



# **Climate Health WA Inquiry**

## **Inquiry into the impacts of climate change on health in Western Australia**

**Inquiry Lead:  
Dr Tarun Weeramanthri**

**Witnesses:**

**Dr Richard Yin  
Chair, Doctors for the Environment Australia, WA**

**Dr George Crisp  
Committee Member, Doctors for the Environment Australia, WA**

**Thursday, 31 October 2019, 10.00 am**

**DEPARTMENT OF HEALTH**

**INQUIRY INTO THE IMPACTS OF CLIMATE CHANGE ON HEALTH  
IN WESTERN AUSTRALIA**

**(CLIMATE HEALTH WA INQUIRY)**

**INQUIRY LEAD:  
PROFESSOR TARUN WEERAMANTHRI**

**HEARING: DOCTORS FOR THE ENVIRONMENT AUSTRALIA, WA**

**WITNESSES:**

**DR RICHARD YIN  
CHAIR**

**DR GEORGE CRISP  
COMMITTEE MEMBER**

**THURSDAY, 31 OCTOBER 2019**

HEARING COMMENCED

5 PROF WEERAMANTHRI: I'd like to thank you both for your  
interest in the Inquiry and for your appearance at today's hearing. The purpose  
of this hearing is to assist me in gathering evidence for the Climate Health WA  
Inquiry into the impacts of climate change on health in Western Australia. My  
name is Tarun Weeramanthri and I've been appointed by the Chief Health  
Officer to undertake the Inquiry. Beside me is Dr Sarah Joyce, the Inquiry's  
10 Project Director. If everyone could please be aware that the use of mobile  
phones and other recording devices is not permitted in this room, so please  
make sure that your phone is on silent or switched off.

15 This hearing is a formal procedure convened under section 231 of the *Public  
Health Act 2016*. While you are not being asked to give your evidence under  
oath or affirmation, it is important you understand that there are penalties under  
the Act for knowingly providing a response or information that is false or  
misleading. This is a public hearing and a transcript of your evidence will be  
made for the public record. If you wish to make a confidential statement  
20 during today's proceedings, you should request that that part of your evidence  
be taken in private. You've previously been provided with the Inquiry's terms  
of reference and information on giving evidence to the Inquiry. Before we  
begin, do you have any questions about today's hearing?

25 DR RICHARD YIN: No.

DR GEORGE CRISP: No.

30 PROF WEERAMANTHRI: For the transcript, could I ask each of  
you to state your name and the capacity in which you are here today and when  
speaking through the hearing if you could briefly state your name for the  
purposes of the audio?

35 DR YIN: I'm Dr Richard Yin and I'm the WA  
Chair of Doctors for Environment Australia and also the Honorary Secretary.

DR CRISP: Dr George Crisp, I'm a member of  
Doctors for the Environment in Australia and on the State committee for WA.

40 PROF WEERAMANTHRI: Thank you. Sorry, can I just clarify  
because we've got your title there as DEA WA. Are you the chair of the WA  
Branch or the National?

45 DR YIN: I'm Chair of the WA Branch and the  
Honorary Secretary of the National Branch.

PROF WEERAMANTHRI: Thank you. Dr Crisp?

50 DR CRISP: I'm a member or a representative for  
Doctors for the Environment.

PROF WEERAMANTHRI: Thanks very much. Dr Yin, would you like to make a brief opening statement?

5 DR YIN: I think the only thing I'd like to highlight is the urgency of this issue in terms of climate change and the fact that each successive report that comes out shortens our timelines and suggests that the impacts are much more severe. And so it behoves on us as health advocates, and seeing this is a health issue, to actually strive to make significant changes  
10 in our emissions and actually protect health through taking the necessary measures to actually deal with this problem.

PROF WEERAMANTHRI: Thank you. If I could just remind everyone that the audio is in front of you. If you would just kind of project your voice so we get a clear recording, that would be great. Thank you for your very comprehensive and well referenced written submission and for taking the time to highlight issues relevant to Western Australia. We don't have time to cover all the issues you've raised in your written submission today and you make a number of recommendations as well, which we've read. But  
15 I'd like to focus on some points you make that are not covered by other submissions.

Firstly, can I ask you to highlight any environmental issues specific to Western Australia and broadly how they might impact health in this state.  
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DR CRISP: Yes. So there are a few things I could highlight here. I think that as elsewhere it really does primarily relate to that accelerating departure from normal climatic conditions in both temperature and precipitation and variability of climate. These can clearly directly affect health  
30 in terms of ambient temperature, air quality, and they can lead to more indirect complex and ecologically mediated impacts. These things are clearly relevant to Western Australia. The effects of ambient temperature are quite well documented. We've got data on health outcomes in relation to ranges of metrics including maximum mean temperatures and duration of temperatures and those health impacts and mortality increase non-linearly with increasing  
35 temperature and from quite a low threshold. We know far less about the actual individual components of that, so there's a gap.

WA is warming and drying. There's already recorded changes in both of those and it's quite foreseeable with increasing temperatures and drying that the health heat-related mortality and morbidity will increase as a result, and probably non-linearly. In IPC's fifth assessment report last year WA was predicted to have more over 40-degree days than any other state in Australia. We are predicted by CSIRO to have about a 500 per cent increase with no mitigation by the end of the century to over 20 days in Perth, and over the state  
40 between 130 and 190 million person days. So Western Australia is a particular issue with heat exposure. Obviously that could be mediated by a range of factors in terms of emissions trajectory and in the future, and also what  
45

adaptation measures, and better understanding of population and geographical risks which currently are lacking.

5 Similarly, there's a very likely increased risk from bush fires both of natural  
bush fires and also activity to manage them through proscribed burns which  
will increase the potential for direct injuries and for worsening air quality,  
particularly across the metropolitan areas, as the fire season is obviously  
lengthening and the conditions are generally worsening. We know that fires  
10 can be devastating and have protracted impacts on community health,  
documented both here with a fire in 2016 and in the eastern states. The mental  
health costs in particular run into billions of dollars. Related to that, in Victoria  
the intangible costs of the Victorian fires of 2009, for example, were estimated  
to be \$3.9 billion.

15 There's also a prospect of increasingly overlapping and compounding effects  
on physical and mental health with the increasing likelihood of heat waves and  
severity, and of bush fires and also of prolonged drought. This increases the  
likely incidence of these sort of compound effects occurring both  
20 simultaneously and consecutively for which there is very little research.

So in terms of indirect effects these are also very clearly in WA. We know that  
there are a variety of ecologically mediated effects that are possible and we  
know that WA's ecology is sensitive from a study in 2011 published in *Nature*.  
25 There were widespread and profound impacts across WA marine and terrestrial  
ecosystems with a 1 to 2 degree departure from normal in that year. We know  
that many of these things could then lead to sort of changes in the transmission  
of infectious diseases, human and livestock, affecting food production and  
quality and of course those consequent things.

30 However, those pathways are complex and really not currently quantifiable.  
So there's a great deal of uncertainty there and that, as my colleague Richard  
Yin has said, that there is also this concern really about the timing and the  
urgency of these issues. The longer we leave it or the more delay that we have,  
the more underprepared and ill-equipped we may be in terms of responding to  
35 health impacts. So we certainly are in favour of research into all of these areas  
through planning.

PROF WEERAMANTHRI: I might just pick up that issue about  
urgency but also needing to do research or generate new information and just  
40 ask you to think about whether... obviously there are impacts on health that  
have been described across the world. The question then becomes to what  
degree do you need to replicate those studies in Western Australia and/or  
balance that with a need to do research into the effectiveness of actions taken,  
for example, in the health sector. So given that what you've said about the  
45 time period ahead, where do you think the focus should be in terms of further  
work to understand either the health impacts of this state or the actions of the  
health sector. I'm genuinely not sure about that.

DR YIN: The health impacts are dependent on a whole number of things and if you look at climate sensitive risk and we look at just one indicator out of maybe 40, that is, if we look at something just like heat alone, this would give you some idea of what we would need to do to determine the health impacts. We would have to develop and implement a standard definition of “heat-related health outcomes” as well as standard methodologies for surveillance of outcomes and evaluations of adaptations, understanding risk factors for illness and death associated with both acute exposure to extreme heat events, and long term chronic exposure for which we don’t have very much information.

We’d have to quantify the combined effects of exposure to heat waves and ambient air pollution on excessive illness and death. We’d have to determine attributes of communities, including regional and seasonal differences, that are more resilient or vulnerable to adverse health impacts in heat waves; the health benefits of the use of environmental design to reduce high thermal mass for urban areas, for example; enhance ability of current climate models to capture the observed frequency in intensive heat waves across various time scales to support weather climate predictions and use of heat early warning systems in decision making; evaluating heat response plans, focusing on environmental risk factors, identification of high risk populations, effective communication strategies and rigorous methods for evaluating effectiveness on the local level.

Now, we’re talking about just one indicator and we’re not talking about how they compound when events occurred that are not just to do with heat but to do with drought, to do with bush fires, that might occur concurrently or at least in very close proximity to each other. The amount that we don’t know is just staggering and the sooner we begin this process the better, and certainly there are some teams that are operating out of Sydney trying to do some work and really it requires I think a collaborative approach across states and nationally to come to provide all the information that should be collated.

DR CRISP: And presumably could also be an area where say a health impact assessment or other process in terms of trying to determine more ‘what do we need to know and what research is missing’ as a starting point.

PROF WEERAMANTHRI: Thank you. Just to note that we will be making some broad recommendations in terms of these areas in Western Australia for further research and how that might be supported, but also there are national processes as you say, and the National Health & Medical Research Council are holding a workshop tomorrow in fact to look at their approach to supporting research into the environment and climate-related issues. So I think it is a good point to make about how we merge these things is an important design question.

In terms of going to that in an international context, you mention in your written submission the COP24 Special Report on Climate Change and Health

that was released by the World Health Organisation in 2018. Could you briefly outline the process that led to this report, its main findings and its significance for us in Western Australia?

5 DR YIN: The Special Report comes at the request of the then president of COP23, the Prime Minister Bainimarama of Fiji, to the World Health Organisation to prepare a report on climate change and health. The report is based on contributions from over 80 health professionals, academic experts, representatives of civil society in international agencies who  
10 have worked on climate change and health for over three decades. It's a long report and trying to summarise it within the time constraints of this hearing is not feasible, but here are some key points from the report.

15 With the sustainable development goals embedded into the agreement, the Paris Agreement is as much a health agreement and arguably the strongest health agreement undertaken globally. The health sector then should really be taking a lead role in advocacy. It outlines the strong linkages between climate change, air pollution and health, especially in developing countries. Air  
20 pollution kills over 7 million people annually and 90 per cent of the urban population of the world breathes air containing levels of outdoor air pollutants that exceed World Health Organisation's guidelines. In Australia that figure is around 3,000 premature deaths annually, which is still substantial and translates to eight deaths per day. And certainly reducing fuel combustion in transport energy generation in industry would reduce these numbers.

25 There's a special mention in the report of the need to reduce emissions for short-lived climate pollutants. These include black carbon, methane, tropospheric ozone and chlorinated gases. These are highly potent greenhouse gases. Methane in the short term, that is the 20-year period, has a global  
30 warming potential of up to 85 times that of carbon dioxide. Addressing these short-lived climate pollutants would make a significant difference to mean temperature rises by up to 0.6 of a degree mid-century.

35 I'd like to highlight methane. Australia's emissions of methane are rising as a result of our gas industry—both conventional and unconventional—and certainly that's the case in WA. We need to be doing our part in addressing this. This would require stricter emission guidelines from large emitters, not more lax guidelines, and we acknowledge climate change as a health issue then  
40 industries which emit high levels of methane should be subject to health regulation such as through a health impact assessment.

The report goes on to say then from an international perspective especially there are massive health gains from tackling climate change. Meeting the targets of the Paris Climate Agreement would be expected to save over a  
45 million lives a year from air pollution by 2050, according to the most recent assessments. The same analysis shows that the value of health gains would be approximately twice the cost of policies and the largest gains would be expected in China and India which would generate even a larger net benefit by

pursuing a 1.5 degree target rather than a 2 degree target. These health gains of meeting even a 2 degree target would also significantly offset the costs in other regions such as the EU and the United States.

5 The report then speaks of the need to address the health risks of climate change by building climate resilient health systems and they provide frameworks for doing that. And then the need to mobilise the health community for climate action and it notes that we are respected and trusted and are in direct contact with patients and directly witness and respond to the health impacts of  
10 environmental and air pollution and climate change. In the same way that the health profession raised public awareness about the health effects of smoking, they could engage the broader health community, civil society and the public in addressing climate change.

15 It then spoke of the need to ensure economic support for health and climate action. Of note is that often the benefits for health action against climate change are substantial and should therefore be included in cost benefit analysis of economic policy decisions.

20 I'd just like to highlight that fossil fuel combustion in Australia is likely to result in health costs estimated at between 11 to 24 billion annually. If this were factored into the costs of coal-fired power generation it would substantially change the true cost of electricity from such sources and change the comparative costs when measured against renewable energy.

25 The final point from the report was a need to be tracking the progress and impacts to health.

30 PROF WEERAMANTHRI: That's a very helpful summary, Dr Yin. Thank you for doing that. I was struck by the characterisation of the Paris Agreement as a health agreement and the implications that flow from that. Just for the record, we use the presentation or the graphics in this report in our presentation to the public around the links, the direct and indirect links, between climate change and health. We found this is helpful as a consensus  
35 understanding of those links.

The section on air pollution is interesting for the Inquiry because these are global figures. The challenge for the Inquiry is translated into what's relevant for Western Australia so that's a thread of our work; how relevant are those  
40 exposures, figures and analyses to illness and death from air pollution in Western Australia. That's something we're looking at specifically because we can't always just take the global figures and apply them here.

45 Do you have any help for us in terms of that taking something global and applying it? What does it mean for us here in WA particularly around air pollution?



DR YIN: Currently there's a review of the NEPM<sup>1</sup> standards on air pollutants, and DEA has made a submission to that Inquiry which is to vary the standards. Within that is a position statement that comes from DEA along with a number of other health organisations and I think including the RACP, the Lung Foundation, and that resource is available on our website.<sup>2</sup> It will detail some of the impacts of air pollution and some studies actually within Australia that highlight that even small changes in terms of air pollution standards would actually make a big difference to health.<sup>3</sup>

10 While it's more focused on oxides of nitrogen and sulphur dioxide and ozone, I think it's still relevant and it's worth looking into.

PROF WEERAMANTHRI: Great. In your submission there is a section on climate-related litigation which wasn't mentioned by many other people writing to the Inquiry. This seems to be a rapidly evolving area and recognising you aren't legal practitioners, could you give your view on whether and how the duties of directors or board members of public authority entities as often exist in the health sector, are similar to or differ from those of private sector directors.

20 DR YIN: I think the key paper I would probably refer to is from the Centre for Policy Development's discussion paper, "Public Authorities' Directors' Duties and Climate Change" that was published January of this year. The Centre for Policy Development is actually an independent policy institute in Australia and these were the key findings:

30 *Public authorities are important institutions for managing Australia's economy and are both potential contributors to climate change and subject to climate change with public authority directors likely have duties of care and diligence to consider climate risk in their activities which are at least as stringent as duties of private corporation directors.*

35 *Despite impediments to enforcement public sector directors are now increasingly likely to be closely scrutinised and held to account for climate risk management especially given the rising standards demanded of private corporations.*

40 I think the one sentence that summarises this, or one paragraph from that report states:

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<sup>1</sup> Dr Yin advised that NEPM is the National Environmental Pollution Measures. See: <http://www.nepc.gov.au/nepms/ambient-air-quality/proposed-variation/consultation-2019>

<sup>2</sup> Dr Yin provided the following website reference: <https://www.dea.org.au/wp-content/uploads/2019/09/Expert-Position-Statement-PDF-7.pdf>

<sup>3</sup> Dr Yin provided the following website reference: <https://www.ncbi.nlm.nih.gov/pubmed/30125857>

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5 *As in relation to private corporations, directors of public authorities will be duty bound to exercise due care and diligence in relation to foreseeable risk. As the Hutley/Hartford-Davis opinion has set out in relation to the Corporations Act, given the increasing accuracy of prediction models of the impacts of climate change to human societies, the physical and economic transition risk associated with climate change are reasonably foreseeable today and thus would fall within the scope of the director's duty of care and diligence.*

10 I think that's all that I can say.

15 PROF WEERAMANTHRI: We'll hear from all health services in Western Australia in this Inquiry, or government health services, and ask about ways to reduce emissions in hospitals. Already this morning we've heard about some exemplar initiatives from the Child and Adolescent Health Services. But just switching away from hospitals, what is the role of primary care in both mitigation and adaptation? And do you know of any organisations or practices in Western Australia that could be considered exemplars in this space?

20 DR YIN: I was wondering if I could the opportunity to speak to one exemplar potential case within a hospital setting. I would like to present some preliminary findings from a large public health service in Melbourne looking into power purchasing agreements for renewable energy. The service has an annual electricity bill of around \$5.5 million which is about half that of the Children's Hospital and Charles Gairdner site combined. It currently sources its electricity from brown coal through a process that is negotiated by the Victorian Health procurement. If it were to enter into a power purchasing agreement with a provider for renewable energy as opposed to brown coal, the cost savings that have been calculated over a 25 30 10-year period has been calculated around 9 per cent or \$5 million with a reduction in emissions and also other forms of air pollution through the avoidance of brown coal combustion and its health impacts.

35 While there are no doubt differences in calculations because of the different electricity generation costs between states and the discounted price agreements for large consumers, this should be a serious consideration and of a scale beyond just installed solar panels on rooftops of hospitals, and make a significant impact on the sector's emissions. If it was that we were to source all the renewable in... all our electricity within hospitals from renewables, I think the best guesstimate along with transferring fleets to electric vehicles the emissions reduction would be in the order of 10 per cent, you would have thought, roughly. I just put that out for consideration.

45 In regards to primary care, primary care contributes a small part to health care's carbon footprint, around 4 per cent. So in regards directly to mitigation its contribution would be small. But there are other things that could be considered.

DR CRISP: I think the place that general practice does fulfil is really the sort of messaging and health promotion. Most health promotion prevention happens in general practice and in doctors' waiting rooms and directly between patients. So there's an enormous opportunity for a general practice to be involved in education and health promotion activities. So the question really is: how could that happen and how could it be resourced and how could it be organised in terms of similarly to how other health campaigns have been carried out previously?

So the actual... in terms of reducing general practices footprint is limited, but it's really the flipside of that in terms of what could it do in terms of reducing... or raising awareness in the community and reducing the health impacts across the community and gaining some of those health benefits across the community too, co-benefits.

DR YIN: I think the other side is that supported primary care and an emphasis on prevention prevents unnecessary hospitalisation and the generated financial and energy costs because hospitals are energy intensive. Primary care is currently in the interface of our current health system for the initial diagnosis and management of a wide range of chronic diseases including obesity, type 2 diabetes and cardiovascular disease. There is evidence to suggest that a strong primary health care orientation within the health system is associated with reduce costs, increased efficiency, lower rates of potentially preventable hospitalisations and better population health outcomes. I think there's another direction where primary care has a part to play.

In the context of who's an exemplar practice, certainly within our practice we spend a lot of time thinking about how we reduce our emissions and while the impacts are small, they still are a step in the direction, but there are limits without structural change and support across the primary care sector about how we might do this better.

PROF WEERAMANTHRI: Just to respond a little, we will have the Australian Primary Health Association attending in a future hearing and we can ask them about some of those structural issues. Clearly, the sector isn't far advanced in this as a sector, and I don't think anyone is pretending otherwise. But the shift to prevention, as you said, is one of the biggest potential positive impacts on the environment if you could shift it from hospital to community care. The sense of responsibility I think is not governed by your percentage of emissions, so just as the health sector may be 4 to 7 per cent of all emissions, you could say "that's too small to make a difference, let everyone else do it". But if any one sector doesn't make the changes that are needed to burden those more on to other sectors, so everyone needs to play their part. So I think equally if primary care's 4 per cent of all the health sector emissions, primary care also needs to play its part even though it's 4 per cent because otherwise the burden becomes greater on everyone else.

5 We're just working through some of these issues but I think everybody needs to... every sector in health needs to look and see what they can do and support each other. But your points about having a supported structure as well are taken.

10 You mentioned in your submission DEA's own proposal for an Australian health care sustainability unit. I'm presuming that's a national body of some sort. Can you share any of the main elements of that proposal, how those elements might translate to a state body and how national and state units might work together in the future?

15 DR CRISP: I suppose the model here is the UK Sustainable Development Unit which is I suppose the primary example here and clearly we have quite a difference of model of health care in Australia in terms of the way that it's divided up. It would still essentially be aiming at the same sort of goals in terms of trying to improve that sort of triple bottom line, improving sustainability, environmental, financial and social things. But the inherent differences I suppose, you can still sort of envisage a broad set of priorities being involved in terms of consulting with health sector bodies, canvassing current and planned initiatives in relation to environmentally sustainable health care, developing the necessary metrics and benchmarks that could be used to monitor progress and improvements, and we outline some priorities in our proposal which are also on our website, such as developments and sustainability strategy for the health care including preventative health care, primary community care and hospital care, researching and developing innovations that would improve sustainability in health care, social-psychological research on behaviour, attitudes, policy research to clarify how design of health systems influences uptake of sustainable behaviour and innovation, and others.

25 The question in terms of how do you divide this up between state and national bodies, I think is probably beyond our immediate control obviously. It depends I suppose how this area evolves, if there is clearly a place for a state body because of the nature of a health service but that could be working in conjunction with or eventually being subsumed by a federal body.

35 A couple of other things about a sustainable development unit is that we know that health is really very wasteful and very inefficient at the moment. As I saw David Pencheon pointed out in his talk you wouldn't really invest in health on the basis of the way that it's structured as a business. There is clearly a lot of potential for improvements there. We know that.

40 For example, many of the treatments that we use are not supported by evidence. In the US, for example, about 50 per cent of their current treatments are estimated not to be supported by evidence and about 30 per cent of health care expenditure reflects care that is of uncertain value. One aspect of this would be to look towards comparative effectiveness research as a methodology

of looking at how do we better spend or apportion the resources in terms of getting value for money. But of course unnecessary treatments result in impacts and those impacts through their emissions and other waste means that that is potentially causing harm. That's something that is important from that perspective.

We'd certainly consider there's a requirement for structural change to our current treatment systems that I just mentioned in terms of general practice, the non-communicable diseases, the chronic diseases that actually take up a large proportion of management costs and pharmaceutical costs. In terms of prevention we allocate less than 2 per cent of our overall health budget. So there is a great sort of potential for changing care in that regard.

Another aspect that can be looked at through a sustainable development unit which is currently missing is that the health service is a very big industry. As such it has enormous... because procurements are such a big part of its emissions and waste, the purchasing power can be taken advantage of. Power... as a buyer, the health service could quite clearly change the market in terms of environmental outcomes in supply chains, and not just across the health service but much more broadly. I think there is great opportunity for the Australian health services as a group to impact environmental benefits across the community.

PROF WEERAMANTHRI: Dr Crisp, you raised this kind of big issue about anything that's unnecessary or duplicative or inefficient is actually, if you could reduce that you'd reduce the environmental impact. Some people might be not thinking environmentally but just in health services trying to do that kind of work whether it's on safety policy or good prescribing or something else. Have you thought about ways to engage the profession either directly through the environmental approach or indirectly through actually kind of reinforcing those bits of the system which would have a positive environmental impact even though you're not thinking about that?

DR CRISP: Partly, the whole idea around health sustainability is a centralisation or coordinating of that way of thinking and so that there's a repository of expertise within a group of people dedicated to actually thinking about that, because it makes it really hard when other areas of the health sector have to think about that as well or how are you going to coordinate all that. It almost requires one group thinking about how this can be effected across the whole sector, which is I think what the key thinking is behind—a dedicated unit.

PROF WEERAMANTHRI: We've got about 10 minutes left and I want to ask you to reflect on two things, please. One is your own experience in... I believe you share a practice or are part of a shared practice—in trying to become more environmentally friendly over time—because any lessons you have might actually go as well for the lessons for the hospitals because you don't want them, for example, trying to report on stuff which you've found is

impossible to report on because the definitions or methodologies aren't clear, would be an enormous waste of time for us as an Inquiry to recommend something that is inherently problematic and you might just be better off doing something else. So what are the challenges you've faced that we might learn from? But also broadly Doctors for the Environment has been around for a long time. In terms of how you act together at this point of time to make the most change possible because, frankly, even if there were to be a sustainable development unit or some sort set up in Western Australia, you can't put all the responsibility on that unit. How is that supposed to be structured, supported, interact in order for everyone to be able to make the change needed? It's a big question but you don't want to jump to a solution that says that unit will somehow fix a very complex health system. We've got to be realistic about this at every step. There's two questions in there for you.

15 DR YIN: If you look at the Sustainable Development Unit in the UK and how they've actually gone about the job, it's much more like before there were... there was some preparatory work on the metrics that were going to be used. So something was benchmarked that they could then successively see that was going to be lowered. Then there was given scope for each of the health services to do something. It didn't actually specify what they had to do. There was an idea that emissions reduction would have to occur, there was some scope, there was some framework as a way of thinking about the problem, modules, an idea around modules and how they could be implemented. The proposal could come from the health service as to what it was going to do, and then the metrics measured in some sort of way and some support doing that.

It's not really that the unit by itself just dictates what's going to happen; it's much more that it gave us a framework for thinking about issues like that that invites them, a health service, to come up with solutions and a way, through the benchmarking of metrics, to actually see reductions happening. So it's a more collaborative idea. And around that is also, I think what David's really keen on, is the idea that it's not as if we know how are we going, it's a clear idea as you go out with a clear vision for something and we believe that it's possible and we engage with people and culturally and sort of bring them along to see what can actually be done. I don't think it's necessarily that the repository of all solutions lies with this but there's a way of thinking that's actually important.

40 In terms of what occurs at our general practice and how it might translate to hospitals it's a little trickier because they're sort of different entities.

45 DR CRISP: But there have been... I mean, there have been lessons. I think one of them is that when we started our green practice initiative over 10 years ago, and things have changed incredibly that 10 years from when we initiated it in terms of awareness and many of the... not a lot of information around it.

Obviously, being a small entity we have very little power in terms of changing things. So we're very much at the mercy of lots of other organisations who want to deliver things in plastic and send us unnecessary things we have no control. As a big organisation, obviously you start to get much more control over things like that.

I think one of the other things that's been really interesting is how people respond to this. It opens up a dialogue in the community. It's been very visible and so there's clearly been engagements locally in terms of the things that we've done that it's enabled us to ask people and I suppose for people to comment as well. So some of the sustainability activities around our practice have drawn in a lot of the communities. I think you sort of find out as you go but I think there's clearly a lot of opportunity that's been missed in terms of engaging local communities with health services and providing information and highlighting synergies between some of these things in a local area.

DR YIN: In terms of making some direct actions and given the context of waste management and separation of waste which is a really key issue, I mean the cultural shift that's required even within our practice is really small. To make sure that waste is separated appropriately and everyone understands that waste separation has been enormously difficult. In terms of approaching something like that, especially in the hospital system where there's a whole chain that is required to manage waste from, let's say, within a theatre to where it ends up, there's a lot that needs to have to culturally shift and to make that easy for people that it's clearly articulated what needs to be done and processes that are in place that would support all that. Certainly, even now, we struggle. We struggle with waste separation and some clear guidelines about what constitutes infectious waste. I'm still not entirely clear which goes where if I happen to dab a bit of iodine on a bit of skin, is that tray? Where does the tray go? It becomes very complicated.

PROF WEERAMANTHRI: I think that's a big issue that's been raised a number of times. I don't think we're going to be able to, through the Inquiry, deal with it but I think we'll be able to recommend that a whole issue of the trade-off between infection control and single use be examined in a lot more detail, perhaps even nationally because it's bigger than just the state. But there's a lot of implicit assumptions that perhaps were justified some time ago which have kind of built in to historic practice now and people don't even know why they're doing it the way they're doing it and whether it's for convenience or infection control or for whatever, we'll need to rethink now.

DR YIN: I think also if hospitals were to be running on renewable energy it would change some of the metrics around comparing sterilising as opposed to buying disposable. So it would shift that cost benefits, it would shift a number of things around emissions in the calculation of what's more emission intensive, whether it's to actually sterilise or use packaged stuff. That would change the equation. So there's another reason for going down that line, in my mind.

PROF WEERAMANTHRI: We've just got a couple of minutes and before I close would you like to make any final statements?

5 DR YIN: Really, in the context of the research, it's just imperative in terms of getting more data that we are better resourced into entering this next decade or so and to the future that we start treating seriously what are potential health impacts because there's a recent article, a series of articles from the *New England Journal of Medicine* that clearly states that we're going to be uncovering a whole number of health impacts that we never even knew would occur. Take heat, for example, chronic kidney disease of unknown origin which is just emerging as a phenomena. It's a huge phenomena in terms of millions of people impacted. We know that heat plays a part in it and probably dehydration plays a part because there's also things that we don't know. It's likely that we'll uncover more illnesses that are actually heat related. So to go about, to make sure that we're ahead of the game rather than behind the game is really important. So the more money that we can spend in this area the more push that we can get for research I think the more important and the better prepared we'll be in addressing these health concerns.

PROF WEERAMANTHRI: Thank you both, Dr Yin and Dr Crisp, for your attendance at today's hearing. A transcript of this hearing will be sent to you so that you can correct minor factual errors before it is placed on the public record. If you could please return the transcript within 10 working days of the date of the covering letter or email, otherwise it will be deemed to be correct. While you cannot amend your evidence if you would like to explain particular points in more detail or present further information you can provide this as an addition to your submission to the Inquiry when you return the transcript, noting that you've provided us already with a very comprehensive and detailed submission.

Once again thank you very much for your evidence.

35 DR YIN: Thank you.

DR CRISP: Thank you.

40 HEARING CONCLUDED