REPORT ON PROCEEDINGS BEFORE

PORTFOLIO COMMITTEE NO. 2 - HEALTH

USE OF PRIMATES AND OTHER ANIMALS IN MEDICAL RESEARCH IN NEW SOUTH WALES

CORRECTED

At 814-815, Parliament House, Sydney, on Monday 16 May 2022

The Committee met at 9:30.

PRESENT

The Hon. Greg Donnelly (Chair)

The Hon. Lou Amato
Ms Abigail Boyd
The Hon. Wes Fang
The Hon. Emma Hurst (Deputy Chair)
The Hon. Chris Rath

PRESENT VIA VIDEOCONFERENCE

The Hon. Walt Secord

* Please note:
[inaudible] is used when audio words cannot be deciphered.
[audio malfunction] is used when words are lost due to a technical malfunction.
[disorder] is used when members or witnesses speak over one another.

CORRECTED

The CHAIR: Welcome to the first hearing of the Portfolio Committee No. 2 - Health inquiry into the use of primates and other animals for medical research in New South Wales. The inquiry is reviewing medical research being conducted using animals in New South Wales, including ethical and animal welfare issues; public health risks and benefits; the current regulatory regime; and public funding for this research. Before I commence, I acknowledge the Gadigal people of the Eora nation, who are the traditional custodians of the land on which we meet today. I pay respects to Elders past, present and emerging, and celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of New South Wales. I also acknowledge and pay my respects to any Aboriginals and Torres Strait Islanders who may be joining us today on the internet.

Today we will hear from a number of stakeholders, including medical research institutes, animal welfare organisations and private individuals. While we have many witnesses with us in person, some will be appearing via videoconference today. I thank everybody for making the time to give evidence to this important inquiry. I take this opportunity to update inquiry participants on the whereabouts of individual submissions to the inquiry. In addition to the organisational submissions already published on our website, we have received hundreds of short submissions from individuals. We are in the process of reviewing these for publication. They will become available online in the coming weeks.

Before we commence, I will make some brief comments about procedures for today's hearing. Today's hearing is being broadcast live via the Parliament's website. A transcript of today's hearing will be placed on the Committee's website when it becomes available. In accordance with the broadcasting guidelines, media representatives are reminded that they must take responsibility for what they publish about the Committee's proceedings. While parliamentary privilege applies to witnesses giving evidence today, it does not apply to what witnesses say outside of their evidence at the hearing. Therefore, I urge witnesses to be careful about comments they may make to the media or to others after they complete your evidence.

Committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. In that regard, it is important that witnesses focus on the issues raised by the inquiry terms of reference and avoid naming individuals unnecessarily. All witnesses have a right to procedural fairness according to the procedural fairness resolution adopted by the House in 2018. If witnesses are unable to answer a question today and want more time to respond, they can take a question on notice. Written answers to questions taken on notice are to be provided within 21 days. If witnesses wish to hand up documents, they should do so through the Committee staff.

In terms of audibility in the hearing today, I remind both Committee members and witnesses to speak into the microphones. As we have a number of witnesses in person and via videoconference, it may be helpful to identify who questions are being directed to and who is speaking. Finally, everyone should please turn their mobile phones to silent for the duration of the hearing.

CORRECTED

Professor ANTHONY CUNNINGHAM, AO FAHMS, NSW and ACT Branch Chair, Australian Academy of Health and Medical Sciences, before the Committee via videoconference, affirmed and examined

The CHAIR: Professor Cunningham, I invite you to make an opening statement, which will provide a basis to enable us to commence questioning. I just confirm, professor, that your submission was received and processed as submission number 223 to the inquiry and stands as such and has been uploaded to the Committee's webpage. We have all had the opportunity to review your submission. I pass to you to make an opening statement.

ANTHONY CUNNINGHAM: Thank you very much. Good morning. I would also like to acknowledge the traditional custodians of the land from where I am joining, which is the Cammeraygal clan of the Eora nation, and I pay my respects to Elders past and present. I thank the Committee for the opportunity to provide feedback to this inquiry into the use of primates and other animals in medical research in New South Wales. Very quickly, something about myself: I was the founding director of the Westmead Institute of Medical Research and stepped down in 2019, and am now director of the Centre for Virus Research there and the theme leader for the vaccines in the Sydney Institute of Infectious Diseases of the University of Sydney. I was director of research in the Western Sydney Local Health District for the first 14 years of my tenure as director of the institute.

But today I am speaking as State chair of the Australian Academy of Health and Medical Sciences, and this is one of Australia's learned academies with an impartial cross-sector voice of health and medical research in Australia. We are an independent, interdisciplinary body of 451 fellows who are the nation's leading experts in health and medicine. We cover expertise from more than 15 medical specialties—nursing, midwifery, allied health—and have some knowledge covering biomedical sciences, engineering, technology, social sciences and humanities. My personal expertise is infectious diseases, specifically vaccines, and I can speak to examples from this field. One hundred and thirty-five of our 451 fellows are based in New South Wales. The use of animals is crucial in many areas of health and medical research, with profound impacts on health in Australia and across the world. The cost and benefits of using animals in research in New South Wales are broadly the same as those that apply across Australia and internationally. Many advances in human and animal health have occurred because of the use of animals in research.

The development of COVID-19 vaccines and drugs provides an important recent example. The rapid development and rollout of drugs and vaccines would not have been possible without initial testing in animals to establish that they are safe and effective. The development of these vaccines is something that I have been involved in and so I can speak further on this as an example if that would be helpful for you. The use of animals for such purposes must be judicious and the handling of these animals must be humane. The academy supports and endorses the principles of the three Rs to refine, reduce and replace the use of animals in research. This principle is used in Australia and overseas to underpin the ethical, humane and responsible care and use of animals for research purposes. The academy supports the continued development of non-animal alternative methodologies, and I myself have been involved in some of these.

It should be noted that the current alternatives cannot fully replace animal research. The academy also supports transparent reporting of the use of animals in research. Research using animals is subject to strict regulations, which is important for researchers and for the wider community. Research institutions, animal ethics committees and individual researchers are bound to actively comply with the New South Wales Animal Research Act, the animal research regulation 1985, the Animal Research Regulation 2021 and the *Australian code for the care and use of animals for scientific purposes* of NHMRC. Those are introductory remarks and I am happy to provide some summary of the academy's submission, if you should want.

The CHAIR: Thank you, Professor. We will take you up on that offer.

The Hon. WALT SECORD: Mr Donnelly, can you hear me? I am operating remotely.

The CHAIR: We can, Walt, very clearly, thank you.

The Hon. WALT SECORD: Dr Cunningham, in your opening statement you mentioned COVID-19 and the use of animals. Can you explain what animals were used? You also mentioned safeguards. Could you explore that, please? That would be timely and interesting.

ANTHONY CUNNINGHAM: Initially, as with most vaccines, small animals are used for both toxicity and initial testing—such as mice. What we found with COVID-19 is that these animals do not provide an adequate model of the disease of COVID-19, and neither do ferrets that have been used in influenza research. It was Syrian hamsters that provided the best models of animal research. They had to be imported into Australia, because we did not have them here initially. Ultimately, also, all of the vaccines—that is mandated by the Food and Drug Administration, and the Therapeutic Goods Administration follows the FDA, according to their website and my discussions with them.

Eventually non-human primates were also used and have been very useful because they are so close to humans in demonstrating the responses that we require. So, safety, initially, and toxicity in small animals—the modelling of human disease in Syrian hamsters and non-human primates and, ultimately, getting as close to humans as we possibly can with non-human primates. They were very important, Mr Secord, because RNA vaccines were new; we had not had any used in humans previously.

The Hon. WALT SECORD: What would have happened if you were not able to test the COVID vaccines on animals? Would it have delayed—what would have been the practical result of that?

ANTHONY CUNNINGHAM: Certainly this would mean, in essence, that we would have no knowledge of potential toxicities or of the safety of these vaccines. It could have delayed COVID vaccines by years, because people would have been so cautious with using this completely new type of vaccine: RNA vaccines. Even the AstraZeneca vaccine had only been—this type of vaccine had only been used once before, for Ebola.

The Hon. WALT SECORD: In your opening statement you talked about safeguards. What were you referring to, and what do you mean by safeguards?

ANTHONY CUNNINGHAM: By safeguards I mean that animals need to be appropriately housed and looked after. Not only that, research needs to be regulated at arm's length. That is why we have animal ethics committees which are constituted by veterinarians and researchers and animal welfare people and laypeople in equal numbers. This is overseen by the Department of Primary Industries through its AARP, which is one of the program committees. There has to be transparent reporting of research and, also, all researchers have to justify the number of animals that they use. Over the years we see increasing stringency. In my own research we have been really quizzed on how we can reduce the number of animals while retaining the appropriate statistical significance in our research.

The Hon. WALT SECORD: How do New South Wales and Australia compare to other jurisdictions when it comes to safeguards on animal testing?

ANTHONY CUNNINGHAM: Very well. Victoria has similar processes, and many other jurisdictions also have such animal ethics committees. Animal ethics committees occur right throughout Australia, of course.

The Hon. WALT SECORD: Now, Dr Cunningham, I do not support the mistreatment of animals. But what would be the practical result on research—preventative health, vaccines—if, in fact, this Committee was to make recommendations tightening up regulations involving animal testing? Would the result be negative or positive? And what would be the practical result on your area of research and your members?

ANTHONY CUNNINGHAM: I think it depends on what you mean by tightening up. The regulations, over the years, have become tighter. It is incredibly important to have balance between the need for statistical significance and minimal numbers of animals being used. Also, we need to look for methods of replacement. Personally, I am trying to develop models from volunteers, using discarded tissues, to replace at least some animal research. But that has to be matched up with animal research and human results to make sure that we get the right results. If the regulations become too stringent, it would mean that New South Wales research would not be competitive with overseas research. And it probably means that less national research funding would flow into New South Wales and this would affect, undoubtedly, the quality of medicine and our hospitals. That is one of the reasons why research institutes are established, as I did, on medical campuses: to ensure that clinicians are well trained in research and therefore apply the principles of research to their practice of medicine.

The Hon. WALT SECORD: Dr Cunningham, do you feel that at the moment the balance is right in New South Wales?

ANTHONY CUNNINGHAM: Yes, I do. I think this is continuing. I think that we will continue to find substitutes for animal research but I am heartened by the fact that there has been a reduction in the number of animals over the years nationally and in New South Wales used in research and that indicates that we are making progress in looking for substitutive processes. I think we can look to other countries for some of the things that they do such as having centres for three Rs as occurs in the UK and perhaps this should be explored as a way of enhancing the networking of the jurisdictions across Australia. We sometimes can have unevenness between the various jurisdictions across the country and certainly I am a great advocate for networking as much as we can.

The Hon. WALT SECORD: If there was to be a recommendation to curb or draw back animal testing, what are the alternatives to animal testing? Excuse me if that is a very dumb question but if you were not able to test animals, what would you do? What would be the result of that?

ANTHONY CUNNINGHAM: I think that we would have to rely on results from other jurisdictions and internationally. It means that we would not be able to do things here. There is no substitute, as I mentioned—if you do not have hamsters you cannot work on drugs for COVID. There is just no way you can do that. There is

no other remedy of being able to predict the effect of drugs and vaccines on COVID without having those animal models. All the work would have to be done elsewhere, not in New South Wales.

The CHAIR: I have a little bit of time so, professor, perhaps I can ask some questions before our time has completed. Professor, in your submission you talk with respect to non-human primate studies and the need for the ongoing application of those studies to advance primary research and also specific pre-clinical trials, as I understand it—those two dimensions. Can you please, just for the purposes of the Committee, help explain matters to do with primary research or pure research versus that associated with pre-clinical trials?

ANTHONY CUNNINGHAM: I think that all of us—and this has been an increasing trend—are trying to translate our research from discovery into clinical outcomes. That means diagnostics, drugs and vaccines. I direct a national centre for HIV and hepatitis research where we are doing exactly that. Preferentially there is not a difference between the two. It is a continuum—a pipeline that goes through from discovery research on the bench, which you may do in cultured cells, which come from all over, right through to indeed research in animals which is the pre-monitor to going into humans. What we are trying to do is to reduce the impact on primate research. Primate research is expensive and also we prefer not to use primates if we can.

There have been advances in this area, for instance, using what are called humanised mice, putting human cells into particularly strains of mice that are immune-compromised. In fact, we were just recently talking about the use of drugs for a condition called HTLV-1, which affects people in Central Australia. About 45 per cent of Indigenous people there are infected by the HTLV-1 and there is no drug treatment. My colleagues in Melbourne are trying to develop drugs with these humanised mice models and it may be possible to go directly into humans without going into primates. That is what I think might be the future but we are not there yet. It is really important to emphasise we are not there yet. It is really important to emphasise that we would not have had COVID vaccines within a year if we had not had primate research.

The CHAIR: Could you please elaborate on the matter of the use of computing and computer technology—in particular, software—to model certain research that is being undertaken? I presume this is part of the continuum, professor, you spoke about—the application of computers, hardware and software, is utilised in research. Could you please provide insights into how that fits in?

ANTHONY CUNNINGHAM: I will give you an example from our own research. At present we are looking at all of these strains of the virus that causes COVID around the world. In fact, one amazing development has been the so-called GISAID database, into which scientists all around the world put their latest sequences, the genomic sequence of the COVID virus and so you can see how the virus evolves. This is a major problem for us at present, as you all know. We have already got two new strains circulating just recently in this community. In order to devise the best vaccines that might cover all of the COVID strains, we can use the computers to help us devise those vaccines. It does not help us in any way to actually test those vaccines out. It has to be done firstly in the test tube and then it has to be done in—and it could be done in humanised mice models to start off with but then it would need to progress into non-human primates before going into humans.

The CHAIR: Professor, is it your evidence that if research with respect to the work that you and others are doing in the field—I am talking about medical science—was not able to utilise animals—we are working without making distinction but putting them on a continuum if one talks about the mice at one end through to the non-human primates at the others, and you have identified some other animals. If there was not an ability to utilise them in medical research, would medical research be able to advance? It could not be undertaken in any other way?

ANTHONY CUNNINGHAM: True, you cannot replace—it would be simply a fantasy land to think that we could simulate all of the complexities of our primates and humans by computer. It is just simply not possible. One day, maybe, in 50 years that might be possible but certainly I would say that that is a long, long way off if people are thinking about computer simulations. I have never heard anybody realistically consider that in the scientific field. What I mentioned is certainly being brought about. How can you replace primates with smaller animal models? In fact, only about 0.3 per cent of animal research worldwide is carried out on primates.

The Hon. EMMA HURST: Thank you, professor, for joining us here today. In your submission you talked about the vast majority of animals being bred by the BioResources centre or the Animal Resources Centre. I am wondering if these facilities are also the facilities supplying cats and dogs for use for medical experimentation? Are you aware?

ANTHONY CUNNINGHAM: I am not aware, but certainly on our campus we have phased out any research using cats and dogs.

The Hon. EMMA HURST: Which facility is that?

ANTHONY CUNNINGHAM: Westmead.

The Hon. EMMA HURST: How long ago did you phase out the use of cats and dogs?

ANTHONY CUNNINGHAM: Look, I would need to take that on notice but it is over a decade.

The Hon. EMMA HURST: What was the reason for the phase-out of the use of cats and dogs at Westmead?

ANTHONY CUNNINGHAM: Companion animals, and we were able to use other substitutes.

The Hon. EMMA HURST: You mentioned that your work is specifically in vaccines, and I have spoken to other vaccine researchers. One concern that they had in regard to the legislation was a lack of flexibility in regard to the use of LD50 testing. One researcher that I spoke to had concerns that if they did an LD50 test and 51 of the animals died, they would actually have to scrap everything and start over again with new 100 animals. Do you have the same concerns with the legislation not being flexible? This was a facility that was actually testing vats of vaccine that were about to go out to the public market to test that each vat was a safe vaccine to actually put out into the market. Do you have the same concerns around the lack of flexibility for researchers around LD50 testing?

ANTHONY CUNNINGHAM: That is not something I do, so you would have to ask people who do that. What we do is to ensure that when we do our experiments we actually work out what is the power calculation for the minimum number of animals needed to provide a statistically significant result. If you do not do that, you are wasting the animals, which is incredibly important. You need to have the minimum number, and then you need to operate off that minimum number. I would imagine that LD50 testing would be a bit similar, but you need to ask an expert who is doing that.

The Hon. EMMA HURST: That is all right. I want to go back to breeding, and I think this relates to your recent answer as well. Some of the submissions that we have received talk about on-site breeding at facilities that is taking place beyond sourcing animals from those centres. The concern is that a large number of healthy animals are being killed because they are in excess of breeding stock. Have you heard of that occurring as well?

ANTHONY CUNNINGHAM: Certainly, on our campus that would be minimal. We try to ensure that that we match any breeding, which is usually with rats and mice, to the requirements of the experiments.

The Hon. EMMA HURST: Why are you doing on-site breeding if there are these two facilities open that are supplying animals?

ANTHONY CUNNINGHAM: Simply because we actually need things readily available. We are looking at, for instance, viral infection of nerve cells, and we need to be able to get those immediately. The reason we are doing this is we are trying to come up with new antivirals—for instance, for herpes, which underpins the acquisition of HIV around the world. It is necessary to do that locally. At Westmead—and I was director at the time—we actually ceded the breeding of most of our animals back to the Moss Vale facility, particularly as the director there had been the director of animal research at Westmead at one stage. It made more sense to do this. Breeding, of course, at any campus like Westmead is under the purview of the animal ethics committee and is inspected as such.

The Hon. EMMA HURST: You did say that there would be a minimal amount of overbreeding where healthy animals were overbred and killed. Would you be concerned to hear that at other facilities this could be an enormous number of animals—hundreds of animals, potentially, each year—that are being killed? Would that concern you?

ANTHONY CUNNINGHAM: Yes, it would. I would suggest that needs to be checked and oversighted by the animal ethics committee.

The Hon. EMMA HURST: You mentioned the three Rs in your submission and specifically around replacement. My understanding is that there is not a whole deal of funding towards alternatives to animals in research in Australia at the moment. In fact, one submission said there was no government funding to support and encourage replacement. Are you aware of any movement in this space? Does it make it difficult for researchers to actually do research in this space to develop alternatives while there are no actual funding avenues available?

ANTHONY CUNNINGHAM: The way we are doing this we are taking lymph nodes and tissues, discarded surgical tissues—

The Hon. EMMA HURST: Sorry, Professor Cunningham. To direct you back, the question was about funding for alternatives that are coming from either the Federal NHMRC or the State Government. Are you aware of any funding, and do you think that that would be useful to help develop alternatives?

ANTHONY CUNNINGHAM: I am just about to address that; you did not let me finish. What we are doing is looking at lymph nodes from human volunteers and also discarded surgical tissues. That is funded by both NHMRC—that is the surgical tissues—and the lymph node models are actually funded by global pharma, who are very interested to work out how their vaccines work in humans.

The Hon. EMMA HURST: So you feel that there is enough funding going into the development of alternatives currently? Obviously a lot of our submissions are talking about the lack of funding in this space to actually encourage the development of alternatives. You have given us one example where Westmead may be working on it, but my question was really quite specific about what funding is available. Is it enough, and do we need more funding to help researchers find those alternatives?

ANTHONY CUNNINGHAM: There is not enough funding for research in Australia as a whole. The funding success has dropped from 25 per cent to 9 per cent during my lifetime from NHMRC, and our younger researchers are struggling. All research is looked at competitively, and to deviate funding specifically to an area which may not necessarily be competitive would be inappropriate. It is most appropriate that all research is done competitively. There are certainly plenty of researchers around Australia I know that are looking at how one might actually use the sort of human models I mentioned, human tissue models, and winning competitive funds. I emphasise that all funding for medical research in Australia and success rates have declined, and it would be important to ensure any research funding for this was of the highest quality, meaning that it has to compete against other research as well.

Ms ABIGAIL BOYD: Good morning to you, Professor Cunningham. Closing out that discussion on funding, you mentioned that you were undertaking some research into alternatives. Is that research always funded externally? In your knowledge, do some of these institutions and other researchers put their own funds into trying to find alternatives?

ANTHONY CUNNINGHAM: I do not know where researchers would get their own funds from. Just about all medical research in this country is funded externally. It is NHMRC, ARC, Medical Research Future Fund, philanthropic or commercial. We have a mix of that in all of the research institutes and the universities.

Ms ABIGAIL BOYD: In terms of that commercial funding for research, what percentage of that would be into alternatives as opposed to other types of research?

ANTHONY CUNNINGHAM: I do not have a figure on that, but obviously there is an interest from global pharma in knowing how their vaccines and drugs work, so this may actually help in the future. This is one of the ways in which academia and pharma cooperate and collaborate. It is very important to have very clear understanding of the implications of commercial funding for research, of course.

Ms ABIGAIL BOYD: What is the incentive for big pharma to invest in research into alternatives to animals?

ANTHONY CUNNINGHAM: To improve their vaccines. To use my own research as an example—for instance, the one I am working on is a shingles vaccine, and also COVID vaccines—if we know how they work in, say, mice, mice may not necessarily be the exact equivalent of humans. One of the reasons why non-human primate research is carried out is because they are much closer to humans. If we can develop models that use human-discarded tissues, then obviously that provides a much greater understanding of how these vaccines might work in humans and how they might be improved—the side effects of them and their efficacy.

Ms ABIGAIL BOYD: From a commercial perspective, though, the only reason that you would invest in alternatives to research that involves animals, whether it be non-human primates or other animals, is because ultimately you are going to get a cost benefit from that. That would be correct? Be it through the process or something along those lines.

ANTHONY CUNNINGHAM: I could not completely generalise, but it would certainly make a lot of sense that commercial organisations would be looking to their own benefit for the future. Some commercial organisations, however, that have already made a lot of money through COVID vaccines are investing back into the scientific community because they recognise that much of the advances that have led to COVID vaccines have been produced in the public sector.

Ms ABIGAIL BOYD: If New South Wales was to tighten the regulations around the use of animals in medical research, would that then incentivise those big corporations to fund alternatives to animal use or do you think they would just go elsewhere?

ANTHONY CUNNINGHAM: They would go elsewhere.

Ms ABIGAIL BOYD: In terms of effectiveness, in your opening statement you talk about how primate research is vital for the COVID vaccine to be developed within one year. But there are a huge amount of experiments on animals that do not result in anything useful. How do we track the effectiveness of every particular bit of research and have an understanding of whether that use of animals was actually vital in that particular case?

ANTHONY CUNNINGHAM: I am often asked that sort of question in relation to all types of research. I think it is really important to understand that we do not know where the next advances are coming from. Medical research is like an upside down triangle. That means that many inputs are required to actually step forward—to get, as someone once said, "an extra sentence even in a textbook". You do not know where the next big breakthrough is going to come from. It might be Kary Mullis riding her motorcycle in California coming up with a brilliant idea. She came up with the PCR test that has been used so widely for COVID testing. The only thing we can do—and that is what we do—is look for the highest possible research in terms of excellence, and that means peer review and looking to ensure that that occurs. Unfortunately at this stage, as I mentioned, the cut-off is too high in Australia. If you take that triangle, we are moving too close to the tip of the triangle at present and we may be missing alternatives that may lead to the sort of advances that Peter Doherty made in discovering the fundamentals for organ transplantation, for instance.

Ms ABIGAIL BOYD: If there is no requirement to publish the results of research that has used animals when that research has not actually turned up anything positive, what is to stop that the same research then being repeated with another set of animals in future?

ANTHONY CUNNINGHAM: I think that is a very good question, and something that regulatory bodies and scientists have tried all over the world. One of the reasons why clinicaltrials.gov was set up was to ensure that all trials were registered and negative results were registered as well. Researchers like me often find ways to publish data that includes negative results as well, so you can publish the negative results side by side with the positive results. But I agree with you: It is very difficult to get journals to accept a pure negative study.

The Hon. LOU AMATO: Thank you, professor, for making yourself available for today's hearing. My colleagues have asked a lot of good questions and a lot of questions that I was going to ask. You mentioned in your submission Australia and the early stages of COVID-19, which you touched on earlier on. You stated that during the pandemic, "some research groups had to send their vaccine candidates overseas for animal testing because no appropriate small animals or nonhuman primates were available in Australia." Can you tell us why there were none available at that point?

ANTHONY CUNNINGHAM: Firstly, Syrian hamsters were not available in Australia simply because they had not been used previously. It has to do with breadth. Secondly, the primate research facility was actually closed down in Melbourne and taken in another direction, which a number of us thought was retrogressive and we are still trying to work on reactivating that.

The Hon. LOU AMATO: You mentioned earlier that the use of no animals in research may be another 50 years away.

ANTHONY CUNNINGHAM: I was commenting on the possibility that computer simulations might substitute for animal research. What I was trying to say is the complexity of humans and primates is such—and I am certainly not going to commit myself to just 50 years—that it is a long way off. That is what I was trying to say.

The Hon. LOU AMATO: One of my colleagues mentioned funding, and we know that there is never enough funding for any research and development. But even if you had unlimited funding, obviously it is still important at this point in history to have animals in research. That is my understanding. Would that be a fair assumption?

ANTHONY CUNNINGHAM: Absolutely. The comment I was making about funding is that Australia's research funding has dropped below those of our international competitors in Europe and the USA. I think it is up to all of us. Certainly when I was the president of the Association of Australian Medical Research Institutes, we pushed hard for the MRFF, but our younger scientists are having a lot of trouble when only one in 10 of their very extensive research applications succeed. That was my point. But that is apart from the fact that we have not nearly reached the point where we can eliminate all animals for research. We are trying to do that, and I mentioned my own efforts. In the meantime we need to stick to those principles of the three Rs.

The Hon. LOU AMATO: If they were to ban animals in research here in Australia and in New South Wales, then we would risk losing the intelligentsia of the medical research industry to overseas?

ANTHONY CUNNINGHAM: Definitely. We have a lot of people going overseas every year. I have a number of PhD students, who are very bright, overseas. We want to attract those brains back. It is particularly

important—as you can see, with New South Wales establishing an RNA manufacturing facility, a gene vector facility in New South Wales—that we get the best and brightest back into New South Wales because the excellence of our research supports this advanced manufacturing in the future.

The Hon. LOU AMATO: Your information here is also shared with colleagues overseas as well, and that is how you share information when you are doing research.

ANTHONY CUNNINGHAM: Absolutely. I used to travel overseas five times a year to go to conferences—often invited and paid for—and that exchange of ideas comes back to Australia and fuels our research, keeping us at the advancing edge so we can compete.

The Hon. LOU AMATO: You touched briefly on xenotransplantations. Will you tell us a little bit more about that?

ANTHONY CUNNINGHAM: I am sorry, could you repeat that? Just clarify the question for me.

The Hon. LOU AMATO: You mentioned xenotransplantation in your submission.

ANTHONY CUNNINGHAM: Yes, I am not an expert in xenotransplantation. But my colleague at Westmead Professor Wayne Hawthorne is now the president of the international xenotransplantation society, which is a real feather in Australia's cap. We have a very advanced transplantation capacity in the State—liver, lung, lately moving from the whole pancreas into just the pinhead islets to try to cure diabetes, which is what they have managed to do. The problem we have is there are inadequate numbers of human donors in Australia and around the world to satisfy the demand, and so there has been a lot of emphasis on using animals such as pigs, which have surprisingly quite similar immune systems and size of organs to us, and then engineering the pigs so that when we transplant the organs into humans they are not rejected. The first of these heart transplantations was done recently in the USA, so there is quite a lot of very ethical and careful experimentation on a particular strain of pigs at Westmead at present to look at how this might occur in the future and to try to catch the fallout from not having enough human donors in Australia.

The Hon. LOU AMATO: I have been following up on the advancements over many years. I was just reading about the pig one over in the US; I think it was a few months back that they brought us some information about it.

ANTHONY CUNNINGHAM: If I can just comment, that just shows how many years of research, both at Westmead and overseas, eventually finds its way into a human context.

The Hon. LOU AMATO: Yes, it took many years of dedicated research.

The Hon. CHRIS RATH: Thank you, Professor Cunningham, for your evidence so far. I want to ask a bit more about the difference in ethical considerations or the ethical threshold, which I assume is higher for using a primate for medical testing or medical research compared to other animals. What sort of difference exists in the regulatory regime or restrictions between using a primate and using a mouse, for instance?

ANTHONY CUNNINGHAM: I think Ms Hurst has actually visited Westmead to look at our primate facilities, so she will also be aware of how this occurs with the baboons. In essence, obviously I do not know all of the details. You would have to talk to Professor Hawthorne about this but, having looked at the facilities, you are absolutely right. They need to be housed in an environment that is stimulating. In our case it is TV sets—would you believe it?—and they need to have enough room. If you are dealing with large animals like sheep and pigs, they also need room to roam. It is important to give them paddocks and things like that. But for the exact details, I suggest you talk to people who are actually directly doing some of that primate research. But you are right that the requirements are greater, and they are looked at very carefully by the Animal Research Review Panel of the Department of Primary Industries and our animal ethics committee as well.

The Hon. CHRIS RATH: Is consideration given to how consequential the research is—for instance, research on medicine or drugs for chemotherapy against cancer at one extreme end, compared with drugs for hair growth or something that is quite minor at the other end? I think that if you said that animals are being used for medical research that is potentially groundbreaking cancer research, most people would probably say that is fair. But at the lower end, which is bordering on beauty and cosmetics, most people would say that is probably not fair.

ANTHONY CUNNINGHAM: Absolutely correct, and that is what has led to some of the concern about using colour cosmetics on rabbit eyes, as you would probably know. That is part of the brief of an animal ethics committee: to understand the consequences of the research. Is this highly valuable research? Is it well done? Is it excellent? Is it the sort of research that would justify using animals of any type? That is part of the brief of the animal ethics committees. They make those judgements, and they quiz the researchers very carefully about how the research is going to be used and the future significance. Yes, of course.

The Hon. CHRIS RATH: Do you think they are doing a good job overall?

ANTHONY CUNNINGHAM: Yes, I have experienced this in the stringency with which we have been quizzed over the past 20 years of my career. I can see just how carefully the animal ethics committee is now quizzing us, which is not surprising because they have got lay, animal welfare and veterinary representatives on those committees.

The Hon. WES FANG: Thank you, Professor, for appearing today and providing some insight into the invaluable world of medical research and the use of primates and other animals in that. I want to touch on one of the topics that Ms Boyd raised about cost-benefit analysis. Where in the cost-benefit analysis do you see the advantage to human life over animal life being factored in? Where an animal can be used in a testing facility in order to develop a vaccine that will improve human life, say, is that factored into that cost-benefit analysis? I worry that there is a view that human life is not higher than primate or animal life on the relative scale and that the research is not as important. Could you expand on that philosophical debate?

ANTHONY CUNNINGHAM: I think there are a couple of things. One is that I have read—and I am not an expert in this field—about the value of human life. I think it is very difficult to put a monetary value on that, and I would submit that it will vary greatly around the world and in various communities. I certainly know how expensive primates are, but I do not know the value of a primate life. I think the public has to be taken into account here—what does the public think of the price of human lives? Would we have been prepared for the COVID epidemic to have gone on for an extra two years, with all of the deaths involved—a million in the USA—without the development of vaccines? That is a very clear example of where there is a great benefit in animal research.

This is not an exact science, as far as I would understand. But I do not judge these things in economics; I judge them in terms of the significance of the problems we are trying to solve. As I said in my submission, 800,000 people are infected with hepatitis B and 37 million infected with HIV, and only 60 per cent of those people are on antiretrovirals. It is very clear as a medical researcher what our aims should be and what the significance of a successful outcome should be. I think it has to be taken in that sense. I do not think you can do this all on money.

The Hon. WES FANG: That was basically the point that I was trying to lead to. Cost-benefit analysis sometimes in relation to research to save human life is irrelevant. Is that correct?

ANTHONY CUNNINGHAM: I do not think I said that.

The Hon. WES FANG: No, I appreciate that. Would that be a fair assumption?

ANTHONY CUNNINGHAM: No. I think it is not possible to make exact comparisons the way that you are asking for, which is an economic analysis. Of course, health economics comes into everything. When the Australian Government is considering which vaccines it will put on the free list they actually ask all the time for a health economic analysis, and that can be done. That can be done because the cost of vaccines is known and the cost of certain diseases is known and then they can be prioritised and, in fact, that is how vaccines are actually brought into Australia and put on the free list. But trying to do that comparison for human life versus animal life—I have never seen such an analysis. I would be interested if you have such references.

The Hon. WES FANG: I do not. I think that was the point I was trying to achieve.

The CHAIR: Professor, that brings us to the conclusion of this session. On behalf of the Committee, thank you very much. I think there was one question that you took on notice and I expect there could be supplementary questions arising from members reading *Hansard* following the hearing. What usually happens in that case is that the secretariat will liaise with you over the provision of those respective questions and organise for your consideration and return within normally 21 days. If you would be agreeable to that it would be appreciated.

ANTHONY CUNNINGHAM: Yes. I think that was, "When were cats and dogs phased out of research at Westmead?" Which I should be able to find out fairly easily.

The CHAIR: We will extract the precise question from *Hansard*. On behalf of the Committee, thank you very much for your time this morning.

ANTHONY CUNNINGHAM: Thanks to the Committee.

(The witness withdrew.)

Ms RACHEL SMITH, Chief Executive Officer, Humane Research Australia, affirmed and examined

The CHAIR: Thank you very much for making yourself available today to this inquiry. I will now invite you to make an opening statement. Before you do so though, I acknowledge and thank you and the organisation for the submission. It has been received, processed and stands as submission number 204 to the inquiry. It is very detailed and I am sure that it will be the basis of a number of questions in addition to what you cover in your opening statement. So, please proceed.

RACHEL SMITH: Thank you for the opportunity to give evidence today and for your time and attention. Humane Research Australia [HRA] has submitted a comprehensive submission and I am happy to respond to any questions on this or in response to the submissions of other parties. Before doing so, I would like to reiterate the resistance that can be expected when the status quo is questioned. A culture of animal use is prevalent within academia, industry and regulatory agencies. This is despite animal models never having been scientifically validated, but simply accepted by default. It is of personal curiosity to me why this culture prevails. After all, we are talking about qualified, intelligent research professionals, inspired by the desire to help those suffering from life-threatening diseases. Why would they be prolonging the use of poorly performing animal models? A 2020 paper titled "Are researchers moving away from animal models as a result of poor clinical translation in the field of stroke?" provides some insight.

The publication is based on an analysis of 80 opinion papers. Most authors were from academic departments of neurology, neuroscience or stroke research. The majority sought to address the translation crisis by efforts to improve the reliable animal models. Only three papers proposed solutions that addressed the challenge presented by animal to human species differences, whereas most efforts were placed in trying to make animal models work despite the history of its failing. The paper discusses a theory that when confronted with anomalies within a paradigm, scientists tend not to renounce that paradigm but attempt to modify their theory instead. Beliefs and practices continue in the face of contradictory evidence, perpetuated by entrenched practices, institutional lock-in and supportive frameworks for animal research. These include a bias towards animal research by grant funders, peer reviewers and journal editors; the wish to avoid sunk costs invested in animal research infrastructure; and the economic drivers of those gaining from animal research, such as suppliers of animals or equipment.

Just as maintaining current scientific practices despite their inherent limitations is advocated by many, so is maintaining the current regulatory system, which is claimed to be world-leading and robust. Without public access to necessary documentation, it is difficult to disprove this claim. However, the research papers that HRA identify and the anonymous information we receive—which I can elaborate on—suggest the system of self-regulation is far from robust and that the cost-benefit analysis overestimates the likely benefits while underestimating the costs. HRA concedes that animal research has generated scientific knowledge. However, with the advancement of new approach methodologies [NAMs] and the inherent inability of animal models to accurately mimic human biology, we welcome this inquiry as a first step towards critical evaluation of animal research in New South Wales.

Whilst some may portray this debate as scientists versus activists, there is increasing recognition of the limitations of animal models in scientific literature and by innovative companies embracing new approaches. Many of the advocacy groups advocating for humane and scientifically valid research are staffed by scientists, many of whom previously used animals before coming to a realisation that they are impeding progress. Similarly, HRA has researcher representation on our staff and advisory committee. If science is about questioning ways of doing things to ensure we are best equipped to answer the questions that remain unanswered, then resistance to embracing a new paradigm must be overcome. For this change to happen it must be incentivised—for example via re-direction of funding or training in new methods—and there must be increased accountability to measure the progress along the way. I note this recommendation is shared by many of the other submissions, regardless of their position on the use of animals. HRA sincerely hopes this inquiry will lead to such changes in the interests of human and animal wellbeing.

The CHAIR: Thank you very much. That is a very poignant, clear and comprehensive opening statement.

RACHEL SMITH: Thank you.

The CHAIR: I am sure that will lead to a number of questions from Committee members. We have members of the Committee representing the Government, Opposition and crossbench. If you are agreeable we will rotate between the various groupings and questions will follow. Are you okay with that?

RACHEL SMITH: Yes, yes, of course.

The Hon. EMMA HURST: Thank you, Ms Smith, for coming in today and for all the work that you do. We have received a submission as part of this inquiry from an animal care staff member that actually works in a research facility saying that she has witnessed several welfare issues in the facilities that she has worked at including the killing of excess bred animals; cutting off the toes and tails of animals; killing off animals that are not providing the right data that the researcher wants; and incorrect use of analgesia. Does it surprise you to hear that this is potentially going on?

RACHEL SMITH: It does not surprise me to hear that it is going on. I was quite surprised to see a public submission because we receive very similar reports but they are usually anonymous or the people that provide the report are very cautious of the information being provided because they fear for their jobs or they sometimes actually have physical fear of their supervisors or co-workers. I was very pleased to read that because I think it is very brave of that individual to come forward and I look forward to hearing what they have to say, but it really echoes some of the information we have, which ranges from members of the public that served on animal ethics committees and felt they were completely intimidated. If they made a complaint about an animal research facility, they were no longer taken to view the actual facility. Similar to the person that made the submission to speak this afternoon, we have also heard about cases where animals were used and the data was not providing the results that the scientists wished to see so they simply instructed the animal care staff to euthanise those animals and restart the experiment to try and obtain the data they wish, which is obviously unethical and also creating invalid results. We have had anonymous complaints about research being conducted without an animal ethics committee approval. Probably the prominent one is harassment and bullying and fear of speaking out because of other members on the animal ethics committee or in the research institution. So it is not really a surprise to me but just a surprise that that person had the strength to speak out.

The Hon. EMMA HURST: Are there whistleblower protections in the Act that you aware of? We have got ADO coming later if that is not something you are aware of, but I am just wondering if that is another reason people are not coming forward.

RACHEL SMITH: I am not 100 per cent sure about the whistleblower protection but when we speak to anonymous providers of that information, they are fearful that they have signed confidentiality agreements as being part of the AEC or that if they were to share photos or footage, then that could be linked to them. So I assume that there is some obligation on them, at least while they are a current committee member, that they cannot share that information or that they cannot share footage or photos that they have obtained in the process of serving on that committee. But I am not 100 per cent sure about how the legislation—

The Hon. EMMA HURST: That is fine. I can ask another panel member that is coming later today. You mentioned that sometimes there is research conducted on animals without animal ethics committee approval. There was actually a case exposed recently in New South Wales where the animals were used in research without AEC approval with death as an end point.

RACHEL SMITH: Yes.

The Hon. EMMA HURST: How is this happening? Is it because there is a lack of transparency or a lack of oversight? How did we end up with a system where people are conducting experiments on animals with death as an end point without any ethics approval?

RACHEL SMITH: I think in that particular case there were a couple of factors that could be attributed. When there are multiple ethics committees being involved or multiple institutions or researchers being involved, sometimes there is an assumption that someone else has gone through that process. In that particular case, which involved a leading research institution, an anonymous source provided to me that that institution had known about that illegal research taking place for years before it was then reported, and when an individual made a complaint about that, a prominent person at that university just told them, "Sorry, get a life, I am not"—and carried on doing this. So I think that shows in a hierarchical system like a university sometimes the issues that are prevalent, unfortunately.

The Hon. WES FANG: Ms Hurst, could I just ask for some clarification?

The Hon. EMMA HURST: When it is your turn, because otherwise I lose my time. The lack of transparency is a huge frustration for you at HRA. Can you tell us some of the information that you would like to have available that you simply cannot access as a member of the public?

RACHEL SMITH: Yes. There is a great deal of information that we would like access, so we will try to think of a short list. The most important thing I think would be a list of licence holders in New South Wales because that information is being denied to us. It tends to be denied on grounds of public safety reasons. I do not necessarily think that is an adequate excuse. Also, we would like to see documentation on the funding that is being made available for animal research, new animal research and development of alternative methods. We would like

to see plain language summaries and the abstracts of the research that is being conducted, and retrospective assessments of that research. We would like the inspectorate reports to be made public and animal ethics committee deliberations to be made public, and clarity on the number of adverse incidents that have been reported and what the response was. We would like to be able to do an inspection of the Wallacia breeding facility. They are probably the top things that come to mind, just related to being able to assess whether that cost-benefit analysis is being conducted accurately or not.

The Hon. EMMA HURST: I might just go back very quickly to the anonymous information that you received about. It has been discussed at budget estimates. The name of the university has already been released by the DPI and I know that DPI was involved in that research as well. Is there anything else that you want to use this opportunity to put on the record about that particular incident that may have come across to Humane Research Australia?

RACHEL SMITH: Yes, actually when we have been trying to investigate further as to what penalties were put forward as a result of that, the information that we have seen released on behalf of the Minister is that they do not deem operating without animal ethics committee approval to be an offence under the Animal Research Act. I see it listed clearly as an offence in the Animal Research Act, so I am is quite surprised to see that the Minister's office is communicating that information.

The Hon. EMMA HURST: Do you have that in writing?

RACHEL SMITH: Yes.

The Hon. EMMA HURST: Are you able to provide that to the Committee?

RACHEL SMITH: Can do, yes.

The Hon. EMMA HURST: Thank you. That would be useful. Two of your focused campaigns are around forced swim test and smoking mice models. That is a big focus of yours. What is wrong with these experiments and what would you like to see this Committee make as a recommendation in regards to those experiments?

RACHEL SMITH: Yes. Again, we have had a focus on these because they are particularly invasive types of research. In relation to the forced swim test, there is growing evidence that it is not actually an accurate screening tool for antidepressants and many pharmaceuticals are no longer using that because of that lack of validity. Some institutions are no longer using that. The University of Adelaide and University of South Australia have recently announced that they are no longer using it. I think there is a growing consensus—I do not think we should have been using it in the first place—that this is not valid research and unnecessary as well as particularly cruel. In relation to research, I think exposing mice to smoke to try and induce conditions and then extrapolate findings from those mice is not necessarily going to be relevant to humans.

It is also very questionable and it involves prolonged exposure of the mice five times a week, and those with nose only exposure to a tube, to smoke when they can suffer a whole range of adverse reactions to that from death and suffocation trying to escape the tube. Again, we have released a report which documents a number of non-animal methods that could be used to conduct that research. It is not a regulator requirement to use animals in that basic research and it is very disappointing to see the University of Newcastle continue to use this method and for students to continue to be using that method there when, members of their own animal ethics committee—for many years, we have information that they have been objecting to that, but it is still continuing.

Ms ABIGAIL BOYD: Thank you very much. Good morning and thank you for your submission. I think there is a temptation by some to reduce the terms of this inquiry to being about whether or not we ban the use of animals in medical research, which, of course, is not what the terms of this inquiry are at all, but rather about the overuse and misuse of animals in research. Can you talk about how much of the research that uses animals turns out to be actually useful and necessary?

RACHEL SMITH: In terms of drug discovery, there are different numbers cited but it is approximately a 90 per cent failure rate after having used animals in preclinical trials. I think that is a pretty high failure rate. It is a bit harder to assess the basic research which is conducted at universities to understand mechanisms which may then lead to something else, but I did detail that a little bit in the submission about evaluating, for example, 20 years later how much of those breakthroughs that are reported in basic research have actually materialised to clinical use. Unfortunately that is also a very low translation rate.

I think it definitely merits an evaluation of: Could we be doing things different? Could we be investing funds in more reliable methods? Do we need to be relying on methods that we have used for decades that never have been scientifically validated but accepted by default? I think there is definitely a need for that stringent evaluation. As I said, because of the lack of transparency, we do not receive the grant evaluation reports and that

kind of nature of documents and we would really like to see those retrospective assessments in order to make that evaluation.

Ms ABIGAIL BOYD: Would it reduce the excess number of animals used in research if we were to require some form of publication transparency over the failed experiments using animals?

RACHEL SMITH: Yes, I think it would, and I think if there was that increased transparency and the knowledge that that information would be widely available, then perhaps it would be a deterrent to the type of research or excessive use. Sometimes we see PhD publications using thousands of mice, for example. Perhaps that would raise more questions at the animal ethics committees knowing that that information was going to be public and also making that information accessible so other researchers can see what animals were used, what the outcomes were and perhaps not leading to replication of any research if that information is publicly available in the scientific sector as well.

Ms ABIGAIL BOYD: When we look at the lack of funding for alternatives to using animals in research—I was asking the last witness about this as well—it appears that it is very unlikely that you will have a corporate funder, a big pharma type player, funding alternatives to animal research. We are really quite reliant on the government to do that, are we not?

RACHEL SMITH: I would say so. There is the Wellcome Trust, which is a pharmaceutical company. They have some specific grant rounds which are focused on new technologies, but it would not be the majority of their funding. But they have started to do that and there are some institutions that are introducing those. But we really need to see a government push for there to be sustained funding, particularly because government is the main source of the research funding in New South Wales, so I think it is the responsibility of the New South Wales Government to redirect some of that funding into non-animal methods. Otherwise we will not see necessarily that change in culture or the validation of new methods that are needed to inspire confidence in using those. I think internationally we are seeing that the government is contributing, or co-contributing at least, to the development of non-animal funds or alternative centres or centres of excellence. There definitely needs to be a government incentive, particularly in New South Wales I would say, as one of the leading States in terms of the number of animals used.

Ms ABIGAIL BOYD: In terms of—if you look back over the last 30 years—the decreased investment from government in medical research and the increasing role that big pharma plays, do you think that perhaps explains some of this inertia when it comes to changing the way that medical researchers do things?

RACHEL SMITH: I think in some degrees there may be some pharmaceutical companies where the regulations are such that it is easier for them to get results through using animals or they do not have to verify the non-animal methods or they can try on different species until it fits the results that they want. But there are other examples where pharmaceuticals are also pushing back. There has been a case in the US where a pharmaceutical company is suing the FDA because they do not want the drug that they have to try to be approved to have to have been tested on dogs, so they are pushing against that. There are other pharmaceutical companies pushing for changes in the US with the FDA Act. The statistics of the number of animals that pharmaceutical uses is also reducing, so I think there probably is a shift in pharmaceutical companies. Maybe the regulator is a little bit behind them.

Ms ABIGAIL BOYD: In terms of the transparency for the individual who is then using the results of the medical research, for example, if I was to try and choose between two types of medication, is there any way that I could find out which of those had used a more humane method and which might have used an alternative to animals or was used on fewer animals? Is there any transparency for consumers?

RACHEL SMITH: Not that I am aware of. For a therapeutic to be approved, it would have had to at this point have used animals, so it would be hard to distinguish between the two in terms of the degree of suffering or the number of animals or the species—that information. You probably could look back at some of their applications for approval and see the documentation that they submitted, but I do not think the average person would take the steps or know how to go about that. Some of it would be confidential anyway, so there is not really a scheme like you would see with cosmetics or other products at this stage.

Ms ABIGAIL BOYD: Do you think that if there was that level of transparency that might then encourage, for reputational reasons and for commercial reasons, the funding companies to actually do a bit better when it comes to using alternatives to animals?

RACHEL SMITH: Possibly, but I think really that kind of scheme or alternative methods really only have value if there is a change to the legislation where you can have methods that are not using animals to compare against. It may present a biased view, in fact, because you would see the medications that have been approved but you would not see all the failures. You would just see those products that have reached the end, which is actually

the vast minority. I do not really have a strong opinion either way, but I think it is probably not something necessary at this point.

The Hon. WALT SECORD: Ms Smith, I looked on your website and it actually says on your website that you oppose animal testing. What is the relationship between your title, Humane Research Australia, and claims on your website that you actually oppose animal testing? Do you oppose animal testing in all forms?

RACHEL SMITH: We do. We oppose animal testing. The "humane" is referring to humane research methods which are not using animals, so different technologies—

The Hon. WALT SECORD: [Disorder].

RACHEL SMITH: Yes.

The Hon. WALT SECORD: You oppose all animal testing. What do you say to Professor Tony Cunningham, who was on, who said that if we did not have ethical animal testing the vaccine that we currently have—and I can tell you this morning I have just been diagnosed with COVID-19 and I think the fact that I have been triple vaxxed means that in fact I am not suffering the ravages that people in developing countries are. What do you say to the fact that if we did not have animal testing on hamsters, ferrets and mice, we would be two years away from a COVID vaccine and millions of people would have died?

RACHEL SMITH: Yes, I did hear him make that statement and—

The Hon. WALT SECORD: Well what is your response to that?

RACHEL SMITH: My response is, well, really, it is a hypothetical situation because at the moment—

The Hon. WALT SECORD: No, it is not a hypothetical situation—

RACHEL SMITH: If you would let me finish, excuse me.

The Hon. EMMA HURST: Point of order—

RACHEL SMITH: As to whether we could have achieved that result without using animals because at the moment we have to use animals. But I think he has overlooked the fact that it was not just animals that got to the vaccine, it was also cell cultures, computer modelling, it was also non-animal methods that were used to assess batch quality of vaccines. It was also non-animal methods, for example, that were used to assess, using organoids, the impact on the brain.

The Hon. WALT SECORD: What? Sorry, I do not understand. What are you referring to?

RACHEL SMITH: I am just referring to the fact it was not simply animals that got us to the vaccine. There were non-animal methods which also contributed, not just to the development of the vaccine but to the batch testing of the vaccine, to looking at the impact of COVID on the brain using organoids, for example. I think it is quite simplistic to say that it is totally animals that got us to this point and we cannot say whether we could have achieved that result without animals because at this point, it is legally required to use animals so it is difficult to say whether we could have come to that point sooner or later because we are not at that point legally.

The Hon. WALT SECORD: You did not answer my question. What is your response to Professor Tony Cunningham saying that we would be two years away from a COVID vaccination if we did not have animal testing on mice, hamsters and ferrets?

RACHEL SMITH: My response is that that is inaccurate because we do not know the situation if we had not used animals and if we could have come to the same result using non-animal methods. That would be my response.

The Hon. WALT SECORD: What is your medical background? It says that you are Ms Rachel Smith. What medical training, research training or scientific training do you have?

RACHEL SMITH: I hold a masters in animal science.

The Hon. WALT SECORD: Animal science. Is it in the area of animal research? What is the area that you have in animal science?

RACHEL SMITH: In animal welfare science, ethics and law.

The Hon. WALT SECORD: Okay, so what is the area that you have that in? Can you be a bit more specific?

RACHEL SMITH: It is a masters, and the title is Masters in Animal Welfare Science, Ethics and Law.

The Hon. WALT SECORD: What did you do your masters dissertation on?

RACHEL SMITH: I did it on freedom of information legislation and animal research.

The Hon. WALT SECORD: Can we go back? You referred earlier to alternatives. What would be the alternative to testing on mice, ferrets and hamsters for COVID-19 vaccinations? What would be the alternatives that scientific research has picked up?

RACHEL SMITH: There is a range of different methods, from using human cells—it is quite complex for me to explain all the different methods—3D modelling, using computer modelling, using human data. There are different methods that can be used, like in-vitro vaccination development. I referred to several reports in my submission, and I am happy to provide further detail. It is difficult to explain all the different methods, but probably a combination of those different methods is what we would be advocating for.

The Hon. WALT SECORD: I think it is quite clear from your website and from your organisation that you prefer to have testing on human beings rather than on hamsters, mice and ferrets. Is that correct?

RACHEL SMITH: No, that is not correct. We are advocating for human-relevant biology, but it does not mean that we are advocating for testing on humans—or unwilling humans. It just means using human-relevant data. So, using human cells and then creating 3D models, or organoids from human-relevant material.

The Hon. WALT SECORD: You gave evidence earlier and talked about researchers cutting off the toes of animals and things like that. What is that referring to?

The Hon. EMMA HURST: Point of order: That was my evidence, not the witness's evidence.

The Hon. WALT SECORD: That was your evidence? I am sorry. Ultimately, I think I have got the general thrust of your evidence. When you say that there is a 90 per cent failure rate, what were you referring to? I take it from my notes, you said there was a 90 per cent failure rate in research.

RACHEL SMITH: So, in terms of drugs that have been tested in preclinical testing involving animals and then not passing through clinical trials to be approved, it is approximately 90 per cent.

The Hon. WALT SECORD: All right. But that is the accepted figure over as long as medicines have been around. You do have to test to get to a success rate that—in fact, a 90 per cent failure rate would actually mean a 10 per cent success rate. In fact, you have to go through rigorous testing regimes to get to a 10 per cent success rate. Is that correct?

RACHEL SMITH: Currently, yes. But I think if there are ways that we can expedite that, or—just because something has always been quite a high failure rate, I do not think that is a justification to continue that trend.

The Hon. WALT SECORD: I have sympathy for sentient creatures, but I just think that if you force me to make a decision amongst millions of people having COVID, two years away from a vaccine, I think that on balance I do feel that that is [inaudible].

RACHEL SMITH: As I said, it is hard to make an assessment without knowing if we could have achieved that same result without animals. I have the vaccine, and I am supportive of the vaccine. Unfortunately, I did not have a choice in selecting a vaccine that used animals or not. I think that we need to be investing more in non-animal methods so that we can respond quickly. When we are talking about COVID and a vaccine, a lot of the time spent afterwards was trying to establish which animals, then, could contract COVID—trying to genetically modify animals so that they can be receptive to COVID, so that we can then test on them—whereas, if we can spend time and money investing in non-animal methods which can be validated, then we can have them prepared if we do have another epidemic, rather than panicking and thinking, "What animal can we test it in? What animal can we try and recreate the symptoms in?" I think it is sometimes a bit more complex than we might first think from an emotive level.

The CHAIR: In regards to your answers to some of the questions that were provided earlier, you spoke about a matter of—not related to human biology. I am looking specifically in your submission—page number two, down the bottom of the page, and also on page number three. Page number three is probably clearest. The second paragraph states:

> However, HRA proposes that the benefits are overstated,—

and I presume you are talking about animal research here—

> and that superior methods based on human-biology are much needed to progress human health in the modern era.

Could you explain what you mean by that?

RACHEL SMITH: Sorry, I am just trying to find the—

The CHAIR: It is the top of page three, the first four paragraphs.

RACHEL SMITH: Yes.

The CHAIR: So, you are not disputing the knowledge has been secured from the animal research.

RACHEL SMITH: Yes. I think it is just trying to counteract the narrative that animal research has led to so many cures, but we are—if you are looking at that in isolation and not considering the times where it has also led to failures or adverse reactions, or has not resulted in the cures. Or, perhaps there has been a case where medication has been toxic in animals and then has not progressed. I think it is just a case of looking at a larger picture, than picking selective cases of where animal research has made a benefit.

Because of, I guess, the severity of diseases, I think that is in people's minds. If something is life-threatening, we have to do anything and everything to try and find a cure for that. But it is really looking at what is the best way to actually do that. That is what I think I am really referring to in terms of overstating. The ethical assessments are really looking sometimes, I think, at the severity of the disease and then justifying the research because of the severity of the disease, rather than the likelihood of that method really making a tangible difference.

The CHAIR: That is the claim that you make at the bottom of page two, the second last line: "The severity of a disease does not justify the use of animals". If that is not the case, what is the justification for using animals? What criteria need to be met to justify the use of animals?

RACHEL SMITH: I think, in terms of the severity, if the research was put forward and there was a clear justification that was the only method that could be used—and there has been evidence of results in that in previous cases no other method could be used—then there would be more justification of it, rather than, "We will keep implanting a tumour on mice and seeing if that will cure cancer", when we have cured it in the mice several hundreds of times probably.

The CHAIR: If we take the COVID example, which has been raised earlier, would you believe that is in the category of "severe", or a severity which would agitate the use of animal research—To confront and deal with something which has essentially come out of nowhere or, in fact, emerged very quickly, and a need to respond rapidly to deal with it?

RACHEL SMITH: I think the way I phrased it may be confusing, because it is not a case of saying that the severity of the disease does not merit a massive response in terms of research. It is just that I do not want the severity of the disease to automatically lead to the assumption that animals are the way to create a cure for that disease and there not to be thorough scrutiny on the methods used.

The CHAIR: If you take COVID, for example, as following that, if the animal testing—and I understand you are saying we cannot compare it because animal testing has been in place, but that is a circular argument. It just goes around in circles. We were confronted with the COVID-19 virus. Are you arguing that animal testing should not have been deployed in its various ways to deal with what was confronted?

RACHEL SMITH: Probably, at the level of sophistication and development we have in non-animal methods, it probably would have been too early a stage to have done that. But I do not think that means that we should not be—

The CHAIR: Sorry, what you mean by that?

RACHEL SMITH: Probably, because there has not been as much investment or development in animal methods, it may have been hard to have achieved the result in the time that we did without animals. But, at the same time, I think it should be remembered that with COVID a lot of the human trials progressed in parallel with the animal trials. It was not necessarily a case that the next stage in testing in animals was dependent on the results in animals. So, that is another point to consider as well.

The CHAIR: But it was essentially, as I understand it—your description of it, taken case to case—that there was a combination of animal and non-animal research work. Can I ask this question—I am just trying to reconcile the two. Do you believe that we were capable of getting to a point of not being able to use any animals at all, whatsoever, to conduct the medical research that drives what we do to try to enhance and improve a range of matters to help people's health, welfare and wellbeing?

RACHEL SMITH: I think we will. I think it may be at least a couple of decades off, but that is my ultimate aim and dream: that we get to that point. And we are seeing developments in pharmaceuticals in terms

of guidelines and acceptances and the recent attempts to make changes in the US so that non-animal methods can be used to validate drugs. So, I think we are getting to that stage.

The CHAIR: We are moving in that direction? Do you make any distinction between the use of animals—and I think I know your answer, but if you can just clarify this. Between the pure primary research that is undertaken—the pure scientific research to try to understand things better and, in an iterative fashion, build our knowledge, which is the way in which science builds over time, as you will be aware—and preclinical trials and the use of animals with respect to those, do you make a distinction between those two, in terms of—dare I say, in my words—a justification for the application of animal research?

RACHEL SMITH: Yes, I would make a distinction because I think in terms of the basic research, sometimes we see that that is more curiosity driven and sometimes it really just seems it is a case of trying to get publication after publication. I gave an example in the submission about the force feed—not force feeding, sorry—feeding rats lamingtons to evaluate the impact of a fast-food diet, which I think really is duplicating current knowledge about diet and health. I would make a distinction between some of that research, which I would say is to obtain a Phd or to maintain a career and some of the pre-clinical research. I would make that distinction, not in all cases but in some cases. Obviously legally the pre-clinical research at this stage has to use animals and the basic research does not. That is also a distinction in the way we might view those as well in terms of why we are using animals if we do not have to.

The Hon. CHRIS RATH: Ms Smith, I do not know if you heard Professor Cunningham, who basically gave some evidence about if we did not use animals for medical research here, then some of the research would go elsewhere, it would go offshore. What do you say in response to that?

RACHEL SMITH: Is he talking specifically about animal research? Is it his concern that that would impact on animal welfare or the quality of the research? I was not sure.

The Hon. CHRIS RATH: Another member asked a question about what would happen if you were not allowed to use animals for medical research and he made the observation that without that being available some of the scientists and medical research here in Australia would go elsewhere. It would go offshore to jurisdictions where that would be available.

RACHEL SMITH: Yes, I mean potentially that could happen. But another consideration is that there is an increasing global trend towards using other methods and developing other methods, as we see with the alternative centres elsewhere. It could be counter argued that if we are not embracing new methods of technology here, then our researchers could be going overseas to follow that path. That would be my response to that concern. If there is a concern about, for example, primate research being conducted overseas instead of Australia and what the impact could be on animal welfare, then I think it is a case of working with those countries to ensure that if we do have any partnerships with them or we do have any research contracted out that it meets the same requirements as here.

The Hon. CHRIS RATH: Have any jurisdictions banned medical research on animals?

RACHEL SMITH: There are phase-out plans. The US is working towards 2035 in chemical use. In The Netherlands they have a transition plan to phase out some types of research by 2025.

The Hon. WES FANG: Thank you for coming today and for providing some insights to the Committee. It is really valuable to have both sides of the argument presented to us. I want to follow on from questions asked by my colleagues. The first thing I want to tease out is an answer to the Hon. Walt Secord when you said that you are opposed to all animal testing. Is that across all spectrums? Are there circumstances where you support the use of animals in any regime of testing at all?

RACHEL SMITH: Probably to some degree in veterinary research—which is probably outside the terms of this inquiry. If it is veterinary research, which could be, for example, training vets in using certain methods using animals, so performing surgeries that they will be doing routinely inside of their training and they were supervised or it was working with a client and their pet was involved in a new trial of a product, we would not necessarily be opposed to that, or conservation research, environmental research that would not be detrimental on those animals. As I said, that is probably outside the terms of this inquiry.

The Hon. WES FANG: There are circumstances where you would accept that animal research is appropriate?

RACHEL SMITH: Yes, I think particularly, as I said, for veterinary research and not really having that same species different, so that is one of the reasons we would be in support of that.

The Hon. WES FANG: How do you establish a threshold for that, given that my interpretation of your original answer was that you were opposed to it. But I guess now we are going down the rabbit hole that there are circumstances where you might think that that is appropriate. How do you determine that threshold? What is the analysis of you and your organisation? How many members are in your organisation?

RACHEL SMITH: We have about 200 members and we have a broader database of about 6,000 people.

The Hon. WES FANG: How do you join your organisation? If somebody is watching this broadcast today and they like the aims of your organisation, how do they join?

RACHEL SMITH: They pay an annual membership and our committee approves all the members.

The Hon. WES FANG: The committee is made up of how many people?

RACHEL SMITH: Five.

The Hon. WES FANG: How do you get elected to the committee?

RACHEL SMITH: You stand for all members to vote for you. We have an election every year, for a minimum of two years and then we have a voting process.

The Hon. WES FANG: How much is the membership fee?

RACHEL SMITH: It is just going up to $33.

The Hon. WES FANG: There is your free ad. I will go back to my question I was asking. With the number of members that you have, do have a process where those members have input into policy positions that your organisation might take?

RACHEL SMITH: We have, I guess, a constitution and sign up in alignment with the constitution that we have. Our mission and vision is publicly available on the website for those members to determine. Our policies tend to be more organisational policies that we might develop in relation to compliance, for example, which the committee approved, rather than the members. But if we have a position at the AGM that is not a policy change, then we forward it at an AGM to be approved.

The Hon. WES FANG: Do you think the membership would be surprised to hear that you are open to a level of research using animals under the circumstances that you articulated earlier?

RACHEL SMITH: I am not suggesting that we are supportive. I am just putting forward the agreement of the position that we need to expand non-animal methods to the point where it is realistically going to be accepted by the research community and used in a time of disaster such as COVID. We are probably not at that point yet, but I think the members would be understanding of the limitations that currently exist. Some of our members work in animal research so they would be more than aware of those limitations.

The Hon. WES FANG: In the circumstance where there is, by your definition, an acceptable reason to need and implement animal research, how do you reconcile the needs of the primate or animal, the human race, the human body on which vaccine might be used and the organisation's, who perhaps might be able to monetarise some of that research later? How do you reconcile that with your group?

RACHEL SMITH: Can you rephrase that, sorry?

The Hon. WES FANG: In the circumstance where your organisation is primarily opposed to animal research, within your group how do you accept that there are thresholds for research that will benefit the human population and that that is acceptable and there are others that will not? For example, someone raised cosmetic surgery and the like earlier. I would imagine that that would be—

The Hon. EMMA HURST: Point of order: The member is putting words in the witness's mouth. She was quite clear about what she did say that she supported.

The Hon. WES FANG: I do not think I did that at all.

The CHAIR: Order! She did say she supported it, with respect to veterinary research. She clearly said that. But—

The Hon. WES FANG: That is what I am trying to tease out.

The Hon. LOU AMATO: There is no point of order.

The CHAIR: Perhaps put the question again.

The Hon. WES FANG: In the circumstance where, for example, cosmetic surgery might not be appropriate, on the other scale we have had a pandemic where it has been required. Where do you see that transition point?

RACHEL SMITH: I think probably for our members and myself there is always usually an inclination to be more opposed to those research practices that you would see as most unnecessary, like cosmetic surgery or the forced swim test or other methods. Our central positioning is that research would be more effective if we were not using animals, so we really have that across the board. It is not a case of we do not want the sort of research that is conducted into smoke-related illnesses because people should not smoke. It is not picking the issues that are most severe or most avoidable. It is looking at the most effective way of achieving medical progress across all areas, really.

The Hon. WES FANG: There is no doubt that this Committee and I expect medical professionals like yourself, we all grapple with that issue of what the line is. If there was research that was perhaps to save one human life or the potential to save one human life where there was a very rare diagnosis, that animal research and sacrificing animals in order to have an outcome that would save a human life would mean the death of one animal to save a human life, in that limited research circumstance or the pandemic where millions of lives are probably saved through the delivery of vaccines, where do you see that benefit to human life? How many human lives do you think are an appropriate number to have to save in order to endorse that research?

RACHEL SMITH: I do not think we have a set point of lives that we think are equivalent to animals. I think it is more considering the interests of all and trying to find the most effective research which cost the least lives in terms of animals and humans. It is whether we could in that same scenario try to find a human relevant research method that would have genuine chance of helping in that rare disorder. That is what we would be advocating for. I think the way you are looking at it is that it is either humans or animals, but that is not our philosophy.

The Hon. WES FANG: From that answer you just gave, can I take it that you would prefer that testing happen on humans over animals? Are you saying that a human testing regime is a substitute, perhaps, for animal testing?

RACHEL SMITH: We are not necessarily talking about going straight to human trials without prior testing. It is talking about human-derived cells or materials or epidemiological data and then using that human relevant research. It is not picking prisoners or picking a member of the community to test on. It is very different, human relevant research, to testing directly on humans.

The Hon. WES FANG: How effective is that research from those derived to, say, primate or other animal research? Does it correlate?

RACHEL SMITH: Yes. I actually have a recent example that I read which was looking at organ-on-a-chip technology. They looked at 27 drugs, 22 of which had previously been found to be toxic in humans, and that toxicity resulted in 208 patient fatalities and 10 liver transplants. That was after the drugs had been tested on lab animals. The organ-on-a-chip methodology identified 80 per cent of these drugs as toxic, and had this technology been used and available from the start, those drugs would not have made it to human trials and resulted in these fatalities. There are definitely concrete examples of where the non-animal methods are more accurate, actually.

The Hon. WES FANG: Can I take it that the fact that we have not implemented that across the board would mean that there is variability depending on what is it that we are testing and the results? Is it the fact that it is a more reliable method and there are other reasons we are still continuing this path?

RACHEL SMITH: I think a lot of it is down to the fact that it is still a new technology. People are still being trained in it. There are still validation processes that are in place with the organ-on-a-chip, but that is one of the technologies that the FDA has earmarked for validation first. So I think that is probably one of the ones that we will see used detecting effects of drugs.

The Hon. WES FANG: So potential in the future, but at the moment there is a lack of data to support that it provides reliable information, is that correct?

RACHEL SMITH: I do not know so much it is a lack of data but maybe a lack of acceptance by the regulatory agencies. It is still probably a couple of years off that point.

The Hon. WES FANG: Are you aware of any circumstances where those testing methods have failed or have not provided a strong result?

RACHEL SMITH: Where it has not correlated with the actual data, I am sure there would be some examples. I do not have them to hand. But they are new developing systems, so I have no doubt that they still have some way to go.

The Hon. WES FANG: Thank you. I appreciate the insights.

The CHAIR: Thanks, Ms Smith. That has been very helpful and enlightening, providing you with an opportunity to elucidate and expand on what was a very detailed submission, and we thank you for preparing that detailed submission.

RACHEL SMITH: Thank you.

The CHAIR: That brings us to a short break for morning tea.

RACHEL SMITH: Would I be able to table a document?

The CHAIR: Yes.

RACHEL SMITH: I wanted to table this document. It is from the United Kingdom, a report of the All Party Parliamentary Group for Human Relevant Science. I think it is the end result of a similar process to this, so I thought it might be useful to share. There is some useful information there about particular types of drugs and where we are at with those.

The CHAIR: We are grateful for that. We will process it. Thank you very much.

(The witness withdrew.)

(Short adjournment)

Professor ROBERT BRINK, Pillar Director in Translational Science, Garvan Institute of Medical Research, affirmed and examined

Professor PETER SCHOFIELD, AO, Board member, Association of Australian Medical Research Institutes, sworn and examined

Professor PHILIP O'CONNELL, Executive Director, the Westmead Institute for Medical Research, sworn and examined

The CHAIR: Thank you all very much for coming today. It is much appreciated by the Committee. I invite each of you to make an opening statement and after that we will open up for questions from the Committee.

ROBERT BRINK: I am Robert Brink from the Garvan Institute. I am the director of the Translational Science pillar and Garvan is the largest medical research institute in New South Wales, located down in Darlinghurst. I personally have had 30 years' experience in working with mouse models for medical research, with a particular expertise in immunology research and also in the generation and use of genetically modified mice in medical research. To summarise the major points of our submission, many of the major advances in medicine have been brought about through the use of animals in medical research and thereby have led to greater reductions in human suffering. For many purposes, there is no current alternative to the use of animal models basically because the complexity of living beings is such that we cannot model that computationally or outside the living being. We believe that, for the time being—and as far as we can see—animal models will be essential for advancing medical research.

Animal experimentation is very highly regulated and overseen independently by the animal ethics committees, which run through the various research institutes. It is very clear that only research which absolutely requires animals is approved by these ethics committees and research cannot take place without their approval. I would also say that animal experimentation activity brings quite a strong economic benefit through the employment of people who are working in the care and maintenance of animal colonies, but also through the research jobs involved. I would underline that Garvan actually established, about 10 years ago, Australian BioResources on an old farm down near Moss Vale. It is a significant local employer down there and a significant part of the colony there. It is state of the art in terms of animal care.

PETER SCHOFIELD: Thank you for the opportunity to be here and to answer your questions. AAMRI, the Association of Australian Medical Research Institutes, is the peak body with 58 members nationally and 20 in New South Wales. Our members undertake collectively—and you have three of us here today—about 40 per cent of all government-funded medical research, comprising nearly 20,000 staff and $2 billion on research expenditure across the whole gamut of activity. The MRIs in New South Wales are global leaders in their field and are responsible for advancing medical research that both saves lives and reduces disease burden.

In the AAMRI submission we make three recommendations to this Committee and thus to the New South Wales Government: Work with stakeholders to develop accredited training standards and training programs for staff working with animals in research; fund initiatives that can help develop alternate methodologies to replace, refine and reduce the number of animals used in medical research; and work through the COAG process to establish a national centre for the replacement, refinement and reduction of animals in research. I would like to address some misconceptions that I have heard or seen in other submissions. We do not consider we are at the point where we can replace animals with alternates at this stage. There have been advances, there are alternative methodologies in some areas and they do present opportunities to reduce the number of animals used, but this will take time and will take investment. This was acknowledged by the previous witness.

Those opposed to the use of animals in medical research point out—as did the last witness—the large number of pre-clinical trials using animals that did not lead to a new medicine, and they present this failing as an unnecessary use of animals. This is far from the case. Most drugs developed fail to reach the market. Animal testing is just but one portion in that process. The pharmaceutical industry wishes they had a better pathway to get new medicines effectively to the community. Pre-clinical trials are just one of those stages in the continuum from research to the new medicine or treatment. Without testing in animals for safety and efficacy, it is impossible to take that next step. Without animal testing, the failure rate in clinical trials would be much higher and far more dangerous for humans because we would then be making humans the guinea pigs.

The benefits gained from the use of animals in research have not been overstated, as some submissions contend. The progress that we have made in developing new knowledge, medicines and treatments would not exist without the careful and considerate use of animals in research. If there were effective non-animal alternatives—and as I have said, there are many already—medical researchers would use them. Using animals in research is very expensive, very time consuming and only undertaken to improve the knowledge and the human

condition. Finally, we are in strong agreement with the submissions from many organisations on the need for further investment in the three Rs, and we think that Australia should have an integrated national approach to this. Jurisdictionally, we have to work together.

PHILIP O'CONNELL: Apart from the Westmead Institute, I am also representing a large number of medical researchers on the Westmead Health and Innovation Precinct, which is probably the largest health precinct in the Southern Hemisphere. In making our submission, we wish to emphasise the importance of animal research in improving patient outcomes for a broad range of diseases. Medical research should be viewed as a continuum from dry laboratory computer modelling through to clinical trials. Animal research is an essential component of this continuum that cannot be excised from other research activities. Without animal research, our understanding of disease would be severely diminished, the introduction of new therapies severely curtailed and an unreasonable burden and risk will be placed on vulnerable people who will either have their medical needs unmet or face an increased risk when new, inadequately tested therapies are put forward for clinical trials without thorough evaluation.

New South Wales has a strong regulatory regime to ensure the protection and welfare of all animals used for research. In the case of non-human primates, there are additional layers of oversight and regulation, as is appropriate and was outlined in our submission. We believe that the current regulatory framework is comprehensive and rigorous within a mandated good governance framework and does not need to be changed. It is our opinion that further additional regulation will adversely impact productivity and cost without any improvement in animal welfare.

In the case of non-human primates, we agree that institutions and ethics committees must ensure that the work is necessary, beneficial and humane. However, due to their relative similarity in behaviour and biology to humans, there will always be a role for non-human primates in research. Many small molecules or drugs that are designed for humans are inactive in rodents, hence non-human primates play a small but important role in translating discoveries in lower order animals into therapies in humans. Their similarities to humans in terms of receptor-ligand compatibility and development means that they have a special place in neuroscience research, immunology, vaccine development, pregnancy and gene therapy. For all these diseases, there are examples of non-human primate research yielding results that translated successfully into better patient care.

Equally important are examples where therapies have not progressed to human trials due to failure in non-human primate testing, thereby sparing humans from the futility and risks of what would be a failed therapy. By its nature, this research is complex, requires a large multidisciplinary team and is expensive. As a developed nation with a comprehensive and high-quality research infrastructure, we have the capacity to undertake this research in areas that are aligned with our national research priorities and in a way that ensures the animals are adequately cared for. It is better that this research is undertaken in a regulated environment such as in Australia, because stopping it here will only mean it is taken offshore to less regulated jurisdictions, with a resultant decrease in the welfare of animals.

Another important consequence of further restricting the use of animals for research is the impact this would have on the State's ability to benefit from the large global investment in biomedical technology. The New South Wales State Government has earmarked Westmead as a lighthouse precinct for biomedical commercialisation and investment, and it is expected to create more than 50,000 well-paid knowledge jobs in western Sydney based around the Westmead Health and Innovation District. If access to the appropriate use of animals for research is unreasonably curtailed or impeded, then many world-class research groups in our institution would cease to exist. There would be a brain drain to other States and overseas. In the long term, this will lead to higher healthcare costs and an inability to develop appropriate responses to Australia's health priorities.

The recent events around COVID-19 have been a classic example. The outstanding outcome in our State and nation was in large part due to our long-established research expertise in viral and vaccine research. The development of RNA vaccines was very much dependent on animal research that occurred over several decades. The next epidemic may not be global, it may be regional, and weakening our research infrastructure will severely inhibit our ability to urgently address these future health challenges.

The CHAIR: Those opening statements set the scene very nicely. You are probably aware, but I should confirm anyway, that your submissions have been received by the Committee secretariat and processed. The Association of Australian Medical Research Institutes' submission is No. 226. That has been processed and stands as a submission to the inquiry, and it is on the inquiry's webpage. The Garvan's submission stands as submission No. 219. It has been processed and stands on the webpage for the inquiry. The Westmead Institute for Medical Research's submission has been processed and stands as submission No. 209 to the inquiry. They have all been received, and thank you for the information contained within them.

The Hon. EMMA HURST: Welcome. I want to start with a question to Professor Brink. Your submission says that the Government is falling behind other countries when it comes to supporting and funding alternatives to animal research. Why do you say that? What countries should we be looking at? What models are happening as best practice overseas for those alternatives?

ROBERT BRINK: Could you just tell me where that is in the—

The Hon. EMMA HURST: Sorry, I do not have your submission with me. While you are looking for that, I might move to Professor Schofield. I noticed you were nodding along as I asked that question, because you also mentioned it in your submission. You said that the Government should be funding more alternatives to animal research and that we should have a centre for alternatives. Can you describe for us what they would look like and what we need?

PETER SCHOFIELD: Other jurisdictions have introduced such centres—the UK, the Netherlands and I think Switzerland as well. There are a number of countries that are exploring these issues. One of the challenges and perhaps the issue of also dealing with community expectation is that setting up some such centre needs to be able to move the whole dial, not just do the work in isolation. There needs to be acceptance as to what is a new, approved alternative model if we are to replace an existing arrangement. That will take time, effort, diligence and statistical analysis of whatever is proposed. There will be differences in each particular circumstance in what the purpose of animals was previously and what is proposed.

As an example, it was stated by the previous witness that brain organoids could replace testing in animals. Stem cell technology has still got a long way to go. There are some areas where it has made major advances, and there are a lot where there is still promise—potential, but not fulfilled delivery. Organoids are one aspect of stem cell science where you use the stem cell to generate something in a culture that mimics the organ—a kidney, a brain et cetera. It is not a kidney and it is not a brain, but it gets closer to it. It gives the opportunity for doing a number of preclinical tests. Establishing a standard methodology that would be accepted by regulators would be an important way of reducing animal usage numbers in that drug testing regime. But it is about getting a standard approach and something that everybody can agree on, rather than one individual saying, "Oh, I've got an idea out here", or "Oh, I've got an idea out there." I do not think that will help.

The Hon. EMMA HURST: From what you are saying, it sounds like some of those alternatives need a lot more work done on them. I am guessing that that is why you are suggesting we need that government funding and we need that centre for alternatives—so that there is a solidified base so that we can make sure that the alternatives that will replace animals are well supported across the field. If we were to do that, do you believe that that would eventually, at some point, help us significantly reduce the number of animals in research?

PETER SCHOFIELD: I do, and part of what we have seen in the reporting data from the Animal Research Review Panel is the number of animals used in research. I am not sure why they all went up until about 2010, but they have certainly been coming down across the domain. As I said in my opening comment, use of animals is very expensive and very time-consuming. Although others have suggested that researchers are vested in that space and therefore just want to keep on doing it, I do not think that is the position at all. Researchers have reached that position because they think that is the best way of gaining knowledge or the best way of developing a new therapy. It is the regulatory role of the panel and the ethics committees to actually test those assumptions to make sure that any particular proposal is valid and has legitimate reasons and to define how they—the researchers—have considered reduction, refinement, replacement in the development of their proposition. The more that something is developed that is a standard that everybody can agree on, the easier it would be to achieve that goal.

The Hon. EMMA HURST: Professor Brink?

ROBERT BRINK: Peter has covered it really nicely. I do not really have much more to add. There was a suggestion of the DPI seminars—which were discontinued five years ago—which our animal ethics person was very bullish about them and thought they were a great idea, but they were discontinued due to funding. I think that was his principal issue there. I think in relation to the animal usage going up to 2010, I think that is really reflective of research funding, to be honest. Animal experimentation is very expensive and is actually more expensive now because the way the animals are cared for is much better than it ever has been. People only ever do it if they really have to, because you are trying to make your research budget stretch and doing animal research is not the way to do it.

The Hon. EMMA HURST: Professor Schofield, your submission talks about the small number of animals that are imported for research. At 5.4 you mention mice and rats and occasionally primates. Are you aware of any dogs or cats being imported? I know that there is a dog breeding facility for medical research in New Zealand. Are we importing those animals as well, or is it limited to the mice, rats and primates?

PETER SCHOFIELD: To the best of my knowledge we do not. I checked with our executive officer, who assisted in the preparation and principal drafting of this submission. I think that question was asked of Tony Cunningham earlier. And ABR [Australian BioResources] and ARC [Animal Resource Centre] in Perth do not provide dogs or cats, and I do not believe any are imported.

PHILIP O'CONNELL: Correct me if I am wrong. Related to that point, I thought when the law changed in the late 1990s dogs and cats were no longer used in medical research.

The Hon. EMMA HURST: No, that is not correct. It is just that they are not allowed to be sourced from pounds.

PETER SCHOFIELD: That is right.

PHILIP O'CONNELL: Okay.

The Hon. EMMA HURST: That was that legal change. What I have heard rumours of is that a lot of dogs and cats that are being used in medical experimentation are being sourced online through websites like Gumtree where people put up an animal "free to good home", and that is the primary way that people are getting animals. So if the breeding facilities are not providing them, if they are not getting them from pounds and if they are not being imported, do you think that there is perhaps some truth in the fact that people could be actually getting these animals from Gumtree?

PETER SCHOFIELD: I do not have any evidence to speak to that. But I guess I turn around and say, this is a question that you should direct to the animal research panel, who have the oversight of the legislation and receive the reports from the respective animal ethics committees. I do not think that most people would find that to be a particularly good way of getting—if you are going to get probably diseased or end-of-life animals et cetera. If that was the case I would not have thought that would have been supported by the animal research panel or ethics committees.

The Hon. EMMA HURST: So you would be quite concerned if that was proven to be correct?

PETER SCHOFIELD: Correct.

The Hon. EMMA HURST: You also talk in your submission at 7.3 about the rigorous process to get money from the NHMRC, which is obviously a Federal funding body. We know that there is State funding as well being provided within New South Wales and I wanted to try to get some more information about the process of getting money from the State Government. Is it as rigorous as that NHMRC funding? And what is the process? How do people access this money for animal research?

PETER SCHOFIELD: Increasingly NHMRC have a very well-tested—I think we have all lived under—system of peer review, independent peer review and panels and so forth. State—the Office for Health and Medical Research, for example—is increasingly under the scrutiny of Treasury for value for money for the taxpayer and have been continually upgrading the independent panels and assessments of applications. I cannot speak to whether that is the case for every piece of State funding, but certainly the Office for Health and Medical Research is very substantively relying on independent assessment panels in the same way that the NHMRC does.

The Hon. EMMA HURST: So the peer review and the independent peer review process that happens with the NHMRC is happening in New South Wales?

PETER SCHOFIELD: Correct.

The Hon. EMMA HURST: How do universities get money, say, for honour students doing medical research on animals? I am assuming that is not coming from these much more rigorous processes.

PETER SCHOFIELD: Look, I will let my colleagues offer some other observations. But the Federal Government funds universities for the education component; that includes honours students. That does not include any of the research project costs. They are met by the academic or the supervisor. Each of us are supervisors in our university appointments and have variously hosted honours students, as well as postgraduate students. So if we had an honour student doing animal-based research, we would need to fund that out of our own research grants or out of our own institutional funds. I will look to my colleagues to see if they want to correct me in any way.

PHILIP O'CONNELL: The way it would work—or my personal experience is that normally you have a large research group to which an honour student comes in and you give them a defined project, which they only have nine months to do. Normally, if it is animal-related research, they are part of a bigger team and they get some component of that. So that work—they are sort of slotted into a bigger team of work that is already funded to be done. It would be logistically and cost-wise not very effective to have an honour student have to go through and then get an ethics approval; and then would not have the capacity to handle all the techniques; and then have to

do the training to handle animals; and do all that within nine months and get results and write a thesis. So they are brought into a team, they learn good practice by being in a larger team with more skilled people, and overall that is a much better learning experience.

Ms ABIGAIL BOYD: Good afternoon to all of you. I want to start just by reflecting. In your submission, Professor O'Connell, there is a bit of talk about 3D printing. And there is, across all of your submissions, discussion of the new technologies that are developing that the last witness referred to. She could imagine, maybe in a couple of decades, we could really quite radically reduce the number of animals in research. That is kind of where we are headed. It is hard to imagine those technologies until they come. That is true in a lot of areas, I guess. What is holding us back from developing those technologies quicker? Is it a product of purely a lack of research funding from the Government, or are there other commercial factors at play? What do you think?

PHILIP O'CONNELL: I think you would never ask a researcher to give up an opportunity to say it was not due to lack of funding. So I put that definitely on the record. In reality, these are new technologies and you have to develop them. And then, once you develop them, then all of a sudden you have a capacity that you never had before. So that is one of the ways that things change—you are not there thinking, "Well, instead of doing it in animals I can do this." What you say is "This provides me an opportunity which doing it in animals would not do." A lot of that is through using combination chemotherapies on it or high-throughput screening of molecules. So all of a sudden you can do things at scale and then you can identify some combinations or some new treatments that you say, "This is really interesting". And then that may go to animal models, or it may not. So it sort of brings you a capacity that you never had and it does reduce animal use because if you had to do all of this in animals, a lot of those would not work. When you screen something, you are going for a needle in a haystack. It would not be realistic to do that with animals, but if you did you would have a lot of animals where it would be a futile outcome. Whereas if you have a much more focused set of molecules you are looking at, then you go to animal work, and that is more likely to get a positive outcome that you are looking for, which then moves further up the development scale. Could 3D printing overcome animal research? I think in some instances it will, but it is hard for me to see that it would exclusively in the next 10 or 15 years.

Ms ABIGAIL BOYD: Just to refocus that question before I come to you, Professor Schofield, when we are looking at the three Rs, to what extent does simple cost come into it when making a decision between, "Do we use this alternative technology or do we continue to use animals?"

PHILIP O'CONNELL: I do not think it comes down to that. In some places it may be availability. It is new technology and it is expensive. By being in a large precinct, like we are—for high-cost equipment, we put that into core facilities so that multiple groups can use it. I think that technology is developing, but if it gets to the point where it can give you the information in a much more comprehensive way than you are going to get from doing an animal study, because everything has its limitations, then people will move to do that. As I said, the other thing that we can do because of the technologies and the tools that we are using—you can get a lot more information in a smaller number of animals than would have occurred 10 or 15 years ago. So having access to advanced imaging, flow cytometry, genomics, 3D printing—all those new technologies that are coming through now and are very expensive. Having good access to that and people who know how to use those machines properly will inevitably lead to less animal use.

PETER SCHOFIELD: Might I give you an example from the current COVID pandemic? Cell culture is a very valuable way of testing compounds. One of the compounds that was tested in cell culture was the anthelmintic drug ivermectin, but it was tested at a concentration far higher than is suitable to give to humans. In a sense, the flurry of excitement around trying to find ways of dealing with the pandemic meant that this ineffective and subsequently debunked approach had no validity, but non-animal testing said that ivermectin could reduce the impact of the virus in cell culture. It was just dangerous for humans at that dose. That little vignette highlights that there are absolutely ways that non-animal testing can be used, but we also need to make sure that they are right, relevant and meaningful for translating through to the human condition.

Ms ABIGAIL BOYD: I presume it is not your evidence that there will never be a situation where we could develop that sort of—where we could have tested ivermectin with some other, non-animal method.

PETER SCHOFIELD: I agree with you.

Ms ABIGAIL BOYD: Just not right now.

PETER SCHOFIELD: Correct, I agree with you. In that case, it was a known drug. There was already knowledge from use in animals. I believe it has been used previously in humans, but not routinely; I stand to be corrected on that. I am agreeing with you that that approach is not an inappropriate approach. We both agree on that. It was just that the rush to get something meant that an initial, preliminary result at a level and dose that was not appropriate for use in humans got widespread endorsement and people were using it without proper medical

advice, often causing serious issues and complications. That is the tension between bringing some of these non-animal methodologies through to the point where they become standard, accepted and widely used. And then, if they are cheaper and easier over animal use, as cell culture is, then that is where people would go.

ROBERT BRINK: Just circling back to what you were originally asking about—the barriers—I think one of those is developing a great and really reproducible way of doing something. If you are growing, say, an organ culture that you want to use for testing, it is actually incredibly labour intensive and very finicky. What we are asking is to maintain something which normally survives in a body outside of a body. In cell culture, where you have cancer cells, which grow very well in a suspension culture—they can wander around and do whatever they like. If you are asking for an organ to form and you need cells which are able to communicate to each other, form a structure and interact, that is a next level of complexity.

I am not saying that we will not get to a point where that is possible and we are able to do that reproducibly, but it does take a lot of refining. It is a bit like a Model T compared to a Porsche; that is the result of a lot of refining over many years, and so that can do a lot of things that the old cars could not. But that does require widespread uptake and people finding better ways of doing it through testing various things. An original idea can show a lot of promise but may not be universally great for testing a whole range of things without a bit of development, so that is the sort of thing that does require a bit of investment.

Ms ABIGAIL BOYD: The ideology, I guess, for a lot of government decisions around research and a whole lot of other things is basically that companies and the markets will come up with the solutions to push us where we need to go. When it comes to getting us to a point where we have technologies as alternatives to animal research that are more easy to use and cost-effective et cetera, do you believe that really there is no alternative to having government funding in those sorts of technologies? Is that what is going to be needed in order to hasten the pace of that change?

PETER SCHOFIELD: If we consider this from a new drug perspective, it goes through the regulator, which is the Therapeutic Goods Administration in Australia and the FDA in America. They provide guidance to companies about what data is needed to demonstrate the safety, reliability, efficacy and consistency of manufacture et cetera. Collectively the regulatory agencies would need to adjust their requirements. They would want to be harmonised, because if we moved over here and the EU and the FDA were there, then Australia would be deprived of a number of medicines if we raised the bar. On the other hand, all regulatory agencies are raising the bar in terms of quality and efficacy. So that would be something that I think governments would need to fund because they are asking their regulators to adopt alternative standards that they consider would provide safety to the community. So, yes, we can get there, but I think that would have to be government supported so that there was an evidence base for the regulators. The pharmaceutical companies, who are putting forward submissions, would then mirror their data according to what the regulators want and need.

The Hon. CHRIS RATH: Thank you for your evidence so far. Professor O'Connell, in your opening statement you spoke about what the impacts would be if we banned or curtailed research using animals or primates generally. I was wondering if you could expand a bit more on that. We heard from Professor Cunningham this morning that potentially scientists would just move overseas. A lot of the medical research funding might move to other jurisdictions. I was wondering if you could expand a bit more on what the impacts might be.

PHILIP O'CONNELL: Well, I think it would be wrong for New South Wales to be in a position that was not in broad agreement with the rest of the other States on this.

But as I said in the submission, if you look at medical research, it is a continuum. You are doing computational models in silico, computer designing things, and then it has to get tested in the real world. You can do some of that in laboratory-based work and in test tubes, but you also then need an animal model, especially when you are looking at disease-specific things. If you are looking at autoimmune disease or transplantation or kidney disease, that is a really complex interaction between immunology, physiology, endocrinology and all of these things. You cannot create that at the present time, even with 3D printing; therefore, these need to be worked in an animal model.

If you are interested in studying a disease, then what you are interested in is using the technologies that are available to you to get you the answers you need. An essential component of that is animal research. If that is not available to you here and you are a world leader, then you are going to go somewhere else where you have access to that type of research. I am not talking about going to some undeveloped country; you can go to the United States or to Europe or to Melbourne, where you would have that access and you would have other people working around you in this broader picture. I think the concept that you are working in isolation and you are doing these things totally out of your own curiosity—those days went out in the nineteenth century. Really it is teams of people with specific skills that are all brought together to answer a complex problem.

The Hon. CHRIS RATH: I asked this of a previous witness, as well. There would not be a jurisdiction around the world that has successfully banned or significantly curtailed the use of animals in medical research, I would assume, or any that you are aware of?

PHILIP O'CONNELL: None that I am aware of. If you look at the big drivers of medical research such as the United States, Europe and increasingly Japan and Korea, all of those places have access to animals for medical research. In some of those I would say our regulations are at a higher standard than those, and those were all considered first-class places to do medical research. Many of the people who come back and work here have trained over in those places. For our size and our isolation, medical research is one of our good-news stories, and that is because we do look outside ourselves to what is happening. But if you do not have all the tools available to you, then you are inevitably going to fall from that height.

The Hon. CHRIS RATH: I know this is a very difficult question, and it is probably not one that you can answer even if you take it on notice, but it is probably more just as a benchmark or for getting some idea for this inquiry. How important is it? What quantum are we looking at in terms of—if we went to a pharmacy or a hospital, how important is it? Is it that only a handful of drugs, for instance, on the PBS, as an example, have been tested on animals? Or is it that almost every single drug would have been? What sort of scale are we looking at? I do not think we would have any idea of that at the moment.

PHILIP O'CONNELL: The way I would put it is more generational. For me and the grey hair that sits on this side here, we have had the benefit of unprecedented improvements in medical health compared to our parents. If I look at what operations were done when I was an intern that are no longer done anymore because we have just improved things—we do not have to cut people open to stage their lymphoma like they did when I started training. If you look at what has occurred, we are the huge beneficiaries of a lot of medical research, and there has been an unprecedented increase in life expectancy in this country. If you take the thing about COVID and RNA vaccines, that all started when people identified toll-like receptors, which is a molecule on cells that—they see viruses and bacteria molecules. They were not invented; it was all worked out in animals. That was done—you would probably know—about 10 or 15 years ago.

PETER SCHOFIELD: In the nineties, yes.

PHILIP O'CONNELL: Yes. So, all of a sudden, that research has come into benefit now. Will I be disadvantaged in terms of my day-to-day life? Not much. But my children will and my grandchildren will, because there will be a stop in all of that. That is what I think is a generational change. We would be taking a system that has given us unprecedented good health at a global scale and putting that at risk for what I would consider to be no rational reason. Should we move to doing things that use less animals? Yes. Should we look for new technologies? Most definitely, yes. Regardless of what your views are on animal research, we should be taking that pathway. But it is a generational impact that we are having if we all of a sudden stop using that.

The Hon. CHRIS RATH: I have one final question. Generally to all three of you, how have you found the regulatory regime in New South Wales? I assume it is quite strict but hopefully not too onerous. How has it been dealing with the animal ethics committee?

ROBERT BRINK: I chaired our animal ethics committee at the St Vincent's precinct, which incorporates the Victor Chang institute, Garvan and St Vincent's Hospital, for a couple of years, and obviously I have been involved with them for many years. It is not onerous. It is not. There is a series of really fair questions, which make you think about what you are doing. Do you really need to use animals for this? You think about the three Rs as you are doing it. How many do I need? What is the best way I can do this? I think that is a huge improvement from when I started back in the late eighties. What I really like is the make-up of the ethics panels, which includes not only a couple of scientists but vets, two laypeople and animal-concerned people as well. They are all given, in my experience, a really fair hearing. All of their concerns are listened to and they interact really positively with the scientific and veterinary people on the panel.

I have seen applications be refused—quite justifiably, with the agreement of everyone—for certain projects. I think the whole process is good and well overseen by DPI, with their regular inspections and oversight. I think it is pretty good at the moment. I think it is covered really well. Animal welfare is really a top concern of the panel and filters through the whole system, all the way through to the people working in the animal house—the on-site animal welfare person associated with every animal facility, who is independent of the person who is physically running the logistics of the facility. They are there specifically to be the point person for animal welfare. I find that works really well and they have productive interactions with the researchers. It is a really supportive environment because everyone knows that having animals well looked after is the only way to actually get good data, to get reproducible data and to minimise the use of animals as well. My short answer is that I would give it a tick.

PETER SCHOFIELD: I concur with Robert's comments. But if I may go back to your earlier question, I am hazarding a guess but I doubt that there would be any drugs on the Pharmaceutical Benefits Scheme that have not been through some component of animal testing—not necessarily in Australia, obviously—as part of their regulatory and approval submissions.

ROBERT BRINK: I would add that the basic knowledge for why we know that those things are going to work came from animal work. Often the monoclonal antibodies which were generated to be used were made in immunised mice, so they are an integral part of a whole number of steps through the process. I would say it is the vast majority, to answer your question.

The Hon. WES FANG: Thank you very much, gentlemen, for coming today and appearing before the Committee. I imagine all three of you have familiarised yourself with the terms of reference for the inquiry; you would have done so when you put together your submissions. I appreciate that we have you for quite a long time today. However, looking through the terms of reference, you have already covered a lot with your evidence. Part (a) reads:

> … the nature and proposed effectiveness of medical research being conducted on animals in New South Wales, and the potential public health risks and benefits posed by this research;

Would it be fair to say that we have discussed that the medical research being done in New South Wales is, in your opinion, appropriate, considered, ethical, and for the benefit of the population of New South Wales—and, more broadly, Australia and the rest of the world?

PETER SCHOFIELD: Agreed.

The Hon. WES FANG: Okay, so we will go to part (b), which reads:

> … the costs associated with animal research, and the extent to which the New South Wales and Federal Government is commissioning and funding the importing, breeding and use of animals in medical research in New South Wales;

I do not expect that you will be able to provide much by way of costs, but do you know whether the importing, breeding and use of animals is a large-scale thing that is happening in New South Wales? Or is it something that is more bespoke and typically smaller in scale than what you might see in other jurisdictions?

PHILIP O'CONNELL: I think it is consolidating. The ABR, which Robert can talk to—we get a lot of our animals from there because they provide a good facility and they are a very professional organisation. That means that there is much more efficiency in breeding the animals than doing it yourself. Unless it is some bespoke animal that for some reason cannot go there, I would say that most of the animals from our institute are bred there, in terms of mice. Non-human primates—these are national colonies, and they have oversight by the NHMRC. They are captive bred; they are not imported. I am personally unaware of any of those animals that are imported for that. There is some work in large animals—they are normally sheep or pigs—and they are not imported. The main animals that are imported, to my knowledge, are a specifically genetically modified mouse. You normally go to The Jackson Laboratory, which is a world-famous place in Maine, in the US, that has a big reputation for this. They would bring animals across, and then you require AQIS permission, and then they would be bred here. So most of that is done here and by consolidating this, there are cost efficiencies.

PETER SCHOFIELD: May I just add one brief comment to that? Firstly, I do understand, and I would need this to be confirmed by the primate colonies, that there is occasional importation of colony-bred primates for genetic refreshment of the colonies—so that is just a slight correction there—but certainly not of any wild primates.

The Hon. WES FANG: We are not sending somebody over on a plane with a net and a tranquiliser gun and smuggling them back.

PETER SCHOFIELD: Absolutely not. In terms of the economic argument, I do not know the specifics on this for the national primate facilities in terms of their funding arrangements. But at NeuRA we, too, opted to use ABR as a much more efficient way of managing breeding, using fewer numbers of animals because they could be housed at one colony and effectively transported to the various usage sites and so did the University of New South Wales, when the ABR started, and many others around the State and country. You asked a question about the terms of reference. The Federal and State dollars would largely come from research grants, so the individual researcher would be paying for the supply and delivery of those animals. The institutions cover the housing and maintenance of those animals, typically, once they are on site, often with a per-cage charge for room cleaning and the like.

The Hon. WES FANG: That is what is really important. Just by going through the terms of reference, we are able to drill down into the issues that we refer to when developing a report.

PHILIP O'CONNELL: The other point to make about the NHMRC dollars is that they have strict rules on how much they will give you for provision of animals for your research and it never meets the actual cost. It has a success rate of less than 10 per cent to get an NHMRC grant. When you take that on, you are taking on a cost because it will not be fully funded by that research funding.

The Hon. WES FANG: I guess that is a disincentive for people to do animal research that is not of a substantial nature because of that incurred cost as the grant will not cover the total cost of the research primate or animal, as required. Part (c) reads:

> … the availability, effectiveness and funding for alternative approaches to animal research methods and technologies, and the ability of researchers to meet the 3 R's of Replacement, Reduction and Refinement;

We have talked about that. We have said that there is work ongoing, but we are not at the point where we can safely replace the use of animals in research, are we?

PETER SCHOFIELD: An individual could put forward a proposition to the State Government or to the Federal Government in one of those funding schemes for a particular research project to enhance the three Rs. It would then be assessed on its merits against all of the others, but there is no dedicated allocation of funding to achieve those goals.

The Hon. WES FANG: Part (d) reads:

> … the ethical and animal welfare issues surrounding the importing, breeding and use of animals in medical research;

We just covered that quite succinctly. We covered the issues of not only colony breeding of large primates but also that where new genetic material is required, it is done through an import program in an ethical way.

ROBERT BRINK: I could add a point there. There has been a big advance recently in terms of using sperm as something you send over the seas, rather than transporting live mice. What we have at ABR and lots of places now is the ability to basically do an IVF with imported sperm, so that has really cut down a lot on the transportation of live animals. That is a great example of the three Rs applying in that particular sphere.

The Hon. WES FANG: Yes. The ethical treatment of those animals is paramount and it is quite strictly regulated within your organisation. Would that be a fair thing to say?

ROBERT BRINK: Absolutely.

The Hon. WES FANG: Part (e) reads:

> … the adequacy of the current regulatory regime regarding the use of animals in medical research, particularly in relation to transparency and accountability;

I have no doubt that every one of the organisations that you represent and with whom you may have association around the research use of animals is quite heavily regulated. Would you say the transparency and accountability is of a high level, if not the highest level?

PHILIP O'CONNELL: I can vouch that your ethics committee and your animal facilities are going to get audited and DPI have audited that. There is community involvement, so it is transparent, and there are people from animal welfare. This is as open as it can be. As I said, your work is audited by your ethics committee and the ethics committee is then audited by DPI, and, in the case of primates, by several other bodies as well.

The Hon. WES FANG: Chair, with your indulgence, I just have one more part to get to. Then I could say that I am done with my questions because these gentlemen have really covered off everything.

The CHAIR: Okay. Just be quick, then.

The Hon. WES FANG: Part (f) reads:

> … overseas developments regarding the regulation and use of animals in medical research;

The bit that I wanted to touch on there was, are we in line with what is happening in other jurisdictions around the world? And is the regulation in Australia likely to be stronger than some of the other foreign jurisdictions? If we were to not allow or to limit the amount of research that was happening here and it was sent overseas, would there be a lower level of regulation, transparency and accountability, in your opinion?

PETER SCHOFIELD: I think there are two parts to that question. The first one is: Do Australian standards and New South Wales standards conform to the best standards around the world? I think the answer is yes. Do the other jurisdictions have something that could assist in reducing numbers of research? I touched on that earlier with the three R centres in the UK and the Netherlands et cetera. We do not have that, so that is a way where we could enhance the reduction, refinement and replacement of animals in research. The final piece, I think, is very important. In his earlier comments Philip talked about individual researchers moving to an environment

that enabled the full spectrum of medical research, but equally I think it is a cop-out for us as a society if we ban something here but allow it to happen elsewhere. We do not have slavery here, but you can pay money and have your stuff made somewhere else by slavery. In the same way, we would be doing a disservice and being inhumane to the use of animals for research if we allowed that back-door approach.

The Hon. WES FANG: Abrogating our social responsibility, yes. Chair, I think they have covered off very well, and I thank you very much for that indulgence.

The CHAIR: Thank you. It is my turn. I will pose the questions that I have here and one or all can answer, as you feel. I am wondering if you could direct me—and perhaps other Committee members might be interested, if such exists—to where we might find a diagram, like a flow chart of sorts, which would explain the steps that are required as a general proposition that one moves through from conception of a medical research project right through to testing with respect to animals, just to help us grasp that. Would that be available as a document? I will explain why. I am struggling a little bit to understand the full set of stages in a typical project and how the stages are connected. My further interest is at each stage the level of detail behind that and its rigour.

PETER SCHOFIELD: Mr Chair, there are perhaps two components again. I think we might have to take it on notice to find a best example of that.

The CHAIR: Absolutely.

PETER SCHOFIELD: But I think it is also important to remember that it is very unusual for an individual to be involved in the very basic discovery research and take that particular thing the entire way through to a new medicine. It is a long process. It involves many different skill sets and so forth. But the diagram, I think we can come up with that, and we will take that one on notice.

The CHAIR: I suppose in particular looking at a hypothetical piece of research work—

PETER SCHOFIELD: I understand exactly what you are saying. If I could give you the example of—I am drawing a blank on its name, but the Foundation for Biomedical Research did an analysis of the 224 Nobel Prize winners in physiology or medicine, and 188, if I remember my numbers, had used animals in some component of their research. Now, we use the Nobel prizes as the gold medal of the Olympics of science. Every one of us would give our rear tooth or our firstborn—

ROBERT BRINK: There are a lot fewer Nobel prizes than gold medals.

PETER SCHOFIELD: Exactly. They are recognised because they are the epitome of innovation and change. Robert talked about monoclonal antibodies, which have a 30- or 50-year history of development in terms of our understanding of immunology, but today almost every new life-saving drug that hits the market is a biological based on an antibody therapy. Through that process, they rely on animals. Today the product that you buy is no longer made in an animal, but some of the early monoclonals were made in animals. It is that sort of continuum of building knowledge and then applying that knowledge. Again, Philip gave the example of the mRNA vaccine. Some complained around the COVID pandemic, "How could you just have this new technology in 12 months? It must not be good enough." The answer is that it has had two or three decades worth of development, and the humanitarian crisis was enough to make those expedited decisions worthwhile. If it was a normal process, I think it would still be another decade before we saw mRNA vaccines in widespread use.

PHILIP O'CONNELL: Prior to that vaccine, the shortest time from developing a vaccine to getting on the market was four years, and that was thought to be unprecedented. What happened here was highly unusual.

ROBERT BRINK: Chair, can I maybe clarify the original question? Were you perhaps talking about an individual project?

The CHAIR: Essentially, yes, so that I can understand—

ROBERT BRINK: Somewhere a researcher would have an idea—

The CHAIR: A proposition, yes.

ROBERT BRINK: They would apply for money. They would go through a grant funding agency, NHMRC—

The CHAIR: Particularly where the ethics body has a role, does that ethics body then report to DPI?

ROBERT BRINK: Something that was clearly unethical at the grant application phase would be flagged. But otherwise, if it was funded, then you apply to your animal ethics committee with a detailed proposition about what exactly you are going to do and why you are doing it. That would be overseen by the panel. It would go through rigorous oversight with feedback from all the members. You could be told, "No, that's

not going to fly," or you would be asked to answer a bunch of questions: "Have you considered this? What does this mean?" These responses go back, and the committee considers that and decides whether or not to approve the protocol. And then you need to have a set of trained people who have all been trained in handling and working with animals, all of whom are cleared with the committee as having been trained. You have designated those people as working with the animals. At that point you start your experimental work.

The CHAIR: Just to continue on, as an example, a student would have an academic supervisor and that student commences the piece of research that they are working on. Is there a role over the course of that research that is being undertaken that feeds back into the ethics committee? Or has the ethics committee, at that point of approval, effectively completed their remit?

ROBERT BRINK: You have to make an annual report.

PHILIP O'CONNELL: You have to put down your publications from that research.

The CHAIR: Are they in the public domain? Are they generally available or not?

ROBERT BRINK: The reports?

The CHAIR: Yes.

ROBERT BRINK: I do not believe so, but I would have to take that on notice. The publications certainly are.

The CHAIR: So when it gets to the end point of the production of the publication with respect to the research—

ROBERT BRINK: Sure.

The CHAIR: And the ethics committee reportage to DPI, that is for all research projects in New South Wales involving sentient animals?

PETER SCHOFIELD: Yes.

The CHAIR: One of the matters put to us earlier today was the matter of wastage—I will use that word; it is a bit of a vernacular term—of animals as part of animal research in this State. In fact, the submission I am looking at suggests that there are two million animals each year in New South Wales—I will just read it out. It reads:

> … NSW typically reporting usage of an excess of two million animals per year.

From this submission, it sounds like a lot of animals are excess to need; in other words, they presumably have some role in the research but then expire or are killed. Does that figure sound like a reasonable figure? Do you not know? Would you have to take it on notice? I presume that, without reflecting on the smaller animals, a number of those are rats and mice. Would that be a fair comment?

PETER SCHOFIELD: Yes. The DPI report figures do not dive down. They do report on species. If you look through that, you will see that the vast numbers are rodents and there are quite small numbers of higher animals. But the public figures of DPI do not give that breakdown, so I think that is perhaps something you would need to test with them. Again, we have both made the comment that we signed up to use the ABR—others also use the ARC facility in Perth—to provide animals because it is more efficient. To maintain a breeding colony requires animals. If the animals are not actually to be used then they become surplus, so then they would at some point be euthanised. I am assuming that is where that number is, although I actually find that number feels very large to me.

The CHAIR: Perhaps that might be the basis of a question on notice for you to reflect further on. In terms of the additional levels of conditions around experimentation with higher-level animals, if we move from the rodents to the non-human primates, and then we have sheep, pigs and others beneath that—perhaps hamsters and what have you. In terms of the detail around the additional considerations with respect to experimentation on these animals on that sliding scale or spectrum, there are presumably different conditions and different levels of requirements associated with judgement to be exercised in regards to whether or not there should be experimentation on a particular class or species. You can take it on notice. I am just trying get an understanding.

PHILIP O'CONNELL: Basically you have to put forward a good rationale for why you are using non-human primates. The other thing is that the numbers are so small and, quite reasonably, almost every individual animal is accounted for to the ethics committee. You have three ethics committees. There is your local ethics committee, which would probably have sent it out for scientific advice. They understand the local research conditions and the environment locally. There is then the Royal Prince Alfred ethics committee, which is the

ethics committee that looks after—well, it looks after the baboon colony here. But whatever the colony is, there is the ethics committee associated with the colony. And in the case of the baboons, there is also the Sydney university ethics committee, because it is all sort of related.

It then has to go to DPI for it to look at—I think I wrote all of this down. Then it goes to an NHMRC non-human primate research committee, where it is funded by the NHMRC—and that is most of that work—and then there is the Animal Research Review Panel of DPI. When it has been through all that, you can start. In our experience, all of the ethics committees and all of the research committees personally inspected the facilities, looked at the record keeping and looked at the research. None of us are complaining about that, but I think that level of oversight is much, much higher. You have to put forward a good reason why you are at the point where you think this is required to answer a specific question.

The CHAIR: I presume, that being understood by researchers, that they would not be putting up research projects willy-nilly, hoping they will just happen to get through on a good day. From what you have described, Professor, to a layperson that rigour appears to have a fair bit of thoroughness and gates through it.

PHILIP O'CONNELL: It does. You have to look at the steep cost of looking after these animals. Then you have to have an expert team to look after the animals as well, so it is personnel intensive and resource intensive, and it is slow. You are not going to get that done in a year. Because you have, say, one or two animals at any one time that you are studying, depending on the work, you cannot do a large number like you could with mice.

The CHAIR: In answer to one of the earlier questions the statement was made—I forget which professor made it, but it has also been made by other witnesses—that the standard of regulation in New South Wales is quite high and quite rigorous. Once again, take this on notice if you feel the need to do so. In your observations are there differences, perhaps marked differences, between the State jurisdictions in Australia in regard to this rigour? Or because the research funding comes from that point that has been described, and I presume no State wants to be seen as being at the bottom of the barrel, is there an internal pressure to maintain broad comity across the States?

PETER SCHOFIELD: I do not think any of us are aware of there being dramatic differences in the regulation between States. I think if there really was an outlier, it would be quite common knowledge. We do not know that.

ROBERT BRINK: And they are all governed by a Federal Act.

The CHAIR: Yes, indeed.

PHILIP O'CONNELL: Certainly I would say that compared to the US, which has very high standards in research—their federally funded research is the benchmark for every other country. People say the level of oversight and supervision is much more straightforward than here. Would that be fair? I would not say it is a big difference, and that is really more hearsay.

The CHAIR: Yes, that is your observation.

PHILIP O'CONNELL: Yes.

The CHAIR: In terms of the regulatory system in New South Wales, which has been described as being to a high and rigorous standard—once again, on notice, if you wish—are there nevertheless some matters within the regulatory framework that you think invite reflection by this Committee? Coming from this inquiry will be a report with some recommendations. As you know, those recommendations go back to the Government, which has six months to reflect and provide a response. We will be challenged as we work through this to develop recommendations. I am very interested to hear what your thoughts might be about possible areas, specifically about what we have covered today and with respect to your useful submissions, in terms of the terms of reference of the inquiry, which are quite broad. Are there any ideas that may have been thought about by yourselves arising from being invited to come and give evidence?

PETER SCHOFIELD: We have touched on that with our comments about enhancing support for activities to upgrade the three Rs, to contribute towards reducing the numbers of animals used and to start a COAG conversation about how that could be done nationally. We sort of need to bring everybody along together, broadly speaking, and COAG seems to be the way to do that. Those are some of the things on the positive side. We equally shared a comment before. You have just heard Philip's comment about the process for primate research approvals and Robert's elaboration from his period as an animal ethics committee chair. We can also stop this activity. It would stop the animal research activity, but you would also stop the medical research activity by regulating it in such red tape. There is a pragmatic level of how do you enhance good outcomes, ensure good training, ensure

good compliance, ensure good reporting and inspections and so forth, but in the same way not kill the system with bureaucracy and red tape?

The CHAIR: I suppose what led to the question was Professor O'Connell's comment that in the United States there appears to be—I am not putting the United States as a model for everything but in terms of the regulatory system there are perhaps greater efficiencies in the way in which matters are dealt with, considered and worked through. That was the basis of the question.

PHILIP O'CONNELL: I guess I would have to take that on notice. I would say that the thing that I think works well in the current system is that it is like the public health system. It is deregulated to ethics committees that know the researchers and know the conditions. They know who does good research and who does not. They have to report to a government agency, DPI, and there is auditing and inspection, but there is devolution of the regulations to where the work is being done. I think that system works well in the current framework.

It takes a fair bit of time to get through that whole process. If you look at the ethics approval in general, even for clinical trials—if you ask researchers what the problem is, it is getting through all the bureaucracy to strike a blow in anger, to use a paraphrase. Basically that gets more and more onerous as each year goes by. If you look at the framework we have, I think it is very good. Largely, we have a very good system that caters for the welfare of the animals. You would have to put forward an argument for why you felt additional regulation would improve that welfare.

The CHAIR: Out of interest, in terms of research done, New South Wales is a much larger State in terms of population and other factors. Is the work done in New South Wales much greater than in other States? Is it modestly greater compared to other States? For example, is much research done in Victoria?

The Hon. WES FANG: Not much is done in Victoria.

PHILIP O'CONNELL: They would say they are the kingpins of medical research.

The Hon. WES FANG: Are they kidding themselves?

The CHAIR: What about the other States?

PHILIP O'CONNELL: Queensland is really on the up and South Australia, relative to its size. I mean, how many people live in South Australia? About a million or a million and a half?

The CHAIR: So there is research undertaken across the Commonwealth?

PHILIP O'CONNELL: Yes, there is a group of eight universities.

ROBERT BRINK: In fact, one of the major animal facilities is in Perth. It was just closed down. Well, it is closing down.

PETER SCHOFIELD: It is not going to close down, but it was under threat.

PHILIP O'CONNELL: It was a real estate deal.

The Hon. EMMA HURST: I would like to talk a little bit about the rehoming of animals. Put transgenic animals aside and also put aside animals where it would be cruel to keep them alive at the end of research; I understand they are in a different category. I know that the ARRP has recently put out some guidelines to help research institutions, to encourage them to rehome animals. Do you think that is a good model, particularly for animals like cats and dogs? Should we be looking to assist in the rehoming in some way or to get some of these research institutions to work with already established rescue organisations, like the RSPCA, who are willing to take these animals in and find them homes?

ROBERT BRINK: We only work with rodents, but our animal ethics officer is organising rehoming of cats after they have finished their participation in research. As you say, they are not genetically modified; that is just the regulations. So, yes, that is something that the Garvan facility is definitely generating. I cannot comment on dogs and cats because we do not use them.

PHILIP O'CONNELL: There has been no dog or cat work done at our place in more than 25 years.

PETER SCHOFIELD: Likewise at NeuRA. I think this is a question you would perhaps have to put to—

The Hon. EMMA HURST: I guess my question is do you support initiatives to rehome those animals? Do you think that is a position we should be moving towards?

PETER SCHOFIELD: To the extent that it is possible, yes.

ROBERT BRINK: Absolutely and we are doing it already, actually.

PETER SCHOFIELD: You only need to walk the streets of the community to see the success of some of the greyhound rehoming initiatives. I am not sure of all of the ins and outs of numbers, but we certainly see it in terms of greyhounds as pets now.

The Hon. EMMA HURST: That is right. In your submission you mentioned the need to get animal ethics approval and we have talked about it quite a bit here. I asked one of the previous witnesses if they were surprised to hear that recently an issue came to the Animal Research Review Panel that animal research did take place with death as an end point without animal ethics approval and that was investigated with no real consequences. Does that surprise you that that is occurring and that there are no real consequences when it does occur?

PETER SCHOFIELD: Yes, surprises and distresses. We have a system which we put faith and confidence in. Correct me if I am wrong, but I believe you need ministerial approval for a "death as end point" experiment.

The Hon. EMMA HURST: No. I think the LD50 and Draize tests need ministerial approval.

PETER SCHOFIELD: But LD50 is a "death as end point" example.

The Hon. EMMA HURST: It is one of them, yes.

PETER SCHOFIELD: Robert, you may have a comment on death as an end point. But in general you start from the premise in your ethics submission that death as an end point is not an acceptable outcome because of the unreasonable suffering of the animal. Secondly, if that was the case—and obviously we are just relying on commentary at this point, not evidence—that feels to me like a matter for the department and the police to investigate.

The Hon. EMMA HURST: So you think it should have gone to the department and the police for an investigation, and if people were found to be guilty of that then something under the Act should have happened?

PETER SCHOFIELD: The research community is afforded a wide privilege by the parliaments of Australia to enable the use of animals in research, and our obligation is to reciprocate by doing that when it is appropriate and justified, under approval, and adhering to the three Rs. That is the societal compact that we have. We in the research community have to both adhere to our side of that bargain and also be willing to accept the consequences of deviation.

Ms ABIGAIL BOYD: I want to talk about the publication of negative results—I do not know what the expression is; the failed experiments—and what the hurdles are to having transparency over those sorts of research results that we do not duplicate.

PETER SCHOFIELD: There is a big move to pre-registration. It already happens as a mandatory issue for clinical trials. You need to say what the trial is about, how you are going to do it, what your hypothesis is and what you hope to see. That transparency of pre-registration means that people can go back afterwards and see if there were deviations and so forth. In the same way, there is also a move to the registration of other experimental work—animal work, for example—so that you have actually made that statement up-front. The previous witness referred to people making arbitrary decisions. A supervisor says, "Those animals aren't giving the result. Kill them all." That would be a very big red flag for the ethics committee in your annual reporting because you have permission to do a particular set of experiments.

You have to report unexplained deaths. Even if a rodent dies, you have to stick it in the freezer so that a post-mortem can be done. So that feels like a little bit of hearsay going on without evidence. But certainly experiments will be done that did not produce the anticipated outcome, and you are correct that that probably—if you were looking for effect X and you saw nothing, that probably would not be published because you saw nothing. Again, that is when the pre-registration of experiments becomes useful because then there is at least an annotation of, "This particular investigation was done and no effect was seen," so that the knowledge is not lost.

Ms ABIGAIL BOYD: I will come to you, Professor Brink. If there was a pre-registration of something similar to research you are about to do, how easy is it to find out what the results of that research were? Do you support it being more transparent?

ROBERT BRINK: Sorry, can you just clarify that? Pre-registration in terms of—

PETER SCHOFIELD: The experimental protocol.

ROBERT BRINK: With the committee?

PETER SCHOFIELD: Well, I guess the move has been to do it in the same way as you register your clinical trial with the clinical trials registry in the US, or the Australia and New Zealand one. Then you do your trial, but people can go back and see what the protocol was. So there is a move to say, "As you develop your ethics submission, you should also register what your particular study is so that others can see that."

ROBERT BRINK: I am sorry, I was not aware of that.

Ms ABIGAIL BOYD: That is okay. What is to prevent you doing the same experiment again?

ROBERT BRINK: That is an excellent point. The main reason negative results do not get published is because you would not get them accepted under most circumstances. Often negative results are published as long as you did an experiment where you thought, "This might be the case," and you found that it was not; you went and did a second experiment, because if that was not the case then this may well be the case; and then you had a positive result to go along with it. Those things tend to get published together. But the negative results on their own are very difficult to publish. Unfortunately, for researchers to keep their jobs they need to publish. There is a big pressure there. That is the major one.

Ms ABIGAIL BOYD: Are there competitive pressures as well in terms of not wanting to publish the negative results in case it helps someone else get to the same point?

PHILIP O'CONNELL: I would not have thought so. There is trying to be a move away from counting how many publications you have done to say what are the most impactful ones. I think Robert outlined some of the challenges. The thing about things being published is that it is normally internationally peer reviewed by people external to your organisation, so that gives it a degree of rigour. Increasingly, journals are asking for more and more background information, which they then put up in the cloud, that you have to include—especially good journals—when you put those publications forward.

With a negative result, if your hypothesis was, "You do this and this happens," and you started off and it did not, you might then start to reassess rather than go through the whole gamut of experiments which you think are then going to be futile. Sometimes with negative results, the data—you have sort of changed tack. If you are sensible, you will have changed tack and gone down a different pathway rather than pursuing the negative to a point that it would then hit the scientific rigor and get published but would not be in a particularly good journal. It would take you quite a long time to publish. There are a lot of forces out there that make that difficult to do. There are places—I have forgotten the name—where you can put pre-publication things.

ROBERT BRINK: bioRxiv.

PHILIP O'CONNELL: Yes, bioRxiv. There are now becoming increasingly these archives where you can put data that has not been peer reviewed. So there may be opportunities where that could go.

The Hon. WES FANG: Chair, I was going to suggest, given that the Government's questions have all been answered by the witnesses quite succinctly, that the Government's time be ceded and we extend lunch a little, noting that you will have some time after. The Government's share of time can be ceded to permit the gentlemen some extra time. Given that we have a shorter lunch break than we normally would, it might allow us to have a bit longer for evidence.

The CHAIR: We have about eight minutes; there will not be much in it. Thank you. Professor Brink, in your submission you made some comment, on the second paragraph of the third page, about the concept of One Health. I am wondering—and perhaps the other professors, if you wanted to do so—if you could elucidate on One Health. Is that something which is on a trajectory going upwards or has it just started? What is the case? If you need to, take it on notice. I do not mean to drop you in it.

ROBERT BRINK: I did not individually write this report. I am sorry.

The CHAIR: No, that is fine. Take it on notice. It is not an ambush. Can I follow up with this question, which arises from the terms of reference, about actual or potential public health risk from using laboratory animal species? How does that rate? Is it something to be concerned about?

PETER SCHOFIELD: The risk to the community of doing animal research, in terms of an actual physical health risk, is obviously very low. Equally there are legislative and society standards that we all adhere to and accept and respect. But the flip side is actually catastrophic. The risk to humans of something that could have been stopped and is not will be people dying. People are maimed. That is what we, as medical researchers, are trying to alleviate. This is the tension of this particular area, which rightly attracts community concern and attention and focus. We have to balance the health and wellbeing of people with the respect for animals used in medical research.

The CHAIR: It was put to us by a witness earlier that what is required in regards to dealing with this issue of animal welfare with respect to experimentation is a paradigm shift, a change in thinking, about the way in which we have considered the use of animals in the past. If we do not do that, we are just going to continue on with what we are doing into the future. Who knows where it ends up or how long it might take to bring down those numbers to what might be judged to be a satisfactory level, whatever that might be defined as? I was just wondering if you had a comment about the idea that, in effect, we are on this track for the way in which animals are being used in experimentation for medical purposes, and that track is defined and we are just going in the one direction and we cannot depart from that track, it is very fixed. Would you like to comment on that?

PETER SCHOFIELD: Certainly, thank you. A researcher's job is to innovate and to find new knowledge. Researchers are, by definition, always looking for new ways to answer the question. They start from a discovery perspective—the Nobel Prize example from earlier—and they move towards translating their research into improving human health and wellbeing, and there is a long continuum. The suggestion that researchers are stuck and all they want to do is keep on doing what might have happened in the past, I do not think that carries traction. As we have said, it is expensive, it is time consuming. If you could answer the question by computer modelling, people would have done that or would do that. As one particular example, it is hugely effective as knowledge has grown in drug discovery and development. It reduces the number of compounds that actually end up at the back end of the testing process. I will let my colleagues elaborate.

PHILIP O'CONNELL: I think, as Peter said, that the people who end up doing this and have done PhDs and post-docs are at the front end of innovation and lateral thinking. You have taken that part of society to do this. What does happen is that things we did not even dream of 20 years ago come up, and the obvious place to work things out is in these animal models. They now have these gene atlases, where they can do the genetic make-up of each single cell and then put that back in what is a complex organism. All of a sudden, we had a morass of genes and had trouble making sense of it. You can now put that down to each individual cell within something as complex as a kidney or an eye, and you just cannot do that in humans. But when you get that information from animal research, you can transfer that across to the human condition, and it really opens a whole lot of new research opportunities and therapeutic opportunities that did not exist 10 or 20 years ago.

So I think there is an immense amount of innovation, and we are definitely not just doing as we did. It would be sort of like saying—at the turn of the century on ships they were doing surgery and chopping off limbs. We are still doing surgery, but it is a lot different. They have not done away with surgery, but what we were doing 20 years ago in surgery and what we are doing now—you couldn't have dreamed of it. Operations have just been overtaken by other treatments, but then new operations come up. You have robotics. It is just a whole changed field, and it is the same in medical research. We are still using animal research, but what we are doing now is completely different to what we did 20 years ago.

ROBERT BRINK: Yes. Rather than a paradigm shift there is a continual technological push, which is bringing new advances all the time. Philip touched on one, which is the ability to look at a whole bunch of single cells from an animal and be able to dive into each of those cells and basically map every gene-derived molecule within each individual cell. That is something that people have been jumping on because it means that we do not have to use 20 or 40 animals to get this information. We can look at a few and get this mass of information from just a couple of them because we have used this new technology. People are looking to minimise the use of animals, cost-wise and from the investment of time required, as well. So there is an ongoing incentive for everyone to reduce their animal use, and I think that is something which will keep going.

I cannot give you the data, but my experience is that we are using fewer and fewer animals all the time. And what we do use them for—the impact is much higher than it used to be. I see that as an ongoing trend and a really encouraging one. I just want to go back to the "one health" thing now that I see it. The person from Garvan who wrote this is our animal welfare officer, who is a vet. He has a particular interest in drugs which are given to companion animals et cetera. The point he was making is that a lot of the advances we make through animal research apply to humans but also to veterinary practice. A lot of the same drugs—if they work in a mouse and a human, for instance, they are obviously going to work across the spectrum. That was the point there, I think.

The CHAIR: With respect to medical research into the health, welfare and wellbeing of non-human animals, is that undertaken on animals themselves to advance medications for improving the health, welfare and wellbeing of animals? In other words, is there experimentation on animals for the benefit of animals happening?

PETER SCHOFIELD: Yes, in veterinary science and in agricultural science. That is probably outside of our particular—

The CHAIR: I just thought I would raise it because it seemed to me that the advances in what is available to treat animals for various conditions is obviously arising from research, and that research presumably involves at least the consideration of work done with animals. Gentlemen, thank you very much. It has been most

informative. I appreciate that you are all very busy and that you have made your time available. There have been some questions taken on notice, and I suspect some supplementary questions will be provided to you by the secretariat. Thank you all very much.

(The witnesses withdrew.)

(Luncheon adjournment)

Ms SARAH MARGO, Solicitor, Animal Defenders Office, before the Committee via videoconference, affirmed and examined

Ms TARA WARD, Solicitor, Animal Defenders Office, before the Committee via videoconference, affirmed and examined

Dr SUZANNE FOWLER, Chief Science Officer, RSPCA Australia, before the Committee via videoconference, affirmed and examined

Dr DI EVANS, Senior Science Officer, RSPCA Australia, before the Committee via videoconference, affirmed and examined

The CHAIR: I welcome our witnesses. I remind members to make sure their mobile phones are set to silent. I will invite each of the two organisations to make an opening statement. I presume each has decided who will do that. We will then proceed with questions. We have representatives from the Opposition, the Government and the crossbench. We will share the questioning around equally in the time available. I confirm that we have received the Animal Defenders Office submission, No. 245, and the RSPCA submission, No. 222, which have been processed and uploaded to the inquiry's webpage. With that brief coverage of the formalities and some other general points, I will invite Ms Margo or Ms Ward to make an opening statement.

TARA WARD: Thank you, Chair. I will make our opening statement this time. On behalf of the Animal Defenders Office, thank you for the opportunity to provide evidence at today's hearing. This inquiry focuses on an incredibly important area of regulation because it involves keeping many thousands of animals every year in cramped and artificial living conditions in New South Wales medical research and breeding institutions, and inflicting serious psychological and physical harm on them. Accountability and transparency in the animal medical research industry is minimal, to the point where it is questionable whether the industry can say it has a social licence to do what it does. Time and again we speak to members of our community who have no idea that animals are used for research in Australia. They think it does not happen here and that it was something that happened in the distant past but not anymore. They have wrongly assumed that we and science itself have progressed and moved beyond such antiquated methods.

At the Animal Defenders Office we believe that this is achievable. With the right incentives, including government funding and industry support, research institutions can wean themselves off those antiquated scientific procedures without diminishing outcomes for human health, which could in fact be optimised by embracing alternatives to animal testing. To help realise this civilised and humane objective, we would urge the New South Wales Government to commit to improving transparency by requiring increased public reporting about animals used in medical research and to supporting the development of non-animal alternatives. Ideally the latter would be overseen by a State institution for the advancement of non-animal alternatives and technologies in New South Wales. With those initiatives, New South Wales would be following international jurisdictions such as the EU, the UK and the US, rather than being left behind using techniques that hark back to vivisection in the 1600s when animals were regarded as nothing more than machines. Thank you.

The CHAIR: Thank you. We will now proceed to the RSPCA.

SUZANNE FOWLER: Thank you. I would like to thank the inquiry on behalf of RSPCA NSW and RSPCA Australia for the opportunity to present today. Dr Grace Hopper was a famous computer scientist who once stated, "The most dangerous phrase in the English language is, 'We have always done it this way.'" The research world is full of firsts—in fact, change and progress are integral to its very existence—yet there is a lack of momentum and incentive for researchers to move away from the way it has always been done, especially when it comes to using animals for medical research. A significant culture shift is needed to make change happen. We need to move forward and recognise that there may be a better way: to use fewer animals, refine techniques and respect animals' rights to a life worth living. We note with some positivity that many submissions and the discussions earlier today have supported similar initiatives to those suggested by the RSPCA, and we believe that there is an opportunity for change within the research community.

Significant progress has been made in the EU, the UK and the USA in replacing the use of animals in research and regulatory testing. The RSPCA has strongly advocated for many years for the establishment of a national centre for the development and implementation of non-animal alternatives and supporting research in the three Rs. The RSPCA also has a longstanding position that transparency and accountability are integral to ensuring long-term, positive animal welfare outcomes and improvements. The RSPCA supports the development of an openness agreement that details why and how animals are used in research. Related to this need for transparency and accountability, the RSPCA supports the timely publication of animal use statistics, which includes outcomes from projects and studies, including those which are not published or which did not achieve the stated objectives.

A common international concern at present relates to the reproducibility and translatability of research outcomes. In our submission, the RSPCA has identified a number of areas where improvements could be made to ensure that animals are not used unnecessarily and to ensure that, where animals are appropriately justified to be used, the results are scientifically robust and truly do contribute to advancements in medical research. A few areas we have suggested include rigorous peer review for proposed research studies prior to submission to the animal ethics committee to ensure scientific robustness; mandatory compliance with the ARRIVE 2.0 guidelines, which provide a clear outline for the reportable features of any biomedical research program, to ensure that reproducibility can be achieved and encourage researchers to review common factors that can achieve research outcomes; and the review of high-impact studies, such as forced swim tests and inhalation studies, in terms of justification for their continued use.

Investment is required to achieve those improvements and to make positive improvements in animal welfare outcomes. In addition to the resourcing we identified in our submission, further investment could be centred on appropriate resourcing of animal research facilities to ensure that they provide the highest standards of animal care; improved housing, management and handling of research animals to meet species-specific physical and behavioural needs; the development of regulation based on compulsory standards under animal welfare legislation that is species specific; and a stronger focus on staff training to ensure that all staff are competent in all procedures conducted and that appropriate records are maintained to demonstrate this.

The RSPCA acknowledges the importance of the current regulatory framework in helping to safeguard the welfare of animals used in research but can also identify several areas for improvement, both in New South Wales and Australia-wide. We recognise the importance of the ARRP and the requirement for reporting within the New South Wales framework. However, we believe it is essential that there is an ongoing commitment by government and the research sector to reduce the reliance on the use of animals, to increase transparency and accountability, and to ensure that only the highest standards of animal care and welfare are achieved. Without this, there is likely to be increased questioning and mistrust by the public, which will affect its social licence.

The CHAIR: Thank you very much. The opening statements sit nicely with the submissions, and that provides us with much material to ask you questions about. We will commence with the Deputy Chair.

The Hon. EMMA HURST: My first question is for the Animal Defenders Office, to either one of you that may want to answer this. A concern that we heard this morning was that whistleblowers within the industry often do not speak out. They do not go public or speak out against it. Does our legislation support whistleblowers in this industry if they did have concerns, or does our legislation actually gag whistleblowers from within the industry in animal research?

SARAH MARGO: Perhaps I can start with this and then defer to Tara to continue. Thank you for the question. Looking directly at the Animal Research Act, there is a provision in section 56 referring to the disclosure of information. The way this is presented, in our legal opinion, actually stymies any of the efforts of whistleblowers and does not offer any kind of protection for someone who should wish to disclose some kind of contravention under the Act. It does have exemptions provided for in that section; however, they are particularly limited. Essentially, on a basic reading of it, as a whistleblower you could have no confidence that you would be protected by the Act. There are some legal mechanisms that operate outside of the Animal Research Act; however, these are very complicated. They do not guarantee protection, such as the disclosures Act. I might refer to Tara to mention that now.

TARA WARD: That would be the New South Wales Public Interest Disclosures Act 1994. While that exists and does potentially cover universities, which may be regarded as public authorities, it typically protects disclosures made by public officials about corrupt conduct—maladministration or corruption in the carrying out of public duties—made to an investigating authority. Once again, any sort of guarantee that a whistleblower would be protected—of course, depending on where that whistleblower is coming from—is quite a complex legal question.

The Hon. EMMA HURST: And is that something that this Committee should review? If we are talking about animal protection, should we be reviewing that to ensure that if somebody did want to come forward with information inside these research facilities—especially given a lot of these industries that have come in this morning have said that there is transparency and that there are no issues with transparency—but if we potentially have legislation that gags anyone from within the industry speaking out, is that something we should review?

SARAH MARGO: Yes, absolutely. I think it is imperative that we have legislative protection for whistleblowers, especially in an industry like this where it concerns using sentient animals in procedures that we know cause harm and suffering, and also considering that any attempt to come forward by a whistleblower is impeded by factors outside of the legislation as well, in terms of peer pressure from people you work with, questions about job security and your reputation within the industry. There are a lot of factors that would

disincentivise someone from speaking up. Short of having clear legal protection, I think it is safe to say that some people would not be willing to risk coming forward.

The Hon. EMMA HURST: This is a question for both the RSPCA and the ADO. We have had a lot of submissions about two experiments and a lot of submissions suggesting that one of the recommendations they would like to see from this inquiry is a ban on two particular experiments: forced swim tests and smoking models used in research, particularly nose-only smoking model testing. What would you like to see as recommendations from this inquiry and why? What are the welfare implications for animals or the scientific validity questions around those experiments?

SUZANNE FOWLER: From the RSPCA's perspective, we think there is a significant lack of justification to be using those experiments, given the very high impact they have on the welfare of animals. We know that, for instance, with the nose-only smoking model, not only is the animal—in most cases, a mouse—being exposed to smoke being forced into its lungs, but there is also the feeling of not being able to escape the environment. The ongoing stress of that and the fact that they are repeatedly exposed to that day after day, generally five days a week, Monday to Friday, because that is what is convenient for the research student. Straightaway, it is convenient for the research student or the research paradigm but not necessarily convenient for the animal, and that is not taken into consideration.

The Hon. EMMA HURST: Sorry, Ms Fowler. Can I just interrupt? If an animal is addicted to nicotine—you said five days a week. What happens in the two days where the animal is not being smoked? Are they experiencing a comedown from that nicotine addiction?

SUZANNE FOWLER: I cannot comment on that, unfortunately. I am not quite across that side of the science. But we do know that it is generally Monday to Friday that these experiments are run, and the following week it is done again. I am not too sure about the implications of that with nicotine addiction. But we would strongly suggest that these models are not justified in most circumstances, and we highly recommend that there should be special provisions if you are going to do such high-impact studies. There needs to be a very, very clear justification rather than, as I said in my opening statement, "That is the way it has always been done." I think there are much more modern methodologies that could be done these days and also already significant evidence that smoking causes cancer. Whether or not these animal models are truly translatable to the human condition is questionable.

The Hon. EMMA HURST: Thank you. ADO, do you have anything to add to that, either for the smoking model or for the forced swim test?

SARAH MARGO: Yes, we do. As a community legal centre, we cannot really comment on the scientific research other than what we have read and what is available. But from a legal perspective, it is interesting to us that other commercial companies, big pharmaceutical companies, are voluntarily moving away from using these kinds of tests and setting a precedent in other parts of the world where these are no longer accepted or considered necessary or justifiable. With that as a standard for best practice, we think it makes perfect sense to follow in the footsteps of that kind of precedent. That same voluntary commitment has been made by a selection of universities in Australia.

The Hon. EMMA HURST: Thank you. I want to talk about a case study that was mentioned by the ADO in your submission about someone that was attempting to get animals out at the end of an experiment simply to rehome them and the facility would not release the animals for rehoming. Can you give us some information as to what the issue was there? You mentioned that DPI was being very difficult and would not be transparent to allow those animals to come out. Could we get some more details around the issues you were having with DPI and the reasons given by the research institution as to why they would not release those animals for rehoming?

TARA WARD: Thank you, Deputy Chair. I am conscious of confidentiality issues, but I know that this inquiry probably trumps those anyway. But I will try to respect both. Basically, that was a situation where some members of the public were very concerned to try to rescue some animals who were being used as a control group for testing a vaccine used on animals of their species. These were animals who had survived the research and had not been affected or injected with the substance being tested. From that perspective, they were eminently suitable to being released. However, the members of the public went through every step and process that they should have gone through. They consulted with the researcher. They consulted with the institution. They presented their evidence.

They really put a solid case for why these few animals could be saved at the end of the project—it was not about disrupting any research project—and yet that was refused. And so it went to the Animal Research Review Panel and that was refused again. That is why, as a last resort, it was taken to the NSW Civil and Administrative Tribunal to try to get an objective review of those decisions. It was there that we could not even

get past the first step because at that point DPI—in amongst the whole process, which took a long time, DPI was involved, as well as those other entities. It was only at the tribunal that DPI announced that it was a different project because they had never provided the original project or protocol number and there was now a different project or protocol number.

It was something as basic and as fundamental as that, which had never been disclosed to the members of the public. The members of the public could never have known that without it being disclosed to them. It would have taken a line in one of the very many pages of correspondence about this whole issue. To have it put forward at that point and then used as an argument that the tribunal did not have jurisdiction to hear the matter, which we argued against—we were partially successful, but ultimately the case had to be dismissed on that ground. It could not even get to the first phase of substantive argument, and that was because DPI presented at that moment a crucial bit of information it had withheld up until that point. In my view, that is going against every principle of being a model litigant and also being a fair and objective regulator in this space.

Ms ABIGAIL BOYD: Thank you, and good afternoon to all of you. Could I start with the RSPCA, with Dr Fowler and Dr Evans. In your submission you talk about the need for pre-registration of animal studies on a central database in order to counter this problem that we were discussing with previous witnesses about not publishing negative findings. Could you talk to that recommendation and explain why, in your view, you think that there is such—is it reluctance in relation to publishing negative findings, or is there simply no procedure available for people to publish those findings?

SUZANNE FOWLER: From our perspective it is multi-factorial. There is no incentive to publish negative findings at the moment. In fact, even as alluded to by previous people today, there is almost a disincentive because to publish something that is negative is seen as a negative on your career. It generally does not hit high-impact, peer-reviewed journals, and so it is not considered a [audio malfunction] study. As a result, they do not want to waste their time, for want of a better term, to spend time publishing negative results. I think that is one problem.

The reasoning behind suggesting pre-registration is along the lines of human clinical trials. Before there was pre-registration of those, there was no tracing of what had been trialled in humans and then trying to stop that being reproduced elsewhere in the world or by another researcher. And so pre-registration of human clinical trials was made to try to limit the reproduction of previous results that had been a waste of time and investment. We believe that pre-registration of animal studies would have a similar positive impact in that it forces somebody, one, to commit to what their statistical model and the experimental model should look like, so that they cannot then change the way they interpret the data after the study has been completed; and, two, to reduce the chance of someone else trying to reproduce exactly the same study and get the same results and waste further animal lives.

Ms ABIGAIL BOYD: Thank you. Are there other jurisdictions that provide for that sort of central database to publish or to pre-register animal studies, or would this be something that would be setting new ground?

SUZANNE FOWLER: There is nothing else in Australia. There is a German website that anyone in the world can register their studies on, and I believe there is another one perhaps run out of somewhere in the EU, maybe Norway or the Netherlands. I am not 100 per cent sure on that. In our submission we have referenced the German link. That is available in English and, as I said, to international people to pre-register, but there is no requirement for it. It is not mandatory, as far as I am aware. It is just there should you wish to do so. It walks through good experimental design, as well, which—as I said, I think it is really important for researchers to be committed to the experimental design at the outset, to ensure that has been followed through, to ensure good statistical modelling through the interpretation of the data.

Ms ABIGAIL BOYD: Can you anticipate any sort of commercial competition issues in that? Is there any perceived need to keep those sorts of research results confidential so as not to assist your competitor with their own studies?

SUZANNE FOWLER: My understanding is that it can go under—I cannot remember the term, but it can be kept confidential for up to five years, at which time you can then commit to releasing it. It becomes automatic after five years, so you do get that period of time where it is kept confidential to allow you to progress any confidential matter. That deals with that risk, I guess—commercial in confidence.

Ms ABIGAIL BOYD: So to the extent that two different companies were trying to research the same sort of issue, it is possible that even with the pre-registration of a particular study using animals, you would still get a duplication in that study by another research team trying to do it quicker?

SUZANNE FOWLER: Correct. What should happen—if it is negative results, you should be able to choose to publish the findings sooner, to try to avoid that situation. But, yes, if they are both kept confidential for the same period of time, there would still be that risk. Absolutely.

Ms ABIGAIL BOYD: Thank you. One of the other things that you touch on in your submission, which we do not hear a lot about in any of the animal welfare related inquiries that we have sat on, of which there have been many in this Parliament, is the issues in relation to workforce and the impact that the usage of animals as a product can have on employees. Do you have any insight into the turnover rates of staff within medical research facilities or any insight you can share on the mental health impacts on employees?

SUZANNE FOWLER: Yes, I can talk to that a little bit. I do have personal experience in the medical research field. I did work in the field for a fair while and managed a number of staff who did suffer from compassion fatigue, unfortunately, which comes as a result of caring for animals for a long period. Most people who work in this field are very committed and love animals, and they work in this field because they love animals. Unfortunately, having to euthanise large numbers of animals is a requirement of the role, and that can lead to a clash of personal values and subsequent mental health challenges. It is very much a growing area that is being well recognised by most research institutes and universities, and they are getting a lot better at providing support. There is a wellbeing initiative within some of the national bodies to try to support staff and talk more openly about the need for wellbeing and access to things like employee assistance programs for people to talk through the challenges that they are facing. I think that is a really important part of recognising the challenges of working in this industry.

DI EVANS: Could I just make a comment there as well? I think this is why replacing animals is so essential. It is not just about reducing the numbers and reducing impacts on animals; there is also the benefit for people as well. If you take animals out of the equation and increase your uptake of alternatives, it resolves a lot of issues.

Ms ABIGAIL BOYD: Thank you. Ms Ward, in your opening statement you referred to the potential inertia within the medical research industry in relation to changing the way that we do things. Do you think that stronger regulation or government funding, or both, is required in order to push along the development of better alternatives to using animals?

TARA WARD: Yes, I would agree that both—the more the better, in terms of incentives. I have experience on a personal level as a category C, which I think is the right category—the animal welfare category—on an animal ethics committee. I think it is fair to say, at least from that experience, that the status quo is absolutely entrenched. There is very little evidence of moving beyond that, so external incentives are required. That could be as little as changing the way protocol forms are drafted, to force researchers to give more than just standard words: "We have to use animal models now because there is no alternative, but we are monitoring the literature." The problem is that if everybody says that, nobody is going to be looking into moving beyond that. I think in our submission we suggested changes to the legislation. Even going with the Animal Research Act as it is now, we know that that is being reviewed and maybe merged into a broad animal welfare Act, so we suggested changes that again would force researchers to turn their minds to it and make them deal with the issue more than just ticking a box and using standard words in their response. Otherwise, from my humble perspective and experience, I cannot see that really it is going to change.

The Hon. WES FANG: Thank you to the four witnesses, who have made themselves available to appear today and provide their submissions and some answers to the inquiry. Ms Ward, I wanted to start with you. I was noting in your opening submission that you indicated that the ADO supports non-animal alternatives in testing. We have heard today that there really aren't suitable non-animal tests to achieve the results that the researchers are able to do with animals. Are you able to provide us with some examples where non-animal testing can actually do that?

TARA WARD: Do what, sorry?

The Hon. WES FANG: Substitute for animal testing in research.

TARA WARD: As my colleague Ms Margo said, we are solicitors. We are not scientists. We are not researchers. What we would point to, though, is evidence from other jurisdictions that are moving towards—and are so much further along this path than we seem to be here in Australia—non-animal alternatives.

The Hon. WES FANG: I understand that position—"We are solicitors; we are not researchers"—but you have put forward a proposition. We have heard evidence today from researchers who said that their research cannot be achieved through non-animal means. The proposition that you have put forward is that you do not support that. In the research you have done to support that position, what testing have you been able to identify that can replace the tests that are currently done using animals?

TARA WARD: I would direct the Committee to experts in this area. I think some of the other submissions pointed to—that there is relatively little work in this space here in Australia. We do not have that ready expertise, but there are experts out there. I would certainly defer to them. I think this is also the problem:

We are getting the view that there are no alternatives from researchers. This is what I alluded to before. Researchers have developed their career in using animals. I cannot get across to you enough from a layperson's perspective how entrenched this is. Because their careers are staked on this, they cannot see beyond that, or will not. There is just no incentive for them to do that. They have been able to build a career on that, so where is the motivation to move beyond that? I would maintain, from an ethical perspective, that we need to do that.

SARAH MARGO: May I add to this?

The Hon. WES FANG: You can. I will come to you with some further questions in a second, Ms Margo, but I just wanted to keep addressing Ms Ward for the moment. The issue that we have here is that you say, "Ask the researchers." Well, we have just had three of the most pre-eminent researchers in the State come and give testimony and say that what you are proposing is not feasible. We have done exactly the things that you have asked this Committee to do. The evidence is that it is not achievable.

TARA WARD: With respect, I would suggest that you talk to the experts—

The Hon. WES FANG: I have not finished yet, Ms Ward.

TARA WARD: —in the non-animal alternatives.

The Hon. WES FANG: Ms Ward, you cannot—

The CHAIR: Order! We need one person talking at a time. I think the member is getting to the question.

The Hon. WES FANG: Ms Ward, you say that non-animal alternatives are to be supported. Does your office support the use of animal testing where human life is at risk and there is no alternative to animal testing?

TARA WARD: From our perspective, this is all about where we draw the line. As a human society, where do we draw the line? I could reverse or flip that question and say, "We could get to the human health outcomes that we want or that we consider to be achievable if we could experiment on humans." Rightly, we do not do that, for ethical reasons. We are prepared to do without those quick and probably much more appropriate advancements by choosing not to conduct that kind of experimentation. For many who are concerned about the use of sentient animals who have not consented to this kind of experimentation, there are serious ethical concerns about this that are not justified and cannot be justified from a utilitarian balancing act. Just as we draw the line and would not experiment on humans in that situation, even if it guaranteed a quicker and better outcome, I would say that we do not experiment on any sentient creature where we have not got their consent. If we have their consent, that is fine; a lot of the ethical issues are resolved. If we adopted that as a society, you would find that we would have a plethora of alternatives that would enable us to achieve those human health outcomes.

The Hon. WES FANG: In that instance, I am going to presume that that answer meant that under no circumstances would your organisation support animal testing. Would that be a fair assumption?

TARA WARD: No. I think we have a model already for the use of sentient creatures who cannot give their consent, and that is where research is conducted on humans who cannot give their consent. We are talking about minors or people who otherwise are mentally incompetent et cetera. There is a model out there. There are guidelines for conducting research on those humans. We would say that is a perfect model that could be used for conducting research on any sentient creature who cannot give their consent. I think research is conducted in those circumstances on humans, so it is not to say that it just would not happen. It does happen, and that is a perfectly good model that is already in use.

The Hon. WES FANG: I do not know what to do with that answer, so I am just going to let that one go and go to my next point. Is it not a little bit disingenuous to have in your submission a raft of suggestions, recommendations and ideas to change the way we conduct animal experimentation given that, in effect, your organisation does not support it?

TARA WARD: No, because we are realistic. I think this is one of those attempts to—animal advocates are always trying to be caught out by saying, "You want to ban something overnight." We are certainly not suggesting that. We acknowledge that the use of animals is entrenched. We also acknowledge that it has produced positive human health outcomes; we are certainly not denying that. But what we are proposing is that we keep a firm, humane and ethical objective that we phase it out and that the necessary steps to transition from these—let's face it, antiquated techniques—are ultimately phased out. It is not that we replace it with nothing, but that we develop those alternatives that are out there, the literature tells us, and are being used and are being validated.

The Hon. WES FANG: Do you understand community concerns that you are effectively trying to have your cake and eat it too? You have a position that we should ban it, but at the same time you have effectively indicated that you accept that it is going to happen. I cannot reconcile those two positions with your submission

and your answers. What is it that you accept as a threshold for which animal testing for medical purposes is permitted and where it is not?

TARA WARD: Thank you for the question, and welcome to our world as animal advocates. This is a common ethical dilemma that we face on a baily basis. As animal advocates, we may be ultimately wanting to achieve the end to harmful practices involving animals, but there is a big spectrum as to where you position yourself as to how you are going to get there. As a legal organisation we are inherently conservative or cautious, and we acknowledge that we are not going to get there overnight.

The Hon. WES FANG: "Conservative" is probably not the word I would have used.

TARA WARD: We look at how we can reach that ethical objective in a realistic way. We are not saying that we have all the answers—far from it. As I say, this is a dilemma we deal with on a daily basis. But we are proposing that we can get there. Other jurisdictions have adopted that as their explicit objective. New South Wales should be doing likewise.

SARAH MARGO: To add to what my colleague has said, I would just like to say that I think this harks back to or echoes what has been mentioned already in today's hearing. We really need this culture shift and attitude change. Many jurisdictions overseas have already accepted that alternatives are the way of the future, regardless of how long it takes us to get there. In terms of moving towards that, what we need to see in New South Wales is investment and dedication and funding in the alternative space. Back in the late 1980s we had a Commonwealth Senate inquiry into animal experimentation, and the recommendations of the committee for that specific inquiry were that we need to have dedicated funding for alternatives and a centre to that effect.

That was the late 1980s, over 30 years ago, and we have not seen that kind of funding to date. The sooner we start committing funding and embracing this industry, which really has incredible potential and I think would be very exciting and would be economically interesting, providing new technologies and workforce—the sooner we embrace that avenue and move towards that, the sooner we are going to have alternatives available. Ultimately replacing animals in research—if it is something that may not be available today, it is certainly something that seems to align with what has been said by everyone who has appeared today. Those who work in the space have acknowledged how positive it is where animals can be replaced. Essentially, there is no real reason to resist shifting towards alternatives, and that is the direction that other jurisdictions overseas are taking. That has a lot of potential economically, socially, scientifically and ethically.

The Hon. WES FANG: I could not concur more. However, the evidence we have heard today from not only the researchers and scientists who appeared but also advocates like yourselves has been clear: In the future we may be able to move in that direction but we are not there yet. We are not in the position at the moment to be able to achieve things like a COVID vaccine in a time frame which has saved millions of people across the world because of its earlier deployment due to the testing regime which was employed on it. I am unsure what you are hoping is progressed here, because all the evidence was that that is what these researchers wanted to do. They wanted to get to the point where they were able to do this without the need for animal testing, but we are not there yet. In that instance, do you accept that at the moment we are not there yet and that we require animal testing—that things like the COVID vaccine would not have been delivered in the time frame it was without animal testing, and that it has saved millions of lives? Anybody can answer that one.

SARAH MARGO: Sure. Thank you for the question. I would say that if alternatives are not available immediately, it is incumbent upon the Government to make sure that alternatives are invested in so that they are available as soon as possible. I do not think that we can use the premise that a vaccine that was developed with both animal and non-animal methods sets the precedent for how we go forward with this. I think that phasing out and working towards a different reality of testing is not at odds with how we currently operate. We can absolutely move towards reducing our reliance on animals, regardless of what the status quo right now and today is.

The Hon. WES FANG: The issue, though, is the lack of technology. While we can send somebody to the moon because we have done it before, we cannot send somebody to the sun. In the same way, I do not think any amount of government money would make us able to research medicine or a treatment that would substitute for animal testing, because that technology does not exist. That is the evidence that we heard today. It just does not exist. So I do not think it is a failure of government; I think it is a failure of understanding the limitations of science. That is where I have this great concern about the position that you are taking, but I notice my time has expired, so I will offer it back to the Chair to pass the questioning on.

The CHAIR: Thank you all once again for joining us this afternoon. The question has been posed or the statement has been made about the need for a significant culture shift. A witness earlier today used analogous language about the need for a paradigm shift in the way in which we think about animal experimentation. A counterpoint position put by some of the researchers who gave evidence earlier today was that the nature of

medical science is that, in terms of research, it is continually evolving. From their point of view—and I presume that they are putting the position that they firmly believe—they do wish to move away from animal experimentation as far as they can and as quickly as they can. There does not seem to be any attempt by them to say that they do not want to proceed down that track.

The point I am making is that, in a sense, are we not seeing a shift take place in the way in which we are looking at this, particularly with the advent of technology? I am talking about raw computing technology and, I presume in the relatively near future, quantum computing technology, which will enable research methodologies and modelling to be done at levels we do not possibly grasp. But at least for the time being, until we can get to this point of substitution—and I think it is being argued by yourselves that we should be able to substitute to non-animal research experimentation—we still do need to rely on animals to progress research in important areas of health and science. I am struggling to—

SUZANNE FOWLER: Can I make a comment on that? I think it builds on the last topic that Tara was speaking to. Yes, we acknowledge that animals are absolutely necessary at the moment in certain pathways. The problem is that there is a sincere lack of incentive for those very researchers you spoke to earlier today to work out, "Is there truly an alternative in this?" They might go, "Can I do this immune study without using an animal?" And they go, "Well, no. It's an immune study. I need the entire animal to be able to do this; therefore, that is my answer on the ethics form and that is how I am going to proceed." At the moment, there is no incentive for us to say to a researcher, "Actually, there is this new study that was done overseas, where it is well funded, and I would like you to do a parallel study that uses the animals and uses this new methodology, and see if you can get the same results or the same amount of data out of this."

At the moment, their funding is given to them by the NHMRC to do an animal model based on what their years of experience is based on. As Ms Ward alluded to, there is a real lack of incentive for them to change what their entire career has been based on, because they get very limited funding. Again, that was acknowledged by the researchers earlier today. They have to use that very cautiously, so they make sure they do what they know they can do and what they have published on before, so they can build on prior knowledge, which makes a lot of sense. But unfortunately that means that there is no look beyond their blinkers to say, "Actually, maybe I could do a systematic review," or, "Maybe I could invest in big data and look at very large cohorts of human data to see if there are results I could get there." There is no incentive and they do not get funding to do that type of work.

In Australia, there is not really a culture to go, "You know what? There might be a better way. Maybe there is a better way." I think that is the culture change that we are all referring to. We need a big push and a big incentive and a massive jolt for this industry to go, "You know what? We can't keep doing it that way. Maybe I need to do a parallel study, which still might use animals, but I could validate that organ-on-a-chip technology or micro-organoids could get me similar results or could give me the same building blocks to build knowledge on." That is very costly. If you get $1,000 to do an experiment—it is a lot more money than that, but let's just use a round figure—you are going to spend it on what you know and what you have built your career on. You are not going to diverge.

The CHAIR: That is your assertion, but the witnesses we have seen today, and others who have provided submissions from their respective organisations, do not strike me as particularly parochial or narrow-minded in terms of the way in which they are looking to try to advance their research. The world and science is connected instantly these days, and these researchers obviously are aware of research that is being done elsewhere in the world that is similar to, or perhaps even identical to, what they are doing. You are surely not submitting that researchers here are relying on animal research as a way of advancing medical science because that just seems to be the easiest way to proceed in Australia. Is that your submission?

SUZANNE FOWLER: I think that oversimplifies my argument. I am certainly not speaking to the three researchers you had on the panel. I do not know them, I have not read their ethics applications, and I am not sure of what process they have gone through to determine why they need to use animals for their particular research. From my experience and my knowledge, it is very difficult to get some research groups to change their way of thinking and to alter their research pathway once they have made a commitment to a certain way of working, which is using animals.

The CHAIR: Can I put this back to you in back-and-forth questioning? These three researchers who gave a panel presentation this morning—and there was one earlier who gave evidence by himself—are quite well known and are quite eminent medical health research people in Australia, particularly in New South Wales. If you are not familiar with their work and with the way in which they go about undertaking research and supervising research, you are hardly in a position to make a generalised statement about the way in which they are conducting their research, are you?

SUZANNE FOWLER: I just clarified that I am not talking about those three individual researchers or the one that you had on earlier today. I am talking about more of a culture of change that I think is needed in the Australian industry. Di, you had your hand up to perhaps intervene.

DI EVANS: Yes. If I could just add another comment, it is not just the purist research that is being done that creates these difficulties in changing the pathway. It is also the regulatory testing. What we find quite often is that even if you have a desire by researchers to opt out of using animals, they cannot get products registered—for human use, in particular, but it is the same for animals—without having that base animal testing. It is really important that we look at both streams simultaneously so that they can come together and go forward together, otherwise they are out of sync. I have been involved in looking at the regulatory side, mainly for ingredients used in cosmetic testing, and that is a good start. This is the other part of the whole landscape that we need to consider in order to progress this. It is not just saying that the researchers are unable to go forward; there are the government regulatory requirements, as well, for being able to register different therapeutics.

The CHAIR: I understand the answer to that. I do not know whether it was a throwaway line, but an earlier statement was made with respect to these eminent researchers—I do not think specifically the ones in the room, but medical research in general—that they built their careers on this. In other words, this is all they know. They know nothing different. The implication is that they are slavishly following what has been done in the past. In fact, the language that has been used is "antiquated research methods". I have to say, with the greatest respect, that from the description of what we got this morning from a total of four quite eminent researchers, it certainly cannot be construed at all that the research methods they are using are antiquated. In fact, it strikes me—I speak for myself only—that it is quite cutting edge.

SUZANNE FOWLER: And I think you will find that there is quite a continuum—there has been a discussion about the continuum today—of where different researchers are with that progression. I think there are different types of research. The point I was trying to make is not about individual researchers. It is much more about the system in Australia not supporting even those who do want to perhaps consider alternative methods. There is a significant lack of funding and so much competitiveness in trying to get research funding that they cannot necessarily get their hands on alternative methods, even if they want to, both because of the lack of funding and because of the regulatory requirements, as Di said. There is a significant lack of incentives.

You will find that the NHMRC did a review a number of years ago—I cannot remember when specifically—about the potential blockers and enablers in using the three Rs. Lack of funding was a significant part of it. Trying to control your research so that you can build on previous research was another potential blocker. That is my point. I really think that for change to happen there needs to be significant investment into making sure that people feel that they can go down the path of looking at alternatives—and not just alternatives. I also think there are blocks for trying to do refinement, because if you say to someone, "There is a pain relief that you could use to make sure that the research is not of such a high impact to the animal," they need to validate that the pain relief is not going to change their results. They need to do a side-by-side study, and that is going to cost them more money with limited access to grant funds. And so, to make this sort of change happen, you need to give incentives to researchers to do so.

The CHAIR: Thanks, Dr Fowler. Well, time has beaten us. It has just gone a quarter past and we need to move to our next witness. On behalf of the Committee, I thank you all for the very comprehensive submissions, which do not just contain a lot of detail but are well annotated for a lot of referencing that can be done. Thank you for your frankness in your evidence today. I appreciate it very much. There may well be some supplementary questions that will arise once members have had a chance to read the transcript. If you are agreeable, our Committee secretariat will liaise with you over the supplementary questions and to organise a time frame, usually about 21 days, to return those supplementary questions in due course. Once again, thank you for making your time available.

(The witnesses withdrew.)

Ms LISA CRAIG, Private individual, before the Committee via videoconference, affirmed and examined

The CHAIR: Good afternoon and welcome, Ms Craig, to our inquiry. Before we proceed, just to confirm, we have two submissions from you.

LISA CRAIG: That is correct.

The CHAIR: Rather, there is one in an original form and there is a part A. The original one is submission No. 251 to the inquiry.

LISA CRAIG: Yes, I have that.

The CHAIR: Okay. That is the one that we are going to be specifically referring to in our questioning back and forth with you this afternoon. The Committee is made up of representatives from the Opposition, the crossbench and the Government. We will move between the three groups to ask questions of you and provide you with an opportunity to answer those questions. I also understand that there has been some discussion between you and the committee secretariat over confidentiality on certain matters. Do you understand what has been explained to you?

LISA CRAIG: Yes, I do.

The CHAIR: Thank you very much. We will get proceedings underway and commence with the Deputy Chair.

The Hon. EMMA HURST: Ms Craig, thank you for coming to give evidence today.

The CHAIR: Sorry, I should have invited you to give an opening statement. I rushed straight into it without thinking. I invite you to make an opening statement, if you wish.

LISA CRAIG: Yes, I would. Thank you. My name is Lisa Craig. I have been directly involved in animal research since 1992. I have worked extensively in the US and Australia in academia, industry and government. I am a strong believer in the value and benefit of animal research in medical and veterinary medicine, and that we are not yet in a place that animal models can be replaced in all instances. However, it is of utmost importance that when animals are used in research it is done with the utmost care and respect for the animals and their welfare. Beyond the three Rs, this includes the importance of expertise in laboratory animal science, the science dedicated to the humane care and use of animals in research. Lab animal science in medicine includes veterinarians, paraprofessionals and other professionals with expertise not just in animal care but in managing the biologic variability inherent in animal models that is critical to the quality of reliable and repeatable research.

Unfortunately, professionalism in lab animal science in Australia is lacking. That includes access to lab animal science in medicine education. Australian regulations leave the authority and responsibility for animal care and welfare with the chief investigator. Veterinarians, paraprofessionals and professional lab animal science involvement in research is not prioritised and research is over-reliant on researchers who lack expertise in animal care and welfare, including the principles of lab animal science in medicine. Even the Animal Research Review Panel does not include expertise in lab animal science in medicine, nor representatives from those of us directly involved in the daily care and management of animals for research.

I want to direct your attention to the Orima *Survey on the replacement, reduction and refinement of the use of animals for scientific purposes in Australia*. This survey was commissioned by the NHMRC and involved investigators, animal ethics committee members and institutional representatives that were responsible for governance. Not one animal welfare officer or staff member directly responsible for the care of research animals was involved in this survey. The survey demonstrated not only the lack of importance and authority assigned to those people with experience and expertise in animal care and management but highlighted the over-reliance of self-government and management; and the AEC and researcher over-reliance on each other and the granting authorities in determining the appropriateness of research, the ethical implementation of research and the application of the three Rs.

It is a significant deficiency in the management and care of animals in research management, and the control of variability in animal research in Australia. This includes the implementation of the three Rs in the development of experimental protocols and procedures. This gap must be filled to ensure animal care. Animal care and welfare must be in the hands of those with appropriate training, education and experience and be able to provide proper, rigorous management and monitoring of biologic variability, including genetics and microbiome. Those issues are critical to ensuring the repeatability of the quality of research in Australia as well as animal research. Thank you for talking to me today. I am happy to answer any questions about my submissions.

The Hon. EMMA HURST: Thank you for coming. Your submission raises some really extreme cases of animal welfare. You talk about animals having their toes and tails cut off, not being given proper analgesia, and being killed en masse because the data was not correct. Is this something that you have witnessed across a variety of facilities that you have worked at?

LISA CRAIG: There is definitely a range of facilities. Some institutions are much more inclined to do the right thing. Other institutions are quite questionable at times. There is a wide range of ethics committee processes and procedures. Again, without proper authority in the hands of animal care staff it is very difficult to manage.

The Hon. EMMA HURST: Were there particular animal protocols that were most concerning? You use the word "horrific" when you are talking about smoke inhalation studies.

LISA CRAIG: Yes.

The Hon. EMMA HURST: For the benefit of the Committee, can you describe what you saw to use that word "horrific"?

LISA CRAIG: The forced inhalation study is of common concern, and I have extensive experience with those models. Animals have forced exposure to cigarette smoke five days a week. They are left two days a week in withdrawal. The particular model leaves animals hypothermic, wet and in significant distress between cigarettes. Generally those animals are smoked twice a day. Those models are horribly unreliable. In many instances, I have seen those animals culled en masse when the researcher has decided that the progress of the study is not going the way they expected or intended.

The Hon. EMMA HURST: Do you know what facilities are conducting those sorts of experiments?

LISA CRAIG: I do not offhand at the moment, no.

The Hon. EMMA HURST: In regards to the complaints that you made about animals having body parts cut off and analgesia, were there any investigations that took place in regard to those concerns?

LISA CRAIG: Toe clipping, tail clipping and taking tissues is a very common practice done in embryonic or young stages—within the first two weeks of life. It is very common, done under anaesthetic and considered generally humane. However, in those instances the animals were adults subjected to procedures that they were not approved. There was the suggestion that there was an investigation, but again there was no follow-through from that investigation.

The Hon. EMMA HURST: In regard to the over-production and killing of excess animals bred for research, how big of a problem was that where you worked? What happened? If you had to have a guesstimate of how many animals were being killed, what are we looking at?

LISA CRAIG: Everybody has heard a lot about AVR today, and AVR is an excellent institution, but a number of institutions are still ordering in animals from AVR and then proceeding to breed them on their side. They are ordering commercially available animals and breeding them onsite for two or three generations. In general with mice and rats, you end up with an excess prediction of almost 50 per cent or 60 per cent, at times. Sometimes it is less, depending on the needs, but it has been—

The Hon. EMMA HURST: Can you give us an idea about what that means in numbers? Are we talking about 20 animals being killed or are we talking about potentially hundreds of thousands?

LISA CRAIG: Yes, we are talking in the thousands at some institutions. Most institutions have moved away from that practice. But again, there are institutions within New South Wales that are engaged in breeding their own commercially available strains. They might get the original animals from AVR and breed them through two or three generations and then replace them again with animals from AVR. So we are talking thousands of animals. In addition, there are things such as guinea pig colonies and things that are generally not commercially or readily available. In those instances, we are talking about hundreds of animals that can be wasted.

The Hon. EMMA HURST: Are they killed with surgical dislocation and is the animal care staff given that as a responsibility?

LISA CRAIG: The animal care staff is generally left with that responsibility. In the case of guinea pigs, there was an attempt at rehoming. There was some significant rehoming, or at least giving them to pet stores, in the past. I do believe those practices have stopped and all those animals are now being culled.

The Hon. EMMA HURST: In regards to some of the welfare issues that you have seen, what are some of the worst things that you have witnessed in your time at different facilities in Australia?

LISA CRAIG: In terms of absolute welfare issues, there are many issues around care and management of animals that are not sufficient at some institutions—again, not all institutions. It goes back to facility support and training from the institution. Animal care programs are generally the last priority on the budget.

The Hon. EMMA HURST: When you say it is the animal care, we do not know what that involves because we are not working in that space. Give me an idea of what are the welfare implications?

LISA CRAIG: I have been engaged in institutions where previous staff have been neglectful in managing care of animals, or improperly trained, or lacked knowledge around the appropriate care of those species. That has resulted in things such as bumblefoot in guinea pigs or mouldy water bottles. There has definitely been a range of those things. I suppose, in terms of the ultimate—the most horrific welfare issues I have seen would come back to those forced inhalation and smoking models.

The Hon. EMMA HURST: For clarification, how many facilities have you worked at in Australia?

LISA CRAIG: I have worked with at least four and I am also—as an AAALAC ad hoc member, I have been engaged in some others.

The Hon. EMMA HURST: Thank you.

The CHAIR: Just for the purpose of *Hansard*, what is that acronym—the organisation?

LISA CRAIG: Sorry. It is the Association for Assessment and Accreditation of Laboratory Animal Care—AAALAC. It is a voluntary international accreditation program.

The CHAIR: Thank you. We would not know the acronym, for *Hansard* purposes.

Ms ABIGAIL BOYD: Good afternoon, Ms Craig, and thank you for your very useful submission. You say that you have worked in four facilities in Australia. Is that in New South Wales or in Australia more broadly?

LISA CRAIG: In New South Wales and Queensland.

Ms ABIGAIL BOYD: And you previously worked in the United States?

LISA CRAIG: I previously worked in the US, yes.

Ms ABIGAIL BOYD: How many facilities did you work at in the US?

LISA CRAIG: I was the director of animal research at the [inaudible] centre at Johns Hopkins University. I worked with a number of institutions at NIH and was the training and compliance manager for a contracting company that covered 17 of the NIH programs. I have worked for a big pharma. I have worked at the universities. I did my graduate work as well with animals and animal models.

Ms ABIGAIL BOYD: So you have a pretty good insight then, you would say, into the difference between the average US facility and the average facility here in New South Wales?

LISA CRAIG: Not just the difference but also the evolution of animal management and animal programs throughout the years.

Ms ABIGAIL BOYD: Is it your evidence that the standard of animal welfare in our medical research facilities in New South Wales, far from setting the world standard, is actually poorer than in the US?

LISA CRAIG: At least in some of the facilities that I have been in. There is quite a much more extensive diversity and range in animal programs and animal care in Australia versus that that I have encountered in the US. I have encountered things in Australia that I have been quite shocked by, I suppose.

Ms ABIGAIL BOYD: One of the things that we explore a lot in these animal welfare related inquiries is the concept of having an independent office or an independent person who ensures that animal welfare is being met—independent from the interests of the people who are using the animals in the first place, whether that is agriculture or anything else. In your submission you talk about there being a lack of independent oversight when it comes to welfare in our facilities in Australia.

LISA CRAIG: Yes.

Ms ABIGAIL BOYD: How is that different in the US?

LISA CRAIG: In the US, for one, the US regulations require that a veterinarian—that appropriate veterinary care or adequate veterinary care is in place at all institutions. The veterinarian has the ultimate authority for animal welfare and responsibility. The veterinarians are much more engaged and involved in the development of the procedures and protocols around animal use. The veterinarians are much more involved in the ethics or animal care and use review programs. There is extensive staffing and expertise in live animal science and

medicine, so animal facility managers may have a masters degree in laboratory animal science. Those programs are just simply not available in Australia. Veterinarians in the US may have much more extensive training and education and experience of live animal science than our average welfare officers.

Ms ABIGAIL BOYD: So in New South Wales it is the primary researcher who has responsibility for ensuring animal welfare outcomes. Is that right?

LISA CRAIG: That is correct, and animal care and management practices. So one of my struggles as an animal facility manager is that I do not have authority to determine how animals are managed. It is the researchers, and it requires researcher approval to determine the care and management of the animals. So if I say a cage should be changed every two weeks and the animal researcher says, "No, it should be changed once a week", then I have to allow that researcher's requirements.

Ms ABIGAIL BOYD: Are you able to give us an example of when what a researcher is trying to do with their research, on one hand, and an animal welfare ideal—or what they should be doing from an animal welfare perspective—on the other come into conflict?

LISA CRAIG: Absolutely. One example is sanitation quality control practices within the facilities and allowing the proper use of sanitation agents and disinfection within facilities. Microbiome has become a huge issue and there is this huge idea that if we use disinfectants in the environment the animal is going—it is going to change the environment, it is going to change the animal's microbiome and it is going to impact the research. However, it is absolutely the opposite. We need to have those sanitation programs in order to reduce pathogens and ensure the health and welfare of those animals. Other examples come back to feeding, water quality, bedding changes, changes in cage numbers.

Mice do not like their cages changed. They are very olfactory and scent-driven. They have scent markers, so it is really best to delay those cage changes as much as possible. But a researcher looks at it and says, "They're dirty. They're eating their faeces." Well, yes, that is part of being a mouse. So there is a lot of conflict in what a researcher believes is the appropriate care and management but what actual science says is the appropriate care and management of an animal in research. It is not your pet; you cannot change the food and water as you see fit. That does have significant impacts on the variability of the experiment and the ultimate outcomes.

Ms ABIGAIL BOYD: Thank you.

The Hon. CHRIS RATH: Thank you for your evidence so far. I think a lot of people would be quite surprised or confronted by some of what you have said. Is it an issue of current regulations or laws not being enforced, or is it new regulations or laws and protections that need to be put in place, or a combination of the two?

LISA CRAIG: I think it comes down to absolute inadequacy in regulations. First of all, institutions are self-policing. There is no incentive for an institution to police itself. There is no mechanism for animal care staff or other staff to make complaints against a researcher or against a practice that they have seen. There is a lack of training in [inaudible] animal ethics committees and there is also a good deal of fear. It is like, "Well, if I block that protocol and suspend that researcher, then we have lost funds and it is a risk to the institution." So there is a lot the legislation lacks in terms of those policies and procedures that incentivise researchers to manage their programs appropriately.

The Hon. CHRIS RATH: In your opening statement you said that, obviously, we cannot ban animal testing overnight. I think, from everything that this inquiry has heard today, we are in a situation where pretty much everyone agrees that eventually, hopefully, we will be in a position where we will not have to test on animals, but at the moment it seems like it is not feasible to immediately ban it overnight. What sort of time frame do you think—or how far along is the science? What sort of horizon would you say we could do that in? I know that is probably a difficult question, because it is "How long is the piece of string?"

LISA CRAIG: That is an impossible question [inaudible]. The science has been so—it has taken leaps and bounds and there is so much change every day that we could find that in 10 years we have eliminated it. We might come up with something tomorrow that, you know—it is really asking for 20/20 hindsight that I just do not have. I think there is significant investment overseas in those alternatives but that is one of the problems in Australia. We are not investing in alternatives at all. Well, that is not true. The University of New South Wales now offers a grant in alternative methodologies, but there is no support for it through the NHMRC or any other mechanism in Australia.

The Hon. CHRIS RATH: Do you think with our scientists and researchers that they would probably view it more as a necessary evil rather than something that they particularly enjoy doing? It is not like they want it to continue in perpetuity because of some ideological principle that they have. It is more just that they see the medical benefits that it provides and they think that phasing it out too quickly could potentially harm their research.

LISA CRAIG: Quite frankly, I have yet to meet a researcher who likes to come down to the animal house. I think that they would all prefer to move away from animals if they found that feasible. They may lack the resources and the funding to do that at the moment. I have yet to come across a researcher who thinks that we should just keep doing the same.

The Hon. WES FANG: Thank you for appearing today and offering to provide some evidence to the inquiry. I want to start with some of the evidence that my colleagues have already taken you to today about what you have witnessed inside some of the facilities. What actions did you take when you became aware of some of the issues that you have addressed in your submission, No. 251?

LISA CRAIG: I have submitted the adverse event and contacted animal welfare officers. In one case I resigned from the role [inaudible].

The Hon. WES FANG: What was the outcome of those circumstances?

LISA CRAIG: No change. In fact, I would say negative change. The institution that I resigned from is now being run from Adelaide by a—the program oversight is not even on the campus. They no longer have any expertise at all.

The Hon. WES FANG: The evidence you provided was not substantiated or not upheld?

LISA CRAIG: I was asked to do a program review for the institution, which I did complete. I gave it to the DVCR. He then resigned and that went nowhere.

The CHAIR: Sorry, just for Hansard, the acronym?

LISA CRAIG: The DVCR is the Deputy Vice-Chancellor for Research and Innovation.

The Hon. WES FANG: The review that you did had examples of the issues—I will not go through them—that you identified. That led to the resignation of that person yet you still say that it had a negative impact?

LISA CRAIG: Yes, there was no change instituted based on that program review. It was summarily dismissed and that—

The Hon. WES FANG: Okay. Sorry, go on. There is a delay with Webex, which always creates a problem.

LISA CRAIG: It was summarily dismissed and that program was never changed. In fact, six months later I was still getting urgent phone calls for issues to deal with as the program coordinator.

The Hon. WES FANG: In that instance, were you in possession of or able to access documents, photos, or documentary evidence that you could then take to other organisations such as the Animal Defenders Office or the RSPCA, the two organisations we heard from prior to you?

LISA CRAIG: I have not submitted them to those organisations. However, that is part of the reason that I am here today. I did bring that to the Animal Justice Party and did have discussions with that party around my recommendations for changes in the legislation and—

The Hon. WES FANG: Sorry, just before we go any further, you are saying that before this parliamentary inquiry, you have contacted members of this inquiry with evidence and—

LISA CRAIG: Not with the evidence per se, but this is what brought me to become more involved with the legislative changes, with the Animal Justice Party, with—

The Hon. WES FANG: Are you a member of the Animal Justice Party?

LISA CRAIG: No, I am not.

The Hon. WES FANG: Have you been contacted by or have you spoken to any of the members on this inquiry about this inquiry prior to giving evidence today?

LISA CRAIG: I spoke to one member about two years ago about the issues I was having, not about my submission today.

The Hon. WES FANG: The issues that you identified were not upheld. You have brought it to the Animal Justice Party and given that evidence to them. You have then come to this inquiry—

The Hon. EMMA HURST: Point of order: She said that she has not given the Animal Justice Party evidence. What she has said is very [disorder].

LISA CRAIG: I contacted the Animal Justice—yes. At the time I was trying to find a way because what I have found in Australia is there is no national oversight and there is no State oversight. When I wanted to bring that to a legislator or to the ARP, for instance, there was no mechanism for me to take it outside of the institution and have an investigation completed because there is no oversight.

The Hon. WES FANG: I have noted [disorder].

The CHAIR: Order!

LISA CRAIG: Sorry. I contacted the Animal Justice Party for information on what to do, where to go next and how to become more involved.

The Hon. WES FANG: I noted that you feature in a newspaper article that was published online probably about an hour or so ago featuring some of those claims, yet you have not taken them to somewhere like the Animal Defenders Office, RSPCA or the like. Why have you not done those things? Why have you only used it now in this inquiry?

LISA CRAIG: I have talked to reporters about them. Again, it is very difficult in terms of reputational risk. Obviously there is a lot of reputational risk involved.

The Hon. WES FANG: There is a lot of reputational risk, I suspect, taking it to a newspaper before an inquiry and not dealing with it through the proper processes.

LISA CRAIG: I actually did not take it to the—I was contacted by the newspaper because I had been the previous manager at an institution that had run those studies.

The Hon. WES FANG: You can understand the issue I have got here. You have raised a number of issues, both ethical and animal treatment issues. They have been dismissed when they have been investigated and—

LISA CRAIG: They were not investigated, and that is the problem. There was no investigation.

The Hon. WES FANG: They have not been upheld, let me put it that way. Instead of raising it with animal welfare organisations or the like, you have put it here where it comes under parliamentary privilege. You can understand my concern that they have not been addressed properly.

LISA CRAIG: I can address that. Taking it to Animal Defenders or the RSPCA is not an effective means to manage the situation.

The Hon. WES FANG: I could not agree more.

LISA CRAIG: They do not have the authority—

The Hon. WES FANG: They are ineffective organisations.

LISA CRAIG: They absolutely do not have the authority to investigate the institution unless the institution allows them. Had they done that—I mean, if we were in the United States—

The Hon. WES FANG: But neither do we.

The CHAIR: Order!

LISA CRAIG: But the legislation needs to change. That is where the legislation needs to change. In the US there is legislation that allows people to go to the animal welfare office or different organisations that then have the authority to manage that. In Australia that is lacking. In Australia, that is the institution itself.

The CHAIR: I have got a few questions that will take us through to the end of your session. In terms of the matter of care and management of animals being used for animal experimentation, you said in your opening statement that you have concerns about what you have observed about what the levels of care and management are. I presume that is based on your experience working in those four facilities in Australia?

LISA CRAIG: That is correct.

The CHAIR: Could you elucidate on what your observations are that have caused the concern about the care and management?

LISA CRAIG: Yes. My concerns are not about the actual care and management, but where the care and management authority sits. The care and management authority and the authority for animal welfare currently sits with the chief investigator of a research project. That investigator has no expertise in animal care and animal management, or husbandry. There is no independence, there is no veterinary involvement, there is no paraprofessional involvement. So the expertise in care and management of animals is missing in those situations

and, as I alluded to earlier, often times where there is expertise—say, in the animal care staff or the animal care management—it is not deemed necessary and that person does not have the authority to ensure animal care and welfare decisions are made appropriately.

The CHAIR: I am trying to get this clear in my mind. I understand from a structural point of view you have said that there are certain people in place that have certain responsibilities with respect to animal care and management. But what is the level of animal care and management like in our institutions that undertake animal research, from your experience across the four organisations you have worked for?

LISA CRAIG: It is quite underfunded and under-supported. We lack the resources. We are often understaffed. It is difficult to find staffing, and staff with training and qualifications. The TAFE program in New South Wales is gone, so where do you get animal care staff that have any training in animal care? So we are bringing them in and we are training them on the ground, and it is difficult.

The CHAIR: I am still not quite clear in my mind. I am not looking to argue with you. I understand the points you make about specific positions not being in place or the oversighting of animal care and management. But, just as a general statement, what is the level of animal care and management in our institutions? I am just trying to grasp that.

LISA CRAIG: It is quite basic. I mean, it is quite basic. Animals are getting appropriate care but not necessarily getting appropriate control of intrinsic variability. There is a lot of variability in facilities—so, one facility might use an acidified water system, one might use a chlorinated water system. There is a lot of variability in what the staff does. Some institutions, they borrow a lot of students—postdocs and graduates—to perform animal experimentations. And they have technical staff with that expertise that is doing it day in and day out and has the training and expertise in injections or surgery or manipulations. They are replacing the researchers—the students and the free labour that researchers use—but that is not often the case, because it is expensive. There is a difference between hiring somebody with technical expertise to perform your animal experiments and getting a postgraduate student or an honours student to give free labour.

The CHAIR: Can I just move over to some observations about the United States? You have described your experience in the United States. Is it your evidence that the way in which animal experimentation is dealt with in the United States is at a discernibly different and higher level of quality and standard than in Australia?

LISA CRAIG: Yes, absolutely, and much less variability between institutions.

The CHAIR: Why is that so, in your observation?

LISA CRAIG: Much more prescriptive legislation, as well as the involvement of veterinarians. The United States requires veterinarian involvement in research; the Australian legislation does not. Even the AEC member is not required to be a registered veterinarian, only able to be registered.

The CHAIR: So is the role of the veterinarian in Australia essentially limited to membership of an oversight ethics committee? Is that your understanding?

LISA CRAIG: Yes. So the category D member, the veterinarian, in Australia their only delegated role is as a member of the ethics committee. But that veterinarian member does not have to have any experience, does not have to have ever practised, only must have the qualification that allows them to be registered in Australia.

The CHAIR: In your evidence you spoke about the need to "incentivise" matters to bring about change. I use the word "incentivise" because that was the word that you used. What do you have in mind when it comes to incentivising matters to bring about change? Do you have any particular examples?

LISA CRAIG: It all comes down to the legislation—the legislation driving change and that paradigm shift. But it also comes down to ensuring that there are available funds that people can use to develop new methodologies and techniques, to be engaged in refinement activities, to research causes of variabilities in animal studies. As I said earlier, in one of the studies I saw a number of animals killed because they were not providing the results that the researcher expected. Well, that researcher should be able to use the funds that they have to investigate the reason for that change in the results, not just to start all over. But there is no incentive there, because if they are not producing any research that they stated they are going to produce, the institution is not inclined to keep them on board or they will lose funding.

The CHAIR: Sorry, just explain that again. I may have misheard you. If they do not produce particular outcomes they need to—

LISA CRAIG: They need to investigate why. In one of the studies, the postdoc did not believe that the animals were gaining weight the way they should have. So, rather than investigating what was causing changes in weight gains, they just stopped the project altogether and started again—rather than investigating the causes

for those changes, you know, putting money into histology, putting money into pathology, putting money into genetic changes, looking at microbiome differences between groups. But funding is just not available for those investigations.

The CHAIR: What is your submission in terms of where the funding is going to come from? That is not a trick question, it is just a straight-up question.

LISA CRAIG: I think that when NHMRC funds grants that involve animal research, they need to have sufficient funding for the animal care, the animal research and the assurance of minimisation of variability. The NHMRC grant should come with the requirement that the researcher does some genetic monitoring of their animals, does microbiome monitoring of their animals, to ensure that the results are consistent and that they can then explain or investigate any inconsistencies. It is rigorous science, and it is expensive.

The CHAIR: That is time. I thank you very much, as the Chair and on behalf of the Committee. We appreciate you making the time available today. Your submission contribution was very helpful and the opportunity to question you today has also added to our knowledge. On behalf of the Committee, thank you very much.

(The witness withdrew.)

The Committee adjourned at 15:57.

IN-CAMERA **PROCEEDINGS BEFORE**

PORTFOLIO COMMITTEE NO. 2 – HEALTH

INQUIRY INTO THE USE OF PRIMATES AND OTHER ANIMALS IN MEDICAL RESEARCH IN NEW SOUTH WALES

RESOLVED TO BE PUBLISHED BY THE COMMITTEE ON 28 JUNE 2022

At Room 814/815, Parliament House, Sydney on Monday 16 May 2022

The Committee met in camera at 16:00.

PRESENT

The Hon. Greg Donnelly (Chair)

The Hon. Lou Amato
Ms Abigail Boyd
The Hon. Wes Fang
The Hon. Emma Hurst (Deputy Chair)
The Hon. Chris Rath

PRESENT VIA VIDEOCONFERENCE

The Hon. Walt Secord

* Please note:
[inaudible] is used when audio words cannot be deciphered.
[audio malfunction] is used when words are lost due to a technical malfunction.
[disorder] is used when members or witnesses speak over one another.

Resolved to be published by the committee on 28 June 2022

Evidence in camera by **WITNESS A**, , affirmed and examined

The CHAIR: [Witness A], on behalf of the Committee I welcome you this afternoon. We appreciate you making your time available.

We understand that you have sought and been given the opportunity to come along and give evidence this afternoon in camera which builds on and elucidates, as I understand, some of the material that is covered in your submission. We will now move on to the offering of an opening statement, if you would like to proceed with that. If you are agreeable to it, we will then move to questions from the Committee members, who will share that time between themselves.

WITNESS A: I understand. Thank you for the invitation to present evidence. I have worked in three separate areas of animal research.

If I was asked to give an opinion of the overall state of animal research in Australia based on my observation from these three perspectives, I would say that I actually think the regulatory framework is very good in principle. What concerns me is how it is being implemented in practice. True, some institutions make a very commendable effort to achieve best practice in both the spirit and the letter of the regulations, but overall I see deficiencies, which have concerned me increasingly in recent years. If I had to suggest a unifying cause, it is a weakening of the regulatory bodies charged with overseeing the regulations in this country.

I feel that certainly in New South Wales—I cannot speak with much authority about other jurisdictions. In New South Wales I feel the regulatory body—although the people themselves are doing their level best, I think it has failed in one of its most core responsibilities, which is the independent inspection of institutions as accredited animal research establishments. I assume that is a reflection of declining resourcing, but it is something that I believe is in urgent need of attention. As you said, Mr Chairman, I am willing to take questions and provide examples, if that is of assistance.

The CHAIR: Thank you very much. We will commence with the Deputy Chair.

The Hon. EMMA HURST: Thank you, Chair, and thank you, [Witness A], for coming. As someone who has worked in the research space itself, I wanted to get your thoughts around the nose-only smoking models, because we got a lot of submissions about that particular model. I wanted to get your thoughts about the scientific validity of these experiments and also the animal welfare implications of nose-only smoking models.

WITNESS A: I would probably regard that particular technique as having the highest animal welfare impact of anything I have seen, for two reasons. One is that it seeks to induce severe, chronic lung disease, which I understand is necessary for what it is trying to model. But it also combines non-experimental influences, including severe restraint and confinement. That, along with various other aspects of the model that is commonly used in New South Wales, raises significant questions about its validity.

I feel the original paper that described the currently used procedure falls short in terms of reflecting any sort of understanding of fundamental veterinary principles. For example, the model is advanced as one showing typical cardiac changes of some of the diseases that it is modelling and typical blood changes of some of the diseases it is modelling. But if you actually look at the data in those papers, they make no sense from a veterinary point of view. I think it is very problematic from a veterinary-slash-scientific point of view. In terms of animal welfare, I think its impact is extremely severe and could only be justified with absolutely compelling evidence of its utility.

The Hon. EMMA HURST: Obviously we are in camera, so this is just us talking. Should we be looking at a committee to stop those experiments from happening? We have been talking a lot about balancing animal welfare and human outcomes. Is it experiments like that that are falling through the cracks and that really are not being overseen? I guess I have two questions. What do we need to be doing on those experiments? Should we be advocating to end a couple of specific experiments and stop those? The second one is: If there are such validity questions around these experiments and they are still being approved at some facilities and not others, what is happening with the whole system that that is being allowed to happen?

WITNESS A: One of the problems with this technique is that if you look at the regulatory code, it makes it very clear that if there is a less invasive technique that can be used to achieve the same scientific outcomes then the less invasive technique should be used. We do have an alternative to the nose-only smoke exposure technique, namely whole-body exposure, in which animals are placed, often in groups, in a chamber. You avoid not only the welfare impact of the tight confinement or constraint, but you also avoid the uncontrolled scientific variables arising from the stress response. The animals will still be stressed in a whole-body chamber exposure method, but it will be substantially less than what would be occurring in the very tight restraints. I am sorry; I cannot remember the second question.

The Hon. EMMA HURST: The second one was—we have heard from researchers today that are saying there is great oversight, great transparency and a great process, and that none of these experiments would be approved or funded if they were questionable. But what we are also hearing from the other side is that some of these experiments do have a big question mark over their validity and do have a question mark over the welfare impacts. What is happening?

WITNESS A: I think things are falling through the cracks. Again to use the example of the nose-only smoke exposure technique, it has been approved for many years by an animal ethics committee. There are veterinarians on that animal ethics committee, and I cannot understand why they have not picked up on some of the fundamental flaws in the original paper that described the technique. Perhaps they only look at the document placed in front of them, which would be the application from the researcher. They do not necessarily have the time to go back to the primary literature. But if there was more opportunity or more pressure or expectation that people reviewing protocols did not take everything they read in the application at face value but were prepared to drill a little bit deeper and look at some of the primary literature, then I think those sorts of situations would not be occurring. That sort of thing would not be falling through the cracks.

The Hon. EMMA HURST: So there is a level of oversight within the entire industry that is not happening and that is allowing research projects that do not have a human health benefit, potentially, and have major welfare issues, like the nose-only smoking model. The other one I want to talk to you about is the forced swim tests, as well. Can I get your opinion about the validity and the welfare implications?

WITNESS A: The forced swim test itself, as you are probably aware, is scientifically contentious. The scientific community is somewhat split on that. Nevertheless, there is a correlation between the efficacy of some antidepressants and the outcomes of the test. What concerns me about advocates for that test is that they are invariably people from a scientific-slash-neuroscience background. Again, you do not hear accounts from people who have expertise in animal welfare science or veterinarians. If you look at , they recently put out a video explaining the test and giving reasons why they felt it was scientifically valid, yet one of the people interviewed in that video was a neuroscientist who said, "No animal has ever drowned in this test." How anybody can make a claim like that is beyond me. They are talking about a test that is performed all around the world. But it is actually not true, because I know of an instance where an animal drowned and it was proven by laboratory investigation. There is a concern about the expertise that goes into reviewing and advocating some of these applications, and I think there needs to be more time and effort put into asking deeper questions and not just taking the application at face value.

The Hon. EMMA HURST: One quick final question: Obviously you have come to us today in camera. I am not sure if you talked about whether or not we should be working to ban certain experiments or whether you would like to see that as a recommendation, but is there anything else that—the reason you have come in camera today. Is there anything else that you felt this Committee needed to hear that was sensitive?

WITNESS A: To your question about banning experiments, if we look at the regulatory code, the overarching code that is woven into the legislation in all jurisdictions, it is clearly utilitarian based. In principle, if a strong enough case can be made that a test should be used then approval should be given for that test. Under the existing code, which I do think is a good document I have always found guidance to navigate my way through it with the code. Short of revising the code, as things currently stand it would not really be consistent with the code to have an outright ban. However, there are other highly invasive tests that have special regulations around them: the use of primates, the LD50 test, the Draize test. At the very least, I would like to see the forced swim test and the nose-only smoke exposure procedure put in that same category.

The Hon. EMMA HURST: Is that ministerial approval?

WITNESS A: Yes, whatever the highest possible stringency is that could be applied. I would like to see as part of that process not just a recommendation from an animal ethics committee but also independent evaluation from a veterinary animal welfare science point of view so that it is not just taking what the scientific community has put up at face value.

Ms ABIGAIL BOYD: Good afternoon. Thanks very much for your attendance and your submission. I want to talk about the inherent conflict of interest in a researcher also being responsible for animal welfare. There are two options, as I see it. You could either put in someone, as we heard from our last witness, who is independent from the research team and who is looking after animal welfare—that is how you are dealing with that conflict of interest—or you make the process very transparent, with lots of accountability, and make sure that there is a real discouragement from abusing the conflict of interest. In your view, what is most realistic for us to do in terms of improving animal welfare within animal research? Is it feasible for us to, for example, put CCTV cameras in and have a more enforceable model? Or would it be better just to put some sort of independent person in?

WITNESS A: I would like to single out as, to me, as close to ideal as you can get. Of course, it is a small institution, and that means they can probably do more than a large institution. Yet they have an extremely proactive animal welfare officer, who is a veterinarian, who is there with the researchers, training them and competency assessing them until satisfied that they have reached that level . That model exists, and I believe it works extremely well. That is what I would be advocating for: that institutions must employ a veterinarian or person with similar qualifications. That is already required in the code, up to a point. But I believe if that was implemented more robustly, you would see two things. You would see better animal welfare and you would see better-quality science, and ultimately greater support for social licence.

Ms ABIGAIL BOYD: Thank you. There has been a lot of talk about the potential for duplication of research using animals because of a failure to report or to have any kind of transparency over failed experiments or failed research projects. How would you propose that we deal with that?

WITNESS A: I think that would be great to see more of, but I think in practice it could be difficult. Researchers and institutions already face quite a substantial reporting burden, and how you would audit it to see that it was being done properly is another question. I think it is a great idea in principle; I think it could be difficult in practice. I suspect the problem of duplication is not quite as great as it might be seen, in some instances, because for any researcher to do an experiment involving animals is an expensive undertaking. They need funding. They need resources. For that reason, they will usually think very carefully before even putting in an application to an animal ethics committee.

I would like to think that within their professional network of scientists in the same specialty field, they would have a bit of a feel for what was going on in other institutions. And so, the chance of duplication—I am sure duplication occurs, but I suspect it is not perhaps quite as great as it might be seen. I am being pragmatic here. I am not opposing what you have talked about. But if I had to choose my priorities I would probably be looking at other things, perhaps like what I described earlier; that is, a more robust veterinary-slash-animal welfare science oversight with greater transparency.

Ms ABIGAIL BOYD: On that, then, is part of the issue that if you have a successful bit of research, you do go through that whole process of writing it up, of being peer reviewed and of getting to the point where it is able to be published, whereas the same rigour presumably would not be applied to a failed—

WITNESS A: No, you are right. I think actually that is something that is probably not well recognised. Quite a lot of research, particularly in universities, where there is scope for cross-subsidy from other streams of revenue in the university—a lot of "proof of principle" experiments are undertaken and are deliberately not designed to deliver definitive results.
a lot of those, I think, are fairly questionable in scientific rigour and likelihood of success. So I think that is a problem in the system at the moment. There is quite a lot of work going through that has not really been through intense scientific scrutiny because there are funds available within institutions. I think part of the explanation of that is not because institutions do not care, but there is this terrible pressure for them to churn out publications,
. I think some sort of tightening up of those sorts of projects, where they have not been through scientific scrutiny, is warranted.

The Hon. LOU AMATO: Thank you for being here, [Witness A]. In your submission
You said:

Do you know why it was going to close?

WITNESS A: The reasons given were, one, that the Western Australian Government was subsidising its operations to the tune of about a million dollars a year, which is really not much in the scheme of

things. Considering it employed 70 or so people and supported other local businesses, I did not find that a very compelling argument. There was also an argument that the site on which it is located, which is owned by Murdoch University—the university wanted that land back. It had been made available to that breeding institution for many years at a peppercorn rent, and they in recent years had jacked up the rental to the point where it was impacting significantly on the bottom line of the operations of that facility.

The Hon. WES FANG: I may just jump in. We heard testimony today that it is actually going to remain open. I think they said that.

The Hon. EMMA HURST: They did say that.

WITNESS A:

The Hon. WES FANG: The irony.

The Hon. LOU AMATO: The Western Australian Government is trying to find a new provider.

WITNESS A:

The Hon. LOU AMATO: That is what I am trying to understand, because you stated that the organisation was really renowned for being up here.

WITNESS A: Yes.

The Hon. LOU AMATO: And if the Western Australian Government was funding them, then why would they have to find someone else to fund them? That is what I am trying to understand. I understand the other part with the peppercorn rent, but I am trying to understand—why would you find someone else?

WITNESS A: There are a couple of reasons. A lot of the infrastructure is very aged, so there is a lot of capital expenditure that would be needed to give it longer-term sustainability. The other fundamental problem—which has always been the case, and it is extraordinary that it has not been raised a long time ago—is that it is on the west coast and most of the research using those animals takes place on the east coast. That brings about two problems: obviously freight costs, but also welfare impacts on the animals. Animals have died sitting on the tarmac on a hot day, waiting to be flown over to the east coast. That facility has done a lot to reduce those risks, but still, when the animals arrive, they are in a bit of a state. I think a much better model would be to have perhaps nodes on the east coast, and one on the west coast, to localise the breeding and not be totally dependent on one facility on the far side of the country. I believe there is reasonable support for that in principle, but it is some way off yet.

The Hon. WES FANG: Thank you for coming today and providing some evidence to us. I appreciate the in-camera issues and the difficulty with the role you have, but that is where I am going to start my questioning. I am just going to get your correct job title. Is it correct that you are—it has just disappeared.

The Hon. EMMA HURST: I am sure he can tell you what his job title is.

WITNESS A:

The Hon. WES FANG: On online research, you were listed as

WITNESS A:

The Hon. WES FANG: Yes.

WITNESS A:

The Hon. WES FANG: And before that, . Is that correct?

WITNESS A: Correct.

The Hon. WES FANG:

WITNESS A:

The Hon. WES FANG: In that circumstance, if there are failures in the welfare of animals that have been in those organisations, who would have been primarily responsible for that instance? In the chain of responsibility, where would it have fallen?

WITNESS A: The regulatory code puts ultimate responsibility on the person in charge of the research project, usually described as the chief investigator or the principal investigator. That would be a scientist, whose name would be at the top of the animal research application, and that is where the code places responsibility. Of course, that person is employed within an institution. Legally, under the law in this State, it is the chief executive officer of the institution, which is usually the vice-chancellor of the university.

The Hon. WES FANG: So in the instance where you have perhaps had concerns, disagreed or felt that research, such as smoke inhalation experiments, was not conducted in a way which you felt was proper ethically, from your role, what did you do in order to try to bring the organisation around to a different view?

WITNESS A: Well, the process would be to bring the matter to the attention of the animal ethics committee at the institution. That would be done either directly by writing to the committee or through an animal welfare officer at the institution, who would then submit it to the committee.

The Hon. WES FANG: And what was the response to your communications to them?

WITNESS A: Without naming the institution, I was quite concerned because of, just to give an example, a situation where an experiment came to my attention because was concerned about welfare aspects of it, and so I drew it to the attention of the the institution. And I was quite concerned because in that protocol I felt there was inadequate detail of the surgical procedure to which the animals were being subjected. More specifically, I do not think it set out in enough detail the steps that would need to be taken to ensure sterility of the operative site. I did not think there was adequate detail about anaesthesia; indeed, I felt that the method of anaesthesia was out of date.

The Hon. WES FANG: Ineffective?

WITNESS A: Potentially ineffective, but there are better methods available and the code requires you to use best practice. Thirdly, I felt there was inadequate detail of how to manage the animals' hydration status—fluids, if you like. I wrote to the animal ethics committee of the institution and got a response back which, I have to say, surprised me. This is not typical of all institutions, but I was concerned that it would happen at all. I suggested that the committee might want to have another review of the application to ensure that it met best practice, and I was told that that would contravene the committee's review procedure because approval was given under the terms of best practice at the time. Now, what I have just described to you—sterility, hydration and anaesthesia—hasn't changed in the three years since that protocol was approved. So I was concerned about that. .

The Hon. WES FANG: In that instance, then, was an investigation undertaken?

WITNESS A: There was a discussion at the animal ethics committee to which I was not party, and that concerned me as well. The argument was that I had a conflict of interest. I cannot see why I would have had a conflict of interest in the welfare of an animal . I felt the investigation was underwhelming and lacked the sort of commitment I would have expected and the sort of commitment that I have seen at other institutions.

The Hon. WES FANG: Would it be fair to say that where a surgical procedure is being undertaken—and the sterility of the site is obviously paramount when any surgical or inter-operative body procedure is happening because infection and the like is a great risk. Would the loss of the animal to research not create a bigger risk to the participant? Say they lost an animal because it got an infection because it was not sterile. Would that not have the potential to throw out the numbers on whatever research is happening?

WITNESS A: If the animal got to the point where it had to be killed or died, yes. But what about the situation where an infection is nonlethal yet is affecting the animal physiology and, therefore, affecting the physiological processes you are trying to monitor as part of the experiment?

The Hon. WES FANG: I guess I am surprised that a research organisation or a researcher, the chief—I have forgotten the term that you used.

WITNESS A: The chief investigator.

The Hon. WES FANG: That the chief investigator would allow a situation to occur where an operation was occurring in a not-best-practice—

WITNESS A: What if they have not been trained to a level to appreciate that what they are doing is not best practice? That does occur, as it did in this case.

The Hon. WES FANG: In that instance, is it not incumbent on the organisation to provide that guidance to that person about the—

WITNESS A: Yes, it is incumbent upon the organisation, and this brings me to another concern about the state of resourcing for the regulatory body in New South Wales. In the past they would conduct the regular audits of animal research institutions to a very high standard. They no longer are involved in all of those audits, and we have arrangements where we have two institutions doing a quid pro quo: "I will inspect your facilities. You will inspect mine." To me, that is a fundamental conflict of interest. A major university that I know of recently had its independent external review conducted by a single individual remotely. COVID is not an excuse. There have been legitimate audits going on throughout COVID; I cannot understand how this particular institution would find it okay to have a single individual remotely doing their four-yearly audit when the regulatory code actually says that those audits have to be done by a panel with members, plural.

The Hon. WES FANG: [Witness A], I have to say that of all the evidence we have heard today, I think yours is the most compelling around the provision of research. I have really appreciated having the opportunity to speak to you about it. I have actually found it really enlightening, so thank you very much.

WITNESS A: I appreciate that.

The Hon. WES FANG: The fact that you answered the questions of what I thought were—I am drilling down on these topics quite firmly, and you were quite able to provide me lucid, succinct answers. That is really helpful, so thank you.

WITNESS A: Thank you. I appreciate the questioning.

The CHAIR: [Witness A], I have a few questions before we draw this afternoon's session to a conclusion. On more than one occasion the witnesses we had today—and you have done it yourself—spoke about, from their practical experience, this variance that exists between facilities. Particular facilities, without naming them, appear to have a high standard or what is described as a satisfactory standard, at least, with respect to animal welfare matters. Some appear to be described as very good, but clearly there are some that are underperforming in regard to this area. It is not clear in my mind yet—and, of course, we are not nominating individual ones—why there appear to be these peaks and troughs, as opposed to a more standardised position which is rigorously followed across the facilities that do this work. Would you care to, with your experience, make some comments about why you think this variance exists?

WITNESS A: That is a very good and interesting question. I do not think it is simply institutional size. I said earlier that is small and perhaps they can do more to raise the standards, but I can think of two major universities—one is up here and the other is considerably below. I suspect it is a cultural thing that probably evolves steadily over a number of years. Again, if I had to offer a solution, I would come back to what I see as a weakening of the regulatory body in this State. The poor-performing institutions are not getting the same rigour of inspection that used to take place 10, 15 or 20 years ago, so that would be part of it. I think there is probably internal politics, as well. It is not an easy one to answer.

The CHAIR: No, no. That has been helpful. With respect to this matter of inspection or audit—forgive me; I am not familiar in detail with the legislation. With respect to that work done of inspection and auditing, who has the primary responsibility for that in New South Wales?

WITNESS A: It is the regulatory body—the Department of Primary Industries—and the statutory body charged with overseeing the implementation of the legislation, which is the New South Wales Animal Research Review Panel.

The CHAIR: So the remit, amongst other things, with respect to that panel is the oversighting of this auditing and review of the way in which animal research is being conducted?

WITNESS A: Yes.

The CHAIR: Putting aside for a moment the resource—I will come back to that in a moment. Has the nature of that group changed over recent times? Or is it essentially, as a body, at a consistent sort of existence, and it is a resourcing matter, in your opinion?

WITNESS A: One concern about it, to me, is that the chair of that panel has always been somebody who comes from an animal research background. That does not mean there is a real conflict of interest, but there is a potential conflict of interest. I am not a member of the panel. I have never attended a meeting, so I cannot actually say how well the current chair is managing that conflict of interest. But it is a problem that I have with the structure of the panel, and it is a problem that I also have with the structure of many animal ethics

committees. Of course, as you know, there is an animal ethics committee attached to each institution. In a lot of instances, the chair of those committees is an animal researcher.

Yes, they have procedures in place to try to manage that conflict of interest, but in practice I have seen that fail. In practice, I think it is very difficult to really manage that properly. I have seen chairs of animal ethics committees who are not animal researchers, and I think that is a much better arrangement. I have seen a professor of philosophy, for instance, chair an animal ethics committee. I I know a veterinarian—

—who chairs an animal ethics committee.

. I think we cannot continue having people who come from an animal research background chairing animal ethics committees or chairing the statutory panel itself.

The CHAIR: With respect to the auditing you described as five, 10 or 15 years ago being to a better quality or standard, can I press you a bit further? At what point, if you are able to identify it, did things start to decline, in your observations, in terms of the rigour around the auditing?

WITNESS A: I would say maybe five or six years, or something like that. Some of the nice-to-haves that the department used to provide was regular training for members of animal ethics committees. They used to have these two-yearly symposiums. I think the last one of those was about five years ago. They also used to produce some very good, evidence-based guidelines for animal care, and most of those are well out of date now. It is probably 15 years since the last one of those came out. I would say that particularly in the last five years I have noticed—again, it has been particularly manifested in the fact that they are struggling and often failing to conduct the audits themselves. They are saying to institutions, "If you can bring in a consultant or somebody you think is suitably qualified, that will be good enough." Unfortunately, I do not think it is. I think the inspectors they used to have were highly qualified, experienced people, and they had institutions shaking in their boots. It is not the idea to frighten people—it is meant to be an educative process—but, nevertheless, I think they were taken much more seriously than they have been in recent years.

The CHAIR: With respect to those audits, are they annual audits?

WITNESS A: They used to be three-yearly in New South Wales, and then the national code was revised and made it mandatory to be four years, so they are now every four years.

The CHAIR: You spoke about the current code being reasonably satisfactory in your observation. You spoke about, under the current code, a provision for vets to be available with respect to some animal research, but you put a qualification on it at the end that not all research required vets. Could you flesh that out a little bit? Unless I misunderstood you, I thought that there were some requirements under the code for vets to be present and on site but perhaps not others. Did I misunderstand you?

WITNESS A: No, no. There must be access to veterinary support and veterinary care under the code. One of the difficulties is that the legal definition of "animal research" in this country is extremely broad and it includes research into wildlife and conservation, so people going out and counting kangaroos in a paddock still has to be approved by an animal ethics committee. Perhaps that is something else this Committee might want to consider. Does the same amount of effort and regulation really need to apply to studies that are non-invasive—looking at animals in their natural habitat—as it does to animals in laboratories undergoing surgical procedures?

I think there is a certain amount of wasted effort looking at the minimal-impact research projects that could be better spent looking at the high-impact research projects. I think veterinary oversight already happens, of course, at the animal ethics review process stage, because you have to have vets on the animal ethics committee. Not all of those vets, in my opinion, have relevant experience. You get vets who have a dog-and-cat practice at the local suburb. That is great, but that requires slightly different experience and background to managing anaesthesia in mice or those sorts of things. I hope that answers your question.

The CHAIR: That has been helpful. Well, I am sure there will be time after we read the *Hansard* for members to develop some supplementary questions. I am sure that will follow today's hearing. We will provide that to you, and our secretariat will liaise with you over a return to those questions. Thank you very much. It has been very helpful to us.

WITNESS A: I would like to thank you very much for your time and attention.

The Hon. EMMA HURST: Because there are two minutes left, could I ask [Witness A] if there was anything else that he wanted the Committee to know about today that we have not covered?

WITNESS A: There are particular examples. There was an instance, again getting back to the nose-only smoke exposure method, where I wrote a detailed report expressing my concerns to the regulatory body. Part of the concern surrounding that incident was the fact that the institution performing that procedure was in

collaboration with another institution because the professor in overall charge of the research program was employed at the second institution. So, you have a professor at the institution not doing the research, but he is overseeing the research at another institution. The regulatory body has guidelines that say that the animal ethics committees at these two institutions must be in communication with each other and that a copy of the approved protocol must be seen by both committees. That was not happening. The institution that employed the professor, which was where the research was not being done, did not show those protocols to that animal ethics committee.

In my view, that was in breach of the code and in breach of the regulatory guidelines. I challenged that, and because of the confidentiality provisions under the legislation I was never told the outcome. Maybe that is none of my business, but it concerned me very much that we had a major, high-impact procedure going on that was in collaboration with an institution that seemingly did not want its ethics committee to know anything about it. Also pertinent to that story is that this institution—where there was a professor but no research—a couple of years previously had received an application from somebody else at the institution to use the nose-only smoke exposure method, and the ethics committee had knocked that back. I feel that this institution was deliberately evading its obligation to ensure that both ethics committees were aware of what was going on.

The CHAIR: On that note, I understand that this has been evidence in camera, and we appreciate that. But would you be open to our secretariat liaising with you and talking with you about whether there is any portion of it that may be de-identified?

WITNESS A: Yes.

The CHAIR: That could potentially be used as evidence to the inquiry for our deliberations over the preparation of the report.

WITNESS A: Of course, more than happy.

The CHAIR: The secretariat can speak to you about that. Thank you very much. That concludes questioning for the day.

(The witness withdrew.)

(Evidence in camera concluded.)