2 masks, really. I have experience trying to spread that kind of messaging. It is something that needs to be done, and our college would definitely support that.

Dr McRAE: Thank you. That was a very broad approach to almost everything, and it is difficult to know where to pick the eyes out of it. So again, speaking on behalf of AMA Victoria, you are correct. I see it, just as a citizen, as semantics about using words like 'pollution' versus 'quality', but frankly I think most people will get it. If you prefer, you can call it 'pollution'—and we have no objection, because that is broadly what it is—and equally, if the quality gets a deeply negative 100 score, people are going to go, 'Hmmm, that's probably not fantastic to start with'.

In terms of research, we are always in favour of research, but it is not an end in itself. I also note that any time cost containment comes along research is one of the early things to be chopped, and it is often to the detriment. I will take this on notice to reach those various people, although probably your own researchers would be able to locate anything via a standard literature search to address any of those questions, but I would be very pleased to be of assistance to the inquiry. Ultimately, research is a good. Then there is how you undertake the research. We could organise that two weeks after a big episode everyone gets a thump on the door at some stage and a quick, 'Fill this in', if they happen to be home and all that sort of thing. Usually it is an invitation to participate. It is quite a process and a rigmarole, the consent process et cetera—well, it is approval and consent—and then somebody has to sit back and sift through the data and look for interesting and significant findings. That is all okay.

You mentioned several acute episodes, and you mentioned thunderstorm asthma. That is a specific allergic phenomenon. Some people are more sensitive to that than others, and of course if they are experiencing an acute episode, they will maybe start with their general practitioner or they might rely on 000 because they know that they are that crook in their setting that they need to get to a hospital, and the hospitals need to be alert, so that is one line of communication. Then in the background, as I mentioned earlier, any citizen is going to be at any point in the curve. So they might be in the middle of COVID-19 right now and the thunderstorm comes along or the factory next door burns down, or, or, or. So it is difficult to work all of those things through. So, again, it is an understanding of what might be present, what could the exposure be, how serious is it going to be. So if the fire zips past and I can hold my breath in the time that it zips past, that is going to be completely different to the forest next door being on a slow burn for three weeks, and again the Mallacoota experience demonstrated that. So one thing could be that, regrettably, I say, the next time that sort of episode occurs we make sure that we swing the Royal Australian Navy by with a couple of big ships to be able to evacuate people. It is all about the planning and the communication, and of course that is interaction with several other networks.

You mentioned the fire brigade. AMA Victoria has members who are the general practitioners and/or the specialists of those fire brigade offices. We understand the implications of OH&S legislation. So we are certainly very supportive of, when any worker, really in any situation, is perhaps not quite thrown in front but they place themselves in that point of danger, having appropriate equipment. Generally there is good hazard minimisation for those workers and they have their own oxygen supply. Clearly we need to have monitoring so that when their clean oxygen supply is about to run out an alarm goes off and they can go and either get another bottle or 'That's enough exposure to that' and have 15 hours off, whatever the case may be, because we need those individuals to maintain their ability to work and look after the rest of us. So there are no difficulties around our support for all those sorts of instances as well.

The final point I would make is on the theme that every individual will have a relationship with their medical practitioner. We recommend that every citizen in Victoria have their own general practitioner, and not just dial-a-crowd for a quick script or a quick referral but a good relationship with their general practitioner so that the two of them understand where they both are in their relationship. Some of those people have underlying respiratory disease, and as Dr Foong mentioned, some of them are going to be pregnant, and so there is a modification and there are other practitioners involved. Some of the patients will have a respiratory physician because they have a known underlying respiratory disease, which could be at the acute-type end, such as asthma, or at the chronic-type end, for whatever reason and exposures they may have had. They just need to deal with that. Then within those relationships the experience of somebody who is 21 with an acute episode is going to be completely different to somebody who is 91 and at the end stage of chronic illness, and it just has to work through that sort of relationship. So at no point would we support kidnapping an individual and thrusting them into some sort of medical care process because we can against their will. So there are a lot of conversations along the way.

But you started out touching on research. We would support research, and it may well turn out that everything I have just stated turns out to be completely wrong and every 91-year-old at the end stage of respiratory disease wants everything thrown at them, and that would be okay because that is the business that medical practice is—to really get the best health outcomes in the individual's circumstances. But research, yes; support for a good safety mechanism; recognising all the industrial requirements within the law; and broadly being sensible, because everything we have just discussed has an economic cost associated with it. Whatever we do we understand that resources are limited and it takes clever minds to allocate them appropriately, looking to get the best utility for the community.

Dr CUMMING: I guess, just to add, Doctor, obviously we are worried about air quality. What causes asthma in the way of air pollutants as well as what plants cause asthma or affect the air quality? They are some of the things that, I guess, we all know in the way of research that can trigger episodes, and what—

The CHAIR: Sorry, Dr Cumming, if I could just interrupt here. We have got about 5 minutes left with this session, and I know Dr Ratnam has not had a question yet, so I will just throw to Dr Ratnam. If anyone has got any other comments or questions, they can be put to Dr Foong or Dr McRae on notice, and they can respond. Apologies, Dr Ratnam. A question from you.

Dr RATNAM: No problem. Thank you, Chair. I thought we actually had until 1.15 pm for this session; but anyway, it might be worth checking.

The CHAIR: No. I have got 12.45 pm on mine.

Dr RATNAM: Okay, great. No problem at all. Thank you so much, Dr McRae and Dr Foong, for your presentation and your submissions. I know you have been doing a lot of advocacy in this space for years, or your organisations have, so I really appreciate that. I actually want to ask quite a rudimentary question, given that we are at the start of these inquiry hearings and it is important in terms of us as non-medical doctors being informed about the subject matter that we want to investigate further. Dr Cumming started some of this questioning. I was wondering if you have time, or perhaps it is on notice if you do not have time to answer this fully, to talk us through how air pollution impacts our health. So particularly, Dr Foong, you talked about the kind of four main matters, the 2.5 and 10 particulate matter, nitrous dioxide and ozone being the four, I believe. Could you inform us about how those pollutants actually impact health? And particularly I was going to ask: what are the major factors contributing to asthma and how does air pollution impact pregnant women specifically?

Dr FOONG: Sure. Do I have time to share my screen? I have a whole kind of presentation on this.

Visual presentation.

Dr FOONG: What I can tell you is, I guess, the main things, as Dr McRae mentioned, are the pulmonary effects. So coarse particulate matter like PM10 can cause some changes in the upper airways, but particulate matter 2.5 goes further down into the lower airways. It can increase rates of pneumonia, and actually studies have shown that it can increase your susceptibility to COVID-19 infections. In terms of asthma, short-term exposure to particulate matter 2.5, ozone and nitrous dioxide were associated with a decrease in lung capacity—and obviously it also increases your risk of exacerbation of asthma—and long-term exposure to some of the pollutants in the air can cause a decrease in lung function. It can certainly cause exacerbation and also cause mortality from COPD, which is chronic obstructive pulmonary disease, and also it can cause lung cancer. The International Agency for Research on Cancer has classed the pollutants in the air related to particulate matter as a class 1 human carcinogen, and for each 10 micrograms per cubic metre increase in PM2.5 there is a relative risk increase for lung cancer of 1.09. And then there are also air pollution and cardiovascular diseases, so it causes changes in your blood, your blood vessels and the heart. It can cause an increased rate of death from myocardial infarction, or heart attack, and also increases presentations for heart failure and arrhythmias. In terms of strokes, it is also been shown to actually increase your risk of getting strokes, and interestingly new research has shown that it can increase your risk of dementia. Air pollution and maternal exposure, as I have mentioned before, has been linked to poor birth outcomes, such as lower birth weight children, stillbirth and spontaneous abortion, and early childhood exposure has been linked to effects on asthma, childhood leukaemia, obesity and attention disorder. Air pollution has also been linked to diabetes and renal disease. And the fact that we have also had an increase in heatwaves in Australia, that exacerbates air pollution as well.

So that is kind of a very quick run-through, but I can certainly send this presentation to the inquiry, if you think that it is—

Dr RATNAM: Absolutely. That would be helpful.

Dr FOONG: Because it has some journal articles of where it came from as well, you can have a source for that. Increasingly now we are realising that air pollution causes a lot of health impacts, and the particularly worrying ones would be the ones on children because they will become adults in 20 years, and if they start off poorly, then the health burden will be much higher in Australia.

Dr RATNAM: Thanks so much. I might ask some questions on notice as a follow-up, and particularly I was going to ask about where carbon dioxide fits into that frame. Because we talk about it in relation to climate change, I think there is less awareness about the air pollution quality of carbon dioxide. I was also going to ask, following up from the submissions, about transport emissions needing to be mitigated as a matter of urgency. And the other recommendation you had was the ACT buyback scheme for wood-smoke heaters. But as I said, I am just alerting you to those. I might write those questions up, and send them on notice, if that is okay, given the time.

Dr FOONG: Okay. That would be great. Yes.

Dr RATNAM: Thank you.

The CHAIR: Great. Thanks so much, Dr Foong and Dr McRae. And, yes, if you could provide the presentation that you have just run through for the committee for us to have a look at, that would be wonderful. With that, our time has expired for this session today. I would just like to thank you both, Dr McRae and Dr Foong, for your excellent presentation today. We appreciate very much you giving evidence and giving up your time to the inquiry.

Witnesses withdrew.