



Select Committee on Risk Assessment and Risk Planning

Corrected oral evidence: Risk Assessment and Risk Planning

Wednesday 3 February 2021

10.30 am

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Members present: Lord Arbuthnot of Edrom (The Chair); Lord Browne of Ladyton; Lord Clement-Jones; Baroness McGregor-Smith; Lord Mair; Lord O'Shaughnessy; Lord Rees of Ludlow; Lord Robertson of Port Ellen; Baroness Symons of Vernham Dean; Lord Triesman; Lord Willetts.

Evidence Session No. 9

Virtual Proceeding

Questions 92 - 105

Witnesses

I: Dr Cassidy Nelson, Co-Lead of the Biosecurity Research Group at the Future of Humanity Institute, University of Oxford; Dr Opi Outhwaite, Associate Professor in Law, St Mary's University; Dr Catherine Rhodes, Senior Research Associate of the Biosecurity Research Initiative, St Catharine's College, Cambridge.

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Examination of witnesses

Dr Cassidy Nelson, Dr Opi Outhwaite and Dr Catherine Rhodes.

Q92 The Chair: Good morning, and welcome to the Lords Select Committee on Risk Assessment and Risk Planning. This morning, we will be considering biosecurity. We have three witnesses: Dr Cassidy Nelson, the acting co-lead of the Biosecurity Research Group at the Future of Humanity Institute, University of Oxford, Dr Opi Outhwaite, senior lecturer in law at St Mary's University, and Dr Catherine Rhodes, senior research associate with the Biosecurity Research Initiative, or BioRISC, at St Catharine's College.

A transcript of the meeting will be taken as usual. We will publish it on our committee website. Witnesses, you will have an opportunity to make corrections to that transcript, where necessary. Welcome to you all. As we have three witnesses, you do not each have to answer each of the questions. We expect to finish at about 11.45 this morning, so I would be grateful if you could help us with that.

As I said, you do not all have to answer each of the questions, but my first question is aimed at all three of you. It is about the UK's biological security strategy, which was published in 2018. Do you think it is still fit for purpose? What is your assessment of its implementation to date? Dr Nelson, you have been critical of the implementation of the strategy. Would you like to talk us through it?

Dr Cassidy Nelson: Thank you for having me with you today. We organised a workshop about a year and a half ago with a bunch of leading biosecurity experts around the United Kingdom. At that workshop, we went over the strategy. Various aspects of it were quite on point. It goes through a lot of the risks that biological threats can pose, including the natural, accidental and deliberate aspects.

However, with regards to the implementation, we identified some shortcomings. I would like to focus on dual-use research. There was mention of assigning ministerial oversight of that. To the best of our knowledge, it has yet to be done. At our institute, we feel that a major part of the picture is having someone assigned and responsible for implementation. We hope that that type of responsibility can be taken on board.

Dr Opi Outhwaite: I agree with that point. The strategy was adopted and, yes, it is relatively recent, but going into the current situation with Covid, it appeared, at least to me, that very little implementation at all had taken place at that point. Some of us were due to give evidence to the National Security Strategy Select Committee in 2019, and that was delayed because of the general election, and so on.

There has been a gap, and some of the important developments that were noted in the strategy, such as the need for an all-hazard approach, have not materialised in that time. In my view, that is an important step

that needs to take place. The institutional administrative leadership on biosecurity has not developed in this time, and it needs to be there.

The Chair: Why do you think that is?

Dr Opi Outhwaite: My feeling, or my observation perhaps, is that the concept of biosecurity is understood in the strategy; the idea of needing an integrated, more co-ordinated, slightly more holistic approach to addressing risks—natural and introduced—is kind of there, but it has not translated into a higher level of understanding at government level. We can see that, and its implications, very clearly going into this pandemic. Perhaps this is pre-empting another question, but it has been a frustration to those of us who have experience of biosecurity that we seem to have been following the steps of biosecurity in reverse going into this situation. Without an institutional and administrative platform for policy and legislative change, we will not get the integration, information-sharing and risk assessment that are needed.

Dr Catherine Rhodes: I agree with the previous comments. As regards the strategy's fitness for purpose, it is clear that updating is needed. The assumptions that underlie it, which are not necessarily the stated assumptions—there are a lot of implicit assumptions as well—could do with being rethought, given the current situation and what we now know about the lack of preparedness.

There is also the fact that departments and agencies have shifted since it was written. DfID no longer exists, or is incorporated into the Foreign and Commonwealth Office now, and a national institute for health protection will be created, so there is a need to reflect that. More fundamentally, there needs to be more attention to implementation, including in the strategy itself.

For comparison, the US national biodefense strategy, which was published around the same time, devoted around a third of its content to its implementation plan, whereas in the UK biosecurity strategy the implementation section is one page that simply details the governance structure. A more detailed implementation plan makes accountability and monitoring much easier, so that you can track progress and know what should be delivered at what point. That is also an important area.

Q93 **Lord Browne of Ladyton:** At the outset, I restate my interests as working closely with BioRISC at Cambridge University.

I have an interest in leadership, implementation and accountability. These may be difficult questions to answer, but I think they are really important. I ask them, because we will almost certainly have to make recommendations on that area. As you pointed out, Dr Rhodes, the implementation part of the strategy is superficially attractive. It is very short and pretty clearly stated, apparently. It says that the Minister responsible is the Security Minister, and it sets out the governance structure, which involves a governance board, reports to a sub-committee of the National Security Council, and has an oversight role for

the government chief scientist.

We have the benefit of the evidence that was given to the Joint Committee on the National Security Strategy by Dr Nelson and Dr Outhwaite, and our own experience, so we know that the governance board has met twice in two years, apparently. The particular sub-committee of the National Security Council disappeared in July 2019, because that capacity was needed for Brexit, and has not been reinstated. From questions, it does not appear that there ever was a report to that committee, even before it was disbanded.

Was that form of leadership, accountability and governance ever appropriate, or did we need something much more complicated? Should we be saying to the Government that it is time to get the system to work, and then we will have better national security in relation to bio-risks?

I would like to know your opinions. I suspect we may be able to come back to this in a more forward-looking way later in our session, but I would like your reactions at this stage. I am sorry that was quite a long question, but I think it is important.

Dr Catherine Rhodes: This is only a short response, but clearly there needed to be a better structure, or just the establishment of the governance structure. It seems sensible for there to be some sort of centralised unit for that. Again, part of it will be visibility and transparency to external audiences. It is very hard to see from the outside whether anything was set up, and to work that out. A centralised unit that can engage with external stakeholders as well as with the internal parts of governance is important.

Dr Cassidy Nelson: I agree. In general, it is necessary to have someone, or a body, actually accountable and responsible for making sure that the implementation goes through. In the report itself, there is discussion of different pillars of what we are trying to do, such as being able to detect and respond to events like those we have experienced with Covid-19, and to be able to understand those types of biological threats. In that respect, I feel that, as it stands, there is no mechanism at the moment for a true understanding of the full range of biological threats. If it is to be implemented in full, there needs to be a group or a body that is responsible for the full range of the strategy.

Our institute released a working paper on the idea of a national institute for biosecurity. That would go beyond what the soon to be formed NIHP does, in the sense that it would not just be a response agency but would understand and do proper risk assessment of biological threats, as well as develop better preparedness across the board.

Dr Opi Outhwaite: Those are really important points. I understand that it will be difficult, but we need leadership and governance of the area that properly recognises and addresses the complexity of the issues.

The only thing I would add more explicitly to Dr Nelson's comments is that the organisations that we have now—the Joint Biosecurity Council and the new NIHP body—make reference to biosecurity, to pandemics and zoonoses, but in their aims and governance structures they look to me like fairly traditional public health bodies. They are not biosecurity bodies in the way we would usually understand those. If we are to address this complexity, which in my view we need to, there needs to be something different from what we have now.

Lord Browne of Ladyton: May I ask a very leading question? Do we also need some proper method of accountability to Parliament, which to my knowledge has never once debated the strategy?

The Chair: Is that a rhetorical question?

Lord Browne of Ladyton: I would expect them to agree.

Dr Opi Outhwaite: Generally, I am in favour of accountability, yes.

Lord Browne of Ladyton: Thank you.

Q94 **Viscount Thurso:** I am interested in the relationships between wildlife disease, animal health and human disease transfer. Dr Outhwaite, does the UK's biological security strategy adequately account for the risk from animal to human disease transfer?

Dr Opi Outhwaite: This partly overlaps some of the comments that we have made already. The strategy recognises in general terms that that risk is there. I go back to the points we have already made about implementation, because they stand generally and also affect the wildlife health issue.

More specifically on wildlife health, our policy and legislative measures, and the strategy, probably do not go far enough. I have made these points in written evidence. The strategy framed—clearly it will not do this now—the possibility of a zoonotic disease emerging from wildlife that becomes a human health risk as something that would not come to the UK. Its tone, and the UK's response until last year, seemed to me to focus on capacity building in other countries, and that kind of thing, and did not properly understand that a zoonotic pandemic would reach the UK. We heard these things repeatedly characterised as unprecedented. They were not unprecedented. We had SARS, we had MERS, we had avian flu, we had swine flu, we had Zika and we had Ebola. It was not an unprecedented risk.

The idea that things were coming from wildlife reserves to kept animals, as it were, and into human health had not properly been acted on when it came to developing the strategy more tightly and implementing it. Going back to the point about us not having a biosecurity Act, we therefore do not have specific measures on wildlife disease. We do not have incorporation of surveillance among wildlife. It is very much assumed, and we see it reiterated in media coverage, that wildlife diseases emerge

in particular countries, but there is nothing to say that the emergence will not come in the UK at some point. That is not properly recognised.

It is difficult to address wildlife surveillance. It has to be a public good, because wildlife is not owned privately, on the whole. It is difficult and it is a complex area, and it has not been properly addressed. It is not in legislation for the most part. Legislation addresses very specific species or diseases. It does not provide a general basis for looking at the emergence of diseases, and the interaction between wildlife and farmed or kept animals.

Viscount Thurso: Would you, in brief, say that there is a gap between veterinary medicine, human medicine and wildlife surveillance, and somehow we need to find a mechanism to join them up?

Dr Opi Outhwaite: Yes, I would say that. We do not necessarily need to find the mechanism. I do not work in One Health, and I do not have a particular vested interest in it, but that is a model that has emerged internationally specifically looking to join up those three areas, because there frequently are gaps, and there ought not to be.

Viscount Thurso: Dr Rhodes, would you like to comment? It is not obligatory, but I know you have commented in the past.

Dr Catherine Rhodes: It is one of the areas of unstated assumption in the strategy. As Dr Outhwaite pointed out, it is partly that these things are somehow expected to happen elsewhere and not affect the UK in a major way. Ebola was given as the example. We supposedly had prepared for pandemic influenza, which again would generally be of zoonotic origin.

The other assumption, which was just picked up, is that zoonotic disease, and surveillance of it, belongs with the veterinary services and does not seem to transition into public health considerations. For example, One Health is not mentioned in the set-up for the national institute for health protection either. There is a possibility that it is just going to continue in these new structures. I think we should be conscious of that.

Viscount Thurso: Dr Nelson, for completeness, would you like to add anything?

Dr Cassidy Nelson: I agree with all the points that have already been made. One more point worth mentioning is that, with zoonotic diseases, we need to think about laboratory use of animals, as well as laboratory use of pathogens. The UK has experienced issues with that in the past, such as with foot and mouth disease in 2007, which linked back to a laboratory leakage. In general, we need to approach this across the entire spectrum of human-animal interface, as well as thinking through what types of effects this could have economically and on health.

We as a country do not have a robust system for doing types of pathogen surveillance, both in animal populations and in human populations. The UK could lead on that, with pioneering technology such as metagenomics,

which is able to look at pathogenic genomes across the spectrum. It would also be able to assist with novel emerging infectious diseases we have not seen before, and help with things such as the lack of diagnostic capacity that we unfortunately experienced early in Covid; we found it quite difficult to do a diagnosis. Genomics-based surveillance should be considered for wildlife as well as human population health.

Q95 Baroness McGregor-Smith: My questions are about the current pandemic and how we follow on from it. Some of them have started to be answered, but it would be good to get your reflections. First, what is your assessment of how we have handled the current pandemic? Secondly, in the lessons we have learned so far—I am sure there will be more—what is there that is good and that we should continue to implement, if this happened again, and what could we improve? Dr Outhwaite, perhaps I could start with you, because I know you have made some comments on this in the past.

Dr Opi Outhwaite: Perhaps I will start with the positives. I have to be cautious because it is not really my area, but it appears that we are doing very well on the vaccine front. That reflects that our public health response is quite sound. We have good public health expertise, and we are able to roll out that expertise and infrastructure and decision-making quite well

However—perhaps I am being a bit too bold—we are not very good on biosecurity. In the way we have responded to the pandemic, as I said, it has been very frustrating to see the stages of biosecurity not really being understood or followed, at least from my perspective. The idea of biosecurity is that you try, for as long as you can, to keep out emerging diseases, or diseases that are not in your particular area or country. You have pre-entry controls, and you try to stop things coming to your borders. You have point of entry controls, so you try to minimise the risk at that point. Lastly, you have post-entry controls. Post-entry controls are last because it is recognised that once something is in the country it is very difficult to contain it. It is very expensive, in financial and non-financial respects, to contain it, and it is very difficult, if not impossible, to eradicate it.

Baroness McGregor-Smith: Would you therefore have followed the approach that Taiwan and others took on border control?

Dr Opi Outhwaite: I am mindful that I do not work in public health, but to me border controls, or pre-entry controls even, are the first port of call. It was slightly horrific to me to see the pandemic unfolding, yet we did not adopt any travel restrictions, for example. In December 2019, I had a conversation with colleagues who were planning to travel en masse to Vietnam for a work event. I said, "You ought to be cancelling that trip because of the outbreak in China", and they said, "But it's not in Vietnam". I thought, "It certainly will be in Vietnam and it certainly will be in the UK soon". There is the fact that there were no border controls then.

Then there was the decision to stop people reporting when they had symptoms, to reduce reporting, and not to have community testing so that we understood where the prevalence was. As I said, I feel that we have seen it all happen in reverse. Finally, at this stage, we are starting to introduce border controls, and that is a frustration to me. That has not helped where we are now.

Baroness McGregor-Smith: Dr Rhodes, I am interested in some of the comments you have made. You have talked in the past about recognition of the risk, but a big gap in planning and being prepared.

Dr Catherine Rhodes: Again, some of this is very well captured in the recent biosecurity and national security report from the Joint Committee on the National Security Strategy. There have been clear flaws. Again, I would pick up the lack of border controls. The test and trace system still seems not to be fully operational. It seems that the risk was not appropriately understood. During the first stage of understanding the risk, it seemed to be thought of as something far off that would not reach us, rather than us taking a very proactive stance, so that meant that the early interventions were delayed.

The exercising on preparedness was limited. It did not happen very often and did not extend to key areas, so it did not properly reflect things such as business continuity. Recognised gaps were not filled; the PPE situation was not addressed, even though it had been recognised in advance. There has been underinvestment over years in the surge capacity of the NHS. That had been recognised. Year on year, we were hearing that, when it came to the winter season and flu, we were at 95% to 98% capacity, and there was no spare capacity. There were several things that we had not picked up and we had not done what we needed to do.

To add another positive, one of the positives for me is the way the public have responded. I did not expect the public to respond so co-operatively, for so long, and for there to be majority compliance with such not only tough but variable restrictions. That is positive.

I have been asked in a few different forums whether Governments will learn lessons. We probably have a short timeframe of opportunity before we shift back into what is known as the panic and neglect cycle for dealing with disease outbreaks. I hope the capacity-building lessons will be learned. The other area in which it is likely, or I am hopeful, that lessons will be learned is to do with the structural inequalities in the UK that have contributed to the differences between communities and how they can address disease threats.

Baroness McGregor-Smith: I am interested in your point about surge capacity. Clearly, the NHS has not been built to deal with this situation. In a reflection on how we deal with it going forward, what do you think should happen with the NHS?

Dr Catherine Rhodes: There has been a suggestion that surge capacity should give you at least an extra 20%, and you should have some

flexibility. I think that is true. I am not particularly expert in this area, but there is a need to join up the health and social care systems properly, which has also been recognised for years. We saw that particularly at the beginning of the pandemic; people were being shifted out of hospitals into social care before that should have happened, and vice versa.

Sorry, I have lost track of the question. Is there something else you want me to add?

Baroness McGregor-Smith: No, I was just interested in your points on that. Thank you very much. Dr Nelson, is there anything you would like to add?

Dr Cassidy Nelson: I agree with the previous points. One of the disappointing features, especially early in the pandemic, was the lack of diagnostic testing availability, as well as on-the-ground situational understanding of how much community spread there was. In general, I think there was a bit of hesitancy—for example, to expand the laboratory network to be able to include more private laboratories to run tests early on. Those types of situational necessities could have been pre-empted beforehand, so that we asked, “What do we do if we have this type of situation?” It is sad that we were able to see what was going on in places like Italy and somehow thought that perhaps it would not happen here.

We have looked quite a bit at comparable countries and how other countries responded. South Korea, which had had experience with MERS in 2015, was able to ramp up diagnostic testing quite rapidly. In addition, the border control lockdowns in some countries, which seemed a lot at the time, came too little, too late, unfortunately, in the UK. It seems that that type of strategic co-ordinated response could have been pre-empted.

I worry about this experience. Prior to this, we had planning that was mostly focused on influenza-based pandemics and our understanding of influenza. We could have predicted that novel infectious diseases, which require a whole new level of understanding of basic traits and of what will transpire, would be an issue. Hopefully, going forward, what we have from lessons learned will not be just a very good coronavirus plan but a plan for biological threats regardless of which pathogen is the culprit.

The Chair: I was going to come to Lord Willetts next, but I think he must be having trouble with his internet.

Q96 **Lord Mair:** May I ask about dual-use biotechnologies, and get your views on how effective the UK’s monitoring and management of them is?

Dr Cassidy Nelson: Unfortunately, I do not think any country is monitoring and controlling their dual-use technologies as well as they could. The UK is no exception in that regard. As a concrete example, gene synthesis is the ability to make DNA. You can order genes to be able to engineer your own types of pathogens, such as viruses, as well as other products for DNA. We do not have oversight of that industry. There is only voluntary screening of what types of orders are being done.

Beyond that, it is commendable that the United Kingdom is a member of the Australia Group, which is a group of countries that are able to track and monitor export controls for dual-use manufacturing equipment, and to maintain compliance with the Biological Weapons Convention, as well as the Chemical Weapons Convention. A large part of that needs to be updated based on where manufacturing is actually happening and occurring, and what types of equipment laboratories are using. In general, there is very little oversight of what is actually happening in laboratories that own equipment, once they have it.

Lord Mair: In your evidence to the JCNSS, you talked about there being little clarity among UK scientific researchers. You mentioned that what was needed was much more attention to the research cycle—grant applications, experiments, publication phases. Could you enlarge on that? What do you think needs to be done that has not been done?

Dr Cassidy Nelson: We heard from journal editors as well as from researchers that it is very difficult for journals to know how they are supposed to go about their own risk assessments of research. Dual-use research is research that can have beneficial purposes but could also be used by others to cause harm.

In general, there is no good clear guidance on how to go about assessing research as it is coming through. It needs oversight at every stage of the research cycle, including at the financing and grant-making stage. What type of research are we financing? In the broader scheme, is it net good or net bad to have this type of research done? It also includes the research phase, which can pose its own risks, and the information itself once publications are made. The UK and other countries have struggled with the problem of how you have oversight and who is responsible, and what the incentive structures are for researchers who want to publish research that may enable others to cause harm.

In our recommendations, we said that something that could help to address that is a biosecurity leadership council, potentially modelled on the Synthetic Biology Leadership Council, and able to liaise directly with private industry and academia to have a type of back-and-forth discussion and understanding of the situation, especially as research rapidly progresses and poses new challenges and new things that require risk assessment done properly.

Q97 **Lord Mair:** Lord Chair, I see that Lord Willetts has reconnected with us. May I ask one final question of Dr Nelson on the topic she has just been addressing? What is the role of UKRI in advancing the sorts of measures of control that you have just outlined?

Dr Cassidy Nelson: Given that UKRI is involved with the funding stage and applications for various types of research done in the UK, it needs to be enabled and equipped with the ability to properly screen and do risk assessment on research conducted under its banner. In general, that also needs a place within government, with some form of ministerial responsibility over how it is done, who is responsible, and what happens

if something goes wrong, as opposed to the current cycle, which is that we have research that is debated very much after the fact, once it is out in the world, and that is many stages too late.

Baroness Symons of Vernham Dean: At the beginning of your answer, you talked about the Australia Group and tracking. Are there other countries that you think get this right more than we seem to be getting it right at the moment, both on the funding and on assessing the research that is actually done? You singled out the Australia Group. Are there any other countries or groups of countries that you think excel?

Dr Cassidy Nelson: Unfortunately, I do not think any country has fully gotten it right. The United States has a good plan that, on paper, addresses quite a few of these things, but in practice it has not always been good at the implementation side. It is a complex issue that has been very difficult to fully harness. The incentives—good incentives—for researchers and academics to publish their research or conduct research on dangerous pathogens, for example, are not necessarily aligned with broader public interests of protection from harm. Unfortunately, I cannot point to a particular country that would be an exemplar in this area.

The Chair: That takes us very neatly to Lord Willetts.

Q98 **Lord Willetts:** I apologise, I lost internet connection for a time. It is good to be back. I was able to benefit from Lord Mair's line of questioning. I should begin by declaring an interest as I am on the board of UKRI. I am also trying to set up a venture capital fund that would include biotechnologies.

I would like to pursue Dr Nelson's comments, particularly about the US regime. When I was Science Minister, the Americans would come to us and say, "These biologies are dual-use research of concern". They thought the amount we allowed to be published was like publishing nuclear physics in the 1930s. They thought it was significant.

What more could we do? I have been at synthetic biology conferences in the US which the FBI attended and had built up real expertise in, because it wanted to be trusted by the community. At the FBI, their concern was rogue domestic actors getting work in the labs. They were very much creating a culture where they wanted other researchers who thought that there was research of concern, or a researcher going off the rails, to tip off the FBI. The American view was that that system worked. Could we make our system more effective? Could the Synthetic Biology Leadership Council be given a role rather than creating a separate body? What more could we do at UKRI?

Dr Cassidy Nelson: I very much like the US model where the FBI is able to work as a liaison between the science communities and the security communities. That could be done in the UK, with a liaison that can work as a human bridge between researchers and security. From a UKRI perspective, the approach to risk assessment requires thinking through research that itself could be dangerous when conducted, and what the information released from research enables actors to do.

In general, that type of thinking is not necessarily readily addressed by the research community. There is not as much awareness among researchers about biosecurity concerns, or how their research could be misused. Education is a good starting point for researchers, so that they can be equipped with the ability to recognise what types of research information could be dual use. That would be a major starting point.

Lord Willetts: Dr Outhwaite or Dr Rhodes, would you like to add anything?

Dr Opi Outhwaite: I do not think I could add anything. Dr Nelson has covered the points in detail, and it is much more her expertise than it is mine.

Dr Catherine Rhodes: I would like to add something. It follows on from the previous question. One of the things we face, with biology in particular, is that, traditionally, export controls have been on things like equipment, technology and materials, but we now also need to govern knowledge and data, the information. Biology has very much become an information science. There will be ways to get around export controls simply by transferring data across borders rather than transferring materials. We have to catch up with that. It also lends itself to the other forms of governance Cassidy pointed to: what do publishers and funders do, and how do we encourage researchers to be aware of the issues?

More directly to the question of whether some of it should go to the Synthetic Biology Leadership Council rather than a new body, I would push in the other direction, simply because it picks up on biosecurity being broader. There is not just synthetic biology to be concerned about. Another area is convergence of technologies. There may, for example, be developments in nanotechnologies that help with the delivery of a drug, and which would also help with the delivery of a biology weapon. We need a body that can take other sectors into account effectively as well.

The Chair: These answers are flowing very neatly into the next questions.

Q99 **Lord Rees of Ludlow:** I have two questions. The first is a follow-up to what we have heard. What has been said is rather scary because we know that just one or two bad actors could cause something catastrophic. Even if we have regulations that are internationally agreed by formal bodies, how effective can the enforcement realistically be? I worry that it will be as hopeless as enforcing drug laws or tax laws globally. Do you feel there will be a big problem enforcing these laws adequately, given that the stakes are so high, without intrusions into privacy? It is a follow-up to what Lord Willetts was asking.

Dr Catherine Rhodes: I certainly think that enforcement will be difficult. That is why there is a move to think about whether we need to do something more about the culture and education of scientists to help them to be aware of the concerns, but there are dilemmas about how much you teach about risks without giving away what a bad actor might

choose to use. There is scope for ongoing discussions between the security and scientific communities. The fact that all pathogen genetic sequences are openly published online raises a high risk of their being open to misuse, yet there is a very strong drive within science to keep those things open. Sharing that information is important for public health reasons and for addressing things such as pandemics. How those communities can come together to provide some compromise solutions is a very important dialogue to have.

Lord Rees of Ludlow: It could happen in some unregistered private lab somewhere in the world, and it would be hard to check that up. Are there any other thoughts on these concerns? I do not want to be too much of a doom-monger.

Dr Cassidy Nelson: Governance in this area will always be inherently quite complex. It will be difficult to do enforcement. We think a lot about risk at our institute. We have nailed down on the idea that, if you make the steps involved sufficiently difficult, you might not be able to prevent all bad actors from being able to successfully go through all the steps involved, but you will drastically reduce the pool of capable actors. There are some areas in which you would be able to do it—for example, access to the manufacture of biotechnology equipment, and education to help with peer surveillance of what is going on in laboratories. There is very widespread biosafety teaching for all laboratory staff, but it is at a much smaller level, if any at all, on biosecurity. That is a major starting point.

In general, the actual mapping of the risk landscape is not that well understood. It comes back to the 2018 strategy. Understanding is one of the main pillars. In general, we do not have full understanding of all the risks, especially from the deliberate biological threat side. As technology is rapidly progressing, and capabilities are rapidly progressing, in synthetic biology as well as in other disciplines, that understanding is the only way you will even be able to begin to think through governance options and considerations.

Lord Rees of Ludlow: Dr Outhwaite, do you have any thoughts on that?

Dr Opi Outhwaite: No, only that I would emphasise the point that one of the key opportunities we have to put measures in place before things become too scary is in the risk assessment phase. As Dr Nelson said, it is mentioned in the biosecurity strategy but it has not been taken forward. The UK is not the only country in that position. It is a very complex thing to do; it is slightly intimidating to get into the risk assessment for these technologies, and for other biosecurity risks, but at some point, if we are to tackle them well, we will have to get into these complex decision-making areas.

Q100 **Lord Rees of Ludlow:** May I ask a different and shorter question about the attitude of the wider public to these risks? Of course, the public have responded surprisingly effectively to Covid-19 in many ways, but when Mr Roger Hargreaves gave evidence, he cited attempts in the past to have government campaigns to change people's behaviour, and pointed

out that they were not very effective unless the public had a reason to be focused on the issue. Will lessons have been learned from Covid for any future pandemic, or are there other ways of sensitising the public to the risks?

Dr Opi Outhwaite: To state the obvious, the public will be sensitised to the risk in the immediate aftermath of Covid. If we take a slightly longer-term view, the messaging and the need for a cultural shift are important. It does not happen overnight, but in other areas of biosecurity, more in animal health and plant health, gradually, even in the shift to using the term biosecurity, there is an understanding of the risk of making changes in plant health, and an understanding of the need for pre-entry controls. There is a shift in smaller things, such as the number of domestic or indigenous plants that are now stocked by garden centres, as opposed to imported plants, and the checks they go through and so on. People working in horticulture, for example, are much more sensitised to those things. That has not happened overnight, but it has happened. I think the public can be brought on side.

In the gold standard countries for biosecurity, such as Australia and New Zealand, there is much more public discourse on biosecurity now. In New Zealand, for example, the public have been gradually brought on side to understand the idea that New Zealand is an island and there is an opportunity to protect indigenous plants, and health, and livelihoods, by having border controls and so on. New Zealand has had a biosecurity Act since the mid-1990s. We do not have that as a public conversation or as a culture in this country at the moment, and it will take time. I suppose Covid-19 gives us an opportunity to introduce those messages much more directly.

Baroness Symons of Vernham Dean: We are an island, too. Given what you said about New Zealand being an island, would you like to see that sort of biosecurity legislation for the island we live on?

Dr Opi Outhwaite: From the point of view of managing these particular risks, yes, I would. I certainly think there is a need, and there is an opportunity to look at how we manage biosecurity, as we have all been saying, and to adopt a more integrated approach that is perhaps a bit more proactive rather than reactive. There will be more outbreaks. There will be more pandemics. We need to be more on the front foot for them in the future, and having a more integrated biosecurity strategy, with legislation, will help us to do that. I have the luxury that I am not making the decisions about how we pay for it, or balancing all the other impacts, of course, but from a biosecurity perspective, yes.

Lord Rees of Ludlow: Do either of the other panellists have brief supplementary comments on public attitudes?

Dr Catherine Rhodes: On public attitudes and communication, perhaps we should engage the public in resilience efforts. They can be quite broad across biosecurity. Where they have perhaps been successful is in citizen science involvement to try to track invasive species or the spread of tree

disease. I think ash dieback was one of them. You become part of the reporting mechanism, and that is a good way both to build awareness of the risk and to show that there are things individuals can do to help.

Lord Rees of Ludlow: Dr Nelson, any thoughts?

Dr Cassidy Nelson: In general, in the same way as an individual develops an immune response to Covid-19, we want a social public immune response to emerging infectious diseases and pandemics. I think the public will be behind that, given the circumstances and what has transpired. The way we can harness it is by making sure that future preparedness efforts are fully and adequately addressed, and that there is accountability of whatever body is responsible for making sure that in these types of situations things that can be understood in advance are prevented if possible, and rapidly responded to, so that their scale is many orders of magnitude smaller. In general, the wider range of biological threats—deliberate biological threats and other things—may not be the public's forte. From my perspective, biological threats are of the same order as nuclear weapons, in the sense of how much they can affect, and the fact that they can affect even larger geographical areas, in various aspects.

The solution needs to be a body of people or a group, whether an institute or a centre, whether within the Home Office or central government, that is responsible for making sure that all biological threat preparedness initiatives are enacted, and that there is proper risk assessment across the board of the full range of threats, as we have been discussing in this session.

The Chair: We are falling behind a bit, so could I please ask for short snappy questions and short snappy answers, and not necessarily from everybody?

Q101 **Lord Clement-Jones:** Could our witnesses take a view on something that was said in the UK's biological security strategy back in 2018 and which very much follows the line of questioning from Lord Rees? The strategy says, "We have a strong public communications capability, to ensure that we are able to engage swiftly and clearly with the public about any action they might need to take to protect themselves or to support an effective response".

In the light of what has been said, that has not weathered particularly well. What would you do to make it ring true in a future strategy? It is not about how the messaging is put forward; it is about the people involved in formulating the strategy.

I think you are implying that we need better ways of communicating, but is there a lack of professionalism in communications terms among the current people who write security strategy? For instance, the whole impact of social media has not been taken into account. I think you have written about this, Dr Rhodes, in a recent paper. Could you comment on how we could fix what clearly seems to be a lack of breadth of expertise?

Dr Catherine Rhodes: I am not quite sure who was involved in constructing the strategy, to be able to comment on that. It would be interesting to know whether there was any contact and communication with the public in developing it. There is the matter of whether the strategy itself is communicated and whether the public feed back on it. That is an interesting point to raise and would support engagement across a range of biosecurity issues.

Lord Clement-Jones: But you yourself made a fairly early point about social media and so on just this year.

Dr Catherine Rhodes: I am less sure about that.

Dr Opi Outhwaite: Perhaps what we have not experienced so much as regards the general public is engagement from the right stakeholders. In plant health, for example, relevant groups are brought in to convey messages. Similarly, in animal health, the Animal and Plant Health Agency has been reorganised a number of times, but it has worked very carefully to develop trust, understanding and communication with veterinary associations, farmers, animal producers, and so on. Perhaps we have not seen the same sort of bringing in of different stakeholder groups in public health that we have seen in other areas of biosecurity, and that probably needs to be addressed.

Lord Clement-Jones: But sometimes you do not just have to deliver messages but have to counteract other messages in this field.

Dr Opi Outhwaite: I do not know how much has gone on, for example, in PHE—Public Health England as was. I do not think we have seen that sort of messaging. There has been a lot of research, academic and within government, for example, on how farmers understand biosecurity messages and how that impacts and translates into their practices. I do not think that we have yet seen the same focus on the more public health aspects of biosecurity. I do not know that we have a good body of research to draw on, as well as bringing in those messages. Countering misinformation is probably not my expertise.

The Chair: I think it would be best to move on to Lord O'Shaughnessy.

Q102 **Lord O'Shaughnessy:** You have all been fairly clear in your evidence to us this morning, as well as in your written evidence and in writings elsewhere, about your dissatisfaction, I think it is fair to say, with the governance around biosecurity.

Could we turn this into a more constructive conversation and ask how you would go about improving that governance to make sure that biosecurity risks are properly assessed and planned for? I am also interested in your perspectives on the Joint Biosecurity Centre, which has been created in the last year, and the impending national institute of health protection. I know you have written that there is some concern that it is too public-health and not biosecurity oriented, but it would be good to get your perspective on those, and how you think they could change to improve their function.

Dr Opi Outhwaite: I made the points that they are a bit public-health focused, so I probably do not need to repeat them. Going forward, I think we need two additional things to be connected. In the traditional biosecurity sectors of plant, animal and human health, we need public health and animal health properly connected on risk assessment, messaging, policy, and so on. We also need wildlife surveillance connected to that. I have not addressed the point about intentional risks in the governance mechanism, as I think Dr Nelson can do that better, but they need to be in a governance framework.

The governance needs to be outward looking as well as inward looking. The bodies we have now are quite focused on an internal response to a problem, to a situation, once it arises, and we need it to be outward looking in prevention as well.

Dr Cassidy Nelson: I very much agree. The Joint Biosecurity Centre and the upcoming NIHP appear to be mostly response focused, which is extremely important, especially in a situation like now, but I worry that that will not necessarily translate into the preparedness activities and risk assessment activities that will need to take place if the full range of biological threats is to be addressed in the future.

One solution, whether it is in the upcoming NIHP or whether it has its own body, is that there needs to be a central convening point or body responsible for doing that type of preparedness activity. In general, there is a big disconnect between public health for naturally occurring disease events and other types of risks. I do not think that is routinely very well integrated or incorporated into even the thinking or psyche of day-to-day public health.

A body is needed to address the dual-use research and dual-use biotechnologies that we discussed earlier. That type of place also needs to foster and bring up the next generation of biosecurity leadership. There are no good training points at the moment that could become a place where biosecurity talent is fostered and brought forward. The UK could very much benefit from a place that is able to deliver on that as well as generate new talent.

Lord O'Shaughnessy: It sounds to me as though you are not yet convinced that the existing bodies and the ones that are being created will fulfil that mandate. Is that fair to say?

Dr Cassidy Nelson: It is understandable that it is very much response focused. I do not necessarily think that it is possible for a very response-focused agency to be able to do the full range of preparedness; to be able properly to do risk assessment, and consider the other forms of biological risks that we are concerned about. That needs to be very carefully integrated into the upcoming NIHP, or it needs to be its own body, its own centre, able to deliver on all the different aspects.

Lord O'Shaughnessy: Dr Rhodes, do you have any brief comments?

Dr Catherine Rhodes: Improving the governance would be great, and I think the strategy has an aim to start doing that, but we need to know what standards we want to achieve in our biosecurity, within certain domains and across them, and be able to monitor and implement how we are doing against them. There was an opportunity, but it is now somewhat put off, to have international leadership. There was attention by other countries to the creation of the strategy and whether it was a model they should be following. If we can get it right, or certainly get it better, there is an opportunity for international leadership.

With the new institutions, it is confusing. We have spoken about how broad biosecurity is and needs to be, and how it needs to integrate. To call something a joint biosecurity centre when, in effect, it seems to be a Covid data analytics centre is slightly confusing. I have a concern that it seems an odd time to try to create new institutions when we have not had the opportunity to learn lessons yet. Will they build in inertia and overly focus on the current situation?

Lord O'Shaughnessy: You can understand how the present might end up determining the future, which would be a concern. Thank you.

The Chair: Lord Browne, I think you asked your questions earlier.

Lord Browne of Ladyton: I did, thank you.

Q103 **Baroness Symons of Vernham Dean:** This is probably directed at all three of our witnesses. Do you think that our engagement is effective internationally? You spoke right at the very beginning of the session about the importance of visibility and transparency. We are discussing very sensitive areas, or areas that can become very sensitive, as has been mentioned, with the use of all the social media at the moment, when we are talking about trying to limit international travel, and the limits that might be put on trade, and when we are talking about the difficulties with urbanisation in countries such as South Africa, where the townships are obviously rife with this terrible Covid at the moment. There are questions about poverty, climate change, all these things. Do we have a real means of discussing them effectively internationally?

Dr Catherine Rhodes: One thing that I see as a key point to reflect on right now is what we may be doing to our international standing when it comes to vaccine distribution. It has been a problem in the past; in 2009, the UK, among seven industrialised countries, had the full supply of vaccines to address the swine flu pandemic. Although we are contributing to some of the global systems for vaccine and vaccine distribution, we are doing it at a very limited level. The head of the World Health Organization pointed that out last week. He said that something like 49 million doses had been delivered in industrialised countries versus 25 in low and middle-income countries.

The point of raising that is that it can disrupt trust in the international biosecurity systems that we need. We need to think about how we would be able to gain co-operation and co-ordination with other countries if they

lose trust in us. That is a wider point, but it is a particular case that raises it at the moment.

Dr Opi Outhwaite: There are some known issues at international level that have been under discussion, and I think those discussions will be more urgent because of Covid. There are disincentives against reporting new emerging diseases and disease outbreaks, for example, because of the loss of travel or trade. How we address those will take some more difficult conversations at international level.

There are a number of international initiatives. In One Health, for example, there has been guidance on conducting joint risk assessments. Those things sometimes make their way into national strategies or discussions, but only in a very limited context—to an animal health agency, for example. The UK has outwardly embraced One Health, but it has only really acted on antimicrobial resistance, which is significant and hugely important but is not the only important issue. Sometimes there are international platforms that we can act on, but they do not get cross-government attention when they make their way into national discussions.

Dr Cassidy Nelson: With regards to international forums that discuss a wide variety of issues, the Biological Weapons Convention meets every year. It is the fifth annual review conference this year. I think that the UK could use that as a platform to convene and discuss various aspects of biological threats from the perspective of what we have seen with preparedness now. The UK could be a better leader with regard to, for example, the funding of the BWC and implementation of its points. There are various aspects that the UK could better lead on.

Q104 **Lord Robertson of Port Ellen:** I think we have gone over some of this ground before, and I apologise for that, although after a lifetime in politics I have to say that I have learned that it is only after you have said something for about the 400th time that suddenly somebody says, "That's an interesting point". It does not harm your case to repeat it over and over again.

Therefore, I want to direct your attention to the need for an organisation that links public health with animal health and with biosecurity. Do you think that President Biden's proposal, which he announced very quickly after the election, to set up a national centre for epidemic forecasting and outbreak analytics, with the task to "prevent, detect, respond to and recover from biological threats", is the model that each of you has been putting forward?

Dr Opi Outhwaite: To a point, I suppose. The language of "detect, prevent, limit and recover from" is very similar to the language of the New Zealand pandemic preparedness strategy. It is set out in a similar way. I have not read the details of Biden's initiative yet, but the language is certainly very similar and reflects a biosecurity approach to addressing pandemics. The limitation is that it is about addressing pandemics, and from a biosecurity point of view I would suggest that is only a part of it.

It is not broad enough to address the range of things that we have been discussing today.

Lord Robertson of Port Ellen: You are suggesting something that is slightly broader than even that appears to be. That seems to be the import of what you have been saying throughout this session.

Dr Opi Outhwaite: On the steps that you go through for the strategy, in my view that approach is about right, but for the range of issues that you are looking at it is not broad enough.

Lord Robertson of Port Ellen: What do you think about the Civil Contingencies Act? It is on the statute book but was not used in this pandemic because the Government, and Parliament agreed, wanted to set up something tailored for the pandemic. Do you think that it was fit for purpose?

Dr Opi Outhwaite: The definition of public emergency under the Act was probably broad enough to provide the powers that were needed. On having a duty to assess risks and the requirement to take action, I think the language of the Act is broad enough.

Looking forward, it is probably an omission that Defra is not listed under Schedule 1 as one of the first responder agencies. It limits opportunities to do joint risk assessment and to require joint co-ordinated action, so I think that is an omission. As to whether it provided a legislative basis for action, I think it did, but there is perhaps a question about whether you would then have wanted the amount of secondary regulation that would have come as a response. There certainly would have been criticism of introducing that amount of secondary legislation without much scrutiny.

Lord Robertson of Port Ellen: Do either of the other two witnesses want to add on those two points?

Dr Cassidy Nelson: One of the areas that has not been addressed yet in our discussion is the type of technological help that we could be employing to help with future pandemics. In the United States, the Bipartisan Commission on Biodefense recently released a report outlining various technologies that would be able to assist with our ability to detect and respond to pandemics, and do proper pathogen surveillance as well.

There are initiatives that think through ways in which we could address our technological capability, such as Biden's centre, which also focuses on epidemic forecasting and data acquisition and analysis. There are various ways in which we could integrate better with our laboratory network, and do better surveillance of circulating pathogens and the detection of emerging infectious diseases.

The Chair: The final question is from Lord Triesman.

Q105 **Lord Triesman:** This is the "Desert Island Discs" question—if you have to save just one of your records from the ocean. Could our experts suggest one policy recommendation that the committee should make to

the Government? What would be each of your top priorities?

Dr Catherine Rhodes: Something that fits across a range of risks is one thing. I would hope that building capacities and capabilities would assist in our response to a range of risks; they may be biological threats, they may not. It is focusing on things such as resilience and reducing our vulnerability, particularly taking that to a local level. To have adequate capacities in health systems, we need to look at whether we have local health practitioners who can help with things such as field epidemiology, and people connected enough to local communities, so that the trust we need to deal with any type of crisis is there. That also helps us with the idea that we are not just fighting the last war, and that we can do things that will hit a range of risks. That is also beneficial as regards where we put the resources. We can invest resources in things that will reduce our vulnerability to more than one risk, and that is an advantage.

Lord Triesman: May I turn to Dr Outhwaite? I think you are on mute.

Dr Opi Outhwaite: A meeting is incomplete without one muting error. To follow the "Desert Island Discs" approach, the guests usually start off with an attempt to get in something that is rejected. In that vein, I would urge thinking about a biosecurity policy that properly embraces complexity and takes a long-term view. To really drive down risks, there are big things to do with land use, consumption and climate change that need to change.

As a practical thing that perhaps would be allowed on the island, we have left the European Union, and we have a chance, as has been discussed in the House of Lords, to review our biosecurity legislation and to look at moving from a very fragmented approach that will now have some institutional and legislative gaps, because so much was governed by the European Union, to getting something that is properly integrated and perhaps a little more proactive, if not a bit more stringent, in how it addresses risk.

Dr Cassidy Nelson: I reiterate that, ultimately, for us to be better prepared against biological threats, we really do need a body or a group that will be responsible for preparedness efforts and is fully aware and capable of doing risk assessment across the range of biological threats. A response agency in and of itself will not be sufficient for that purpose. A new institute or centre that can be a convening point for that type of work could really drive the UK forward. It would need to be able to understand and look through deliberate biological threats and biotechnology and dual-use research, as well as naturally occurring diseases and laboratory accidents.

It will be a very sad outcome if we are only prepared very narrowly for a coronavirus pandemic going forward, and a new and different type of disease, or new type of biological threat, catches us off guard, in a similar way to the experience we have had with Covid-19. Such an institute or centre would, hopefully, be able to do the types of scenario planning and

exercises that identify the gaps and would fully and comprehensively address biosecurity.

Lord Triesman: Thank you all very much, I appreciate it.

The Chair: That final answer reminds us that we must not fight the last war; we must fight the next war. The evidence from all three of you has been extremely helpful in that, as well as in many other respects. Thank you very much indeed.