HOUSE OF COMMONS

Home Affairs Committee

Oral evidence: Home Office preparedness for Covid-19 (coronavirus), HC 232

Wednesday 10 June 2020

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Watch the meeting

Members present: Yvette Cooper (Chair); Ms Diane Abbott; Dehenna Davison; Laura Farris; Andrew Gwynne; Adam Holloway; Dame Diana Johnson; Tim Loughton.

Questions 732 - 773

Witnesses

I: Professor Gabriel Leung, Dean of Medicine, Li Ka Shing Faculty of Medicine, University of Hong Kong, Sir David Skegg, Emeritus Professor of Epidemiology and former vice-chancellor, University of Otago, New Zealand, Professor James Wilsdon, Vice-Chair of International Network for Government Science Advice and Professor Teo Yik-Ying, Dean, Saw Swee Hock School of Public Health, National University of Singapore.

Examination of witnesses

Witnesses: Professor Leung, Sir David Skegg, Professor Wilsdon and Professor Teo Yik-Ying.

Q732 **Chair:** Welcome to this session of the Home Affairs Select Committee as part of our inquiry into the response to Covid-19. We are taking evidence today on some of the different international approaches to border checks, quarantines and safeguards during the Covid-19 crisis. I welcome our international witnesses today. Welcome to Professor Teo Yik-Ying, the Dean of Saw Swee Hock School of Public Health at the National University of Singapore; Professor Gabriel Leung, the Dean of the Li Ka Shing Faculty of Medicine, University of Hong Kong; Sir David Skegg, the Emeritus Professor at the Department of Preventive and Social Medicine, University of Otago in New Zealand; and Professor James Wilsdon, the Vice-Chair of International Network for Government Science Advice. I welcome all of you. We are very grateful for your time this morning.

I will begin by asking some factual questions about the different kinds of measures in place in your countries and jurisdictions and your perspective on them. I will begin with Professor Teo. Could you tell us, just very briefly, the arrangements that Singapore currently has in place at the border for dealing with Covid-19, what your perspective is on them and what your view is of them?

Professor Teo: Thank you very much, Chair. Currently Singapore has a complete border closure to visitors and this is short-term visitors. Singaporeans and permanent residents, as well as holders of long-term work passes and student passes, are allowed to enter the country, but regardless of where the individual is coming in from, that individual has to stay in a Government-designated facility for 14 days. This is what we call a stay-home notice although, the name does not imply that an individual is staying at home but rather in a Government-designated facility, which typically is a specific hotel that the Government have made arrangements with. I repeat, all incoming or returning Singaporeans or holders of longterm passes are required to be in quarantine for 14 days, regardless of the point of origin, at the moment. This was announced on 24 March and continues up to today. At the moment, Singapore is in discussion with a few countries, including China, New Zealand, Australia and South Korea, on green lanes, or in the UK you call it air bridges. That is the current situation with regulations.

On implementation, individuals have to declare their travel history and checks are routinely conducted and enforced very strictly. Individuals are not allowed to leave the designated hotel. Families or friends can pass them things, but it has to go through a particular process, so there is no meeting up between the person who is returning and the visiting member, regardless of families or friends. Penalties are put in place, very clearly. There have been fines, deportations and there has even been imprisonment for people who flout some of the rules. This is the current situation in Singapore. I will stop here, but I am happy to take questions later on. Back to you, Chair.

Chair: Thank you. We will have a lot of questions about what you think the significance and the impact of that has been. Professor Leung.

Professor Leung: Thank you, Chair. I think Singapore and Hong Kong share many similarities. We currently only admit Hong Kong identity card holders, so we are completely closed to international visitors at all our ports. We have stopped all transit flights, except very recently some of those have resumed. All inbound passengers have to undergo viral PCR testing at the airport and then they wait until the results are available. If they are positive then they go into isolation at a hospital bed and if it is negative they go into mandatory 14-day quarantine. That is the current status.

We have taken some time to progressively layer on different types of border restrictions to the present, but I think we are also on the cusp of relaxing some of these measures for selected origin cities or countries. That would be the equivalent of the air bridges or the green lanes that other countries have been talking about.

Q733 **Chair:** For those countries with which you might be thinking of doing the green lanes and things, will people still have to be tested or would it mean lifting the restrictions completely for those countries?

Professor Leung: The Government have not yet announced any of those details, but I should imagine that it would be a prudent option to keep the testing in place. Exactly how you might operate that and whether it might resemble some of the so-called immunity passports idea is not known yet.

Q734 **Chair:** Just to clarify, even if people have a negative test, they still have to self-isolate at home for 14 days?

Professor Leung: Currently, but the so-called green lanes would not require those kinds of quarantine arrangements.

Chair: Thank you. Sir David Skegg.

Sir David Skegg: Good morning, Chair. New Zealand has been rather similar to Hong Kong and Singapore. Our travel restrictions have been progressively ramped up since 3 February when we first had restrictions on people coming from China. The situation at the moment is that the borders are generally now closed to all but New Zealand citizens and permanent residents. There are certain exceptions made for people who are deemed to be essential or coming for compassionate reasons, but generally speaking only New Zealand citizens and residents can come in and they are now all quarantined for 14 days in a hotel under supervision by Government staff. We did have self-quarantine for 14 days for a while, but we found that was often flouted and so it was replaced by this managed quarantining in hotels in the city where people enter.

Q735 **Chair:** Are there any discussions about changing any of that over the next few weeks or months?

Sir David Skegg: Yes, there are discussions. There have already been preliminary discussions, particularly with Australia, about the possibility of what we call an Australasian travel bubble, which would be without quarantine, and also with a number of Pacific island countries. The situation with Australia is not going to happen in the very near future because Australia has not made as much progress in eliminating the virus as New Zealand has. We think we have eliminated Covid-19 for the time being. There is still a steady stream, a small stream, of cases in Australia. There are a number of Pacific islands that appear to be free of Covid-19. I think over time there will be quarantine-free travel with Australia, Pacific countries and also places like Singapore, Taiwan and so on, I would hope.

Q736 **Chair:** Professor Wilsdon, the countries we have just heard from—Singapore, Hong Kong and New Zealand—have a very different approach to the approach that the UK has taken. Can you give us any sort of sense of the overview looking more widely internationally about what patterns you are seeing for countries that have had very tight restrictions, countries that have had different approaches, and what trends you are seeing at the moment?

Professor Wilsdon: I am speaking from the less exotic locale of Sheffield, but doing so in my capacity as Vice-Chair of the International Network for Government Science Advice. That is an informal grouping network that brings together about 100 countries, about 5,000 advisers, individuals, and some policymakers, to share understanding and intelligent insights into scientific advice processes. Through that, we have had in place since the beginning of March a sort of bottom-up policy tracking project that is now looking at in excess of 100 different jurisdictions. There are a number of other policy tracking projects ongoing around the world. We are looking at a large range of different countries at national level and, in some cases, at regional or state level and trying to understand what measures have been put in place and—in a way, more importantly—what evidence and justification lies behind those different decisions and the different mix of policies that we are seeing.

On the question of border measures, a range of different approaches have been taken. It is perhaps tempting, but I will not attempt to rank countries; at this stage it would be a bit premature. Where the UK stands out clearly is in the relatively late introduction of these kinds of measures compared to other countries, including New Zealand and others we have just heard from, and now the apparent tighter imposition of such measures at a particular stage in the pandemic. As has been widely discussed, that does make the UK slightly unusual in its approach to this particular set of questions and that raises important issues that the Committee is thinking about.

Q737 **Chair:** In terms of what other countries more widely have done or are doing, are most countries in the world following the same sort of pattern that we have heard from Singapore, New Zealand and Hong Kong?

Professor Wilsdon: Yes. I think if one was generalising, that definitely is the more common consensus approach to these kinds of measures. Clearly there are particular features of some jurisdictions and countries and there are certain approaches that one could take more easily as a smaller state or as an island and so on, but generally I think they are the kinds of measures we have just heard.

Q738 **Chair:** Are there any other countries we should be particularly aware of that have done something very different?

Professor Wilsdon: There are other countries that have not been as stringent perhaps, but if one looks across the board we are in a minority position, shall we say.

Q739 **Chair:** With the trend now going forward, are you seeing most countries starting to loosen restrictions now or only a minority of countries starting to loosen restrictions? If you look forward over the next few months, are you seeing changes likely to happen quickly or in a couple of months' time?

Professor Wilsdon: The changes are being introduced quite cautiously, for obvious reasons. What we are seeing are quite a number of examples of the kind we have just heard from Sir David Skegg of particular corridors between different countries, often of close proximity like New Zealand and Australia, where it is easier to introduce or to lift those restrictions more quickly. I think that is the move we are seeing, more than the blanket removal of such restrictions.

Q740 **Andrew Gwynne:** The impact of the pandemic on international travel has been clear to see. We have had a 99% drop in arrivals in the UK and that has been prevalent across air, rail and sea arrivals, and 58% of those were returning UK nationals. This question is to all of you. At this stage of the Covid-19 pandemic—bearing in mind you are all at different stages of the cycle—what do you think are the most important measures relating to international travel that states should be considering?

Professor Teo: In my opinion, it does not matter whether the situation is getting better worldwide. In reality it is not, because if you look at the daily increase in case counts, we are seeing much more of an increase right now than a month ago or a week ago. We are still facing an upward trend in the outbreak around the world. In Singapore we have opted to communicate very clearly the message that the travel restrictions are very likely to remain in place until the later part of this year or even beyond. What we have been talking about is essential business-related travel with specific countries. I see this as a potential trend moving forward for countries, as they decide what to do with border control measures. In Singapore it is a very clear situation that until the rest of the world has its situation contained, we will not be rushing to release the border control measures and to allow for mass market travel at the moment.

Q741 **Andrew Gwynne:** Thank you. Professor Leung, is that the same in Hong Kong?

Professor Leung: The most important question one needs to ask is what the objective of your border restrictions is. Is it one of containment or one of suppression? I do not think Covid-19—or SARS-CoV-2, as the bug is called—is containable. It is probably in virtually all countries around the world. I do not think that you would try to keep the bug out of any particular population. If your objective then moves to one of suppression, presumably there are two main reasons why you might want to do that.

First, it is to prevent further seeding of a receding epidemic or wave in your particular country or population so that as you try to control the local epidemic or outbreak, you do not reseed and then have many more chains of transmission than you are already trying to bring under control. The second option under that would be to make sure that you do not overload the surge capacity of your health system; to prevent it from essentially imploding on its own weight.

Once you have figured out what your precise objective might be, then you can gauge how steep and how serious you need to be to undertake these border restrictive measures. For Hong Kong, we have found that because we applied these border restrictions very early, from essentially the second week of January onwards up until now—they have been progressively layered on and we still to this day have not relaxed any bit of it—the most striking decline in our real-time effective reproductive number, the RT, is when we started the test and hold policy. That is that no one can come in, regardless of who you may be, until you have been tested at the port and then you go straight either into isolation as a confirmed patient or into quarantine as a potentially infectious individual for 14 days. Once you do that, you make sure that quarantine is enforced and enforceable. We have used Bluetooth and other technologies that basically monitor where the person placed under quarantine may be and make sure that they remain at home or in a hotel room.

That test and hold strategy with the compulsory quarantine has basically eliminated the contribution of imported cases into our local outbreak dynamics.

Q742 **Andrew Gwynne:** If I can follow up on that, please, Professor Leung, before going to Sir David. If—and I agree with you—the intention is to prevent the reseeding in a local population, at what point do you have the confidence that you can start to relax those measures, given that it is very dependent on what is happening in other parts of the world?

Professor Leung: Hong Kong, as with Singapore and London Heathrow, is an international air traffic hub. When you try to create green lanes or travel bubbles or whatever, one needs to be extremely aware of the complex web of interconnections, transits, as well as connections beyond just air travel where you have sea and land connections. That kind of complex web needs to be taken into account if one is thinking about any kind of travel bubbles or air bridges.

Secondly, in the case of Hong Kong we are very aware of the fact that there are essentially three control modes for outbreak control available to Government. One is border restrictions; the second is what I call quarantine and isolation, which are wholly dependent on testing and tracing; and the third is physical distancing, which is the most socially and economically disruptive, ranging from school closures to complete lockdowns. Once you have decided to relax any one of those measures or

a part of those general categories, one should be very careful in doing simultaneous relaxation or lifting of the other two general categories. If you see a recrudescence in your infection numbers or your RT it would be very difficult to sort out which relaxation or which lifted measure had been primarily responsible for that recrudescence.

I think those systematic almost experimental type of modes should be pursued if one is thinking of turning the control knobs either up or down, but do not turn them up or down simultaneously.

Sir David Skegg: New Zealand is in a somewhat different situation from Hong Kong and Singapore. After a short delay, New Zealand decided on a strategy of elimination. In late March we were having nearly 100 new cases every day and it was getting beyond our capacity to contact-trace effectively. We went into a very rigorous lockdown but a fairly short-lived one and then we scaled down, but now we have had no new cases of Covid19 for 19 days in a row. There are now no active cases remaining in the country and it is more than six weeks since the last case of community transmission. From the beginning of this week, all restrictions have been removed on social distancing and so on. Life has really returned to normal except that we have these very rigorous border restrictions. In the city of Dunedin where I live, there will be the first post-Covid professional rugby game in the world, I think, and it will be a packed stadium.

But I was interested in Professor Leung's point about the three kinds of precautions. The price that we are now paying for having social and economic life returning to normal within the country is that we have to maintain rigorous border controls. Of course, that is a big price to pay for a country that has a tourist industry and depends on trade, but everything now depends on us maintaining that safeguard at the border. But having gone through a lot over the last few months, I think the New Zealand population is very keen to enjoy what we have achieved and not to put that at risk too quickly.

Q743 **Andrew Gwynne:** If I can follow up on the balance being struck between stopping the spread of the virus and returning to normal economic activity, how long do you think these measures will have to be in place in New Zealand in order to have the confidence that you are not going to reinfect the population?

Sir David Skegg: I think that depends on what happens in other countries. If other countries get on top of the infection, we will be able to form these bubbles, as we call them, for quarantine-free travel, but another possibility of course is the development of an effective vaccine. The third possibility would be serological antibody tests that would enable people to have some sort of passport that would show that they are most unlikely to bring the infection in. At this moment it is a new disease and there are a number of uncertainties about this.

Andrew Gwynne: Thank you. Professor Wilsdon.

Professor Wilsdon: I am a policy analyst, not an epidemiologist, so I defer to the previous answers and would agree with much of what they have said. If one then returns to the UK case and takes on board Gabriel's point, what we perhaps do not have is the same degree of clarity as to the role of these measures in the context of the broader strategy and the different elements and measures across the board that the Government are taking. I think that requires at least greater transparency instead of indications of the science as a sort of singular thing followed by somewhat shifting policy responses.

Q744 **Andrew Gwynne:** Why do you think the UK Government were so slow to come to the position that they have come to now in imposing a quarantine on 8 June?

Professor Wilsdon: I am not able to answer that any more than having read the various accounts and papers from SAGE that have now been released and trying to understand and unpick exactly what has gone on. Clearly there was a strong argument that community transmission was at a level within the UK that some of those measures would not have been effective, and that seems to have been the advice that was issued from SAGE on 22 March or whatever. I am not clear myself what new, fresh advice they are giving to support the policy changes we are seeing now. Unless I have missed it, I have not seen an updated statement from SAGE to support the measures that are now being introduced. It may be that that advice exists and has not yet been published, but as we have seen through the course of recent months, the importance of transparency in the advisory process is clearly paramount at this point.

Q745 **Andrew Gwynne:** Does the lack of strategic thinking behind this, unlike the case of New Zealand, worry you?

Professor Wilsdon: I think it is the apparent lack of strategic thinking. I am sure there is strategic thinking going on. The issue always in advisory systems is the interface between the advice and political decision-making, and that is the thing that is very tricky to discern from the outside and which of course attracts the greatest commentary and speculation. Where we have had problems arising here—not just with respect to border measures, in many other areas too—has been at various points an overly simplified, singular account of the science as supporting simple decisions rather than greater acknowledgement of the plurality of advice and evidence, which clearly exists, as we are seeing from other sources. There is also the messy interface between the scientific and the political, which is at the heart of these sorts of situations.

Q746 **Adam Holloway:** Having heard about New Zealand and Singapore with test and hold, we are hearing now that people in the UK should be able to take

some holidays and hearing from the airlines about how all this is manageable. How does that look from the perspective of people in Asia?

Professor Teo: Thanks very much, Adam. If I got your question correct, it is around how do the people feel or even the airlines feel about the situation right now in my part of the world.

Adam Holloway: No, the question is what is your perspective, looking at the UK, where there are a lot of people clamouring for people to be able to take summer holidays in countries with similar rates of infection and whether you think this sounds like a good idea?

Professor Teo: No, it does not sound like a good idea. If we look at the current situation in many parts of Asia right now, the actual numbers of infected cases per day for many countries in east Asia and some parts of south-east Asia are very low, but regardless of that, many of the Governments are not looking at mass market travel for tourism. The discussions that we have heard from Hong Kong and New Zealand are centred around business essential travel with green lanes and air bridges. For example, Singapore announced a green lane arrangement with China last week and we have some of the details. It involves testing on both sides; it involves business travellers but not mass market travellers. Even though our numbers per day are very low, we are still not talking about mass market travel even between countries with very similar outbreak characteristics at the moment.

Professor Leung: I think that it would be premature to allow any kind of mass market holidaying simply as a precautionary measure, thinking about the consequences. I am not going to repeat what YY already detailed. If one thinks one step ahead: what if you get sick while you are on holiday; what about insurance coverage; who is going to pay for the hospitalisation; what happens to the rest of your family or your friends who have been travelling with you? It is not at all clear about the responsibility and the coverage and the availability of care. It would quite likely be different from what you might expect if you were at home and fell ill with Covid-19. I think that is an additional consideration, even if it were possible and permissible to do so.

Secondly, let me say again that I think testing capacity would need to be massively ramped up for any kind of cross-border travel, even within these travel bubbles or air bridges, first and foremost, not least from an occupational health point of view for air crew and port personnel who come into intense and frequent contact with travellers from everywhere. Then of course there are the testing arrangements and, importantly—and it is not really talked about yet—the cross-border mutual tracing operations. Tracing within national borders between different provinces or states or counties is complex enough. You can imagine how non-trivial cross-border tracing can become if you are talking about these kinds of air bridges.

Sir David Skegg: I find it hard to comment without seeing the scientific strategy for your new policy. Indeed, it is not clear to me what the UK strategy is for dealing with this disease. Professor Leung talked initially from the point of the individual: is it a wise thing to go and have a holiday in Europe, say? But I think the other question is from the point of view of the United Kingdom's health system: is it going to make things better or worse? Someone could argue that if they go and spend two weeks sitting on a beach on Greece they are less likely to become infected than if they stay in the UK going to work in the normal way. That is not so good for Greece, but from the UK's point of view it does not seem very logical to me to be requiring a 14-day quarantine for people coming from countries with a much lower incidence and prevalence of Covid-19. It is hard to answer the question without seeing the precise rationale for the policy that is being introduced now.

Q747 **Adam Holloway:** Can I just add that the air bridges are not currently the Government policy at all? I am just saying there is an awful lot of lobbying for it right now.

Sir David Skegg: I know about the air bridges, but I was talking about if someone were allowed to go now and wanted to come back they would have to quarantine, as I understand it, for two weeks.

Chair: Professor Wilsdon?

Professor Wilsdon: No, I have nothing to add on that question.

Q748 **Chair:** Sir David, can I follow up? Does that mean that your scientific advice would be to other European countries with a lower infection rate not to allow British tourists to come, but not to be so worried about the restrictions for Britain for people arriving?

Sir David Skegg: Yes. If they are coming from countries with a lower prevalence of infections I think that is less of a problem for Britain, but of course if your policy is to try to stamp out this infection, obviously every case counts. I have not seen that clearly enunciated and so I would not see it as your highest priority. Coming back to what Professor Leung said, I think your highest priority should be to be testing much more extensively and to be carrying out rapid tracing and quarantining of contacts.

Chair: Professor Teo, do you want to come back in?

Professor Teo: Yes. I thought Sir David gave a very clear outline of individual decision-making and country decision-making. I thought I would add that from Singapore's perspective, from the health system perspective, until there is formal green lane travel or air bridges arranged, the present stance for the Singapore Government is that they will rescind any healthcare coverage and insurance for anyone infected with Covid-19 if people voluntarily travel out of the country during this period. This would stay on for at least the next three months. I repeat that right now all Singaporeans and permanent residents, if we get infected, have full

insurance coverage. All our medical bills are provided for, but the Government made it very clear that if we voluntarily travel out of the country during this period we forfeit our claim to subsidised or full coverage of the healthcare bills. I thought that is a very important point I would raise.

Q749 **Dehenna Davison:** Thank you to our witnesses for their time today. We were told that in March of this year imported cases represented only about 0.5% of total UK Covid cases. Given that community circulation was ongoing and quite widespread by this point, this is why border closures at that point would not have achieved very much. Do you agree with that particular logic and do you think this is the most appropriate calculation to use when deciding on border measures? Sir David, I will go to you first.

Sir David Skegg: I obviously cannot comment on the estimate of the proportion, but I think the point is that these border measures would be most effective if they were done very early. As in the case of New Zealand, all of your cases were originally imported—this disease did not originate in the United Kingdom—so the earlier the better. I think it would have been much more effective if you had done this in February, but it may still be worth doing now. It all depends on what the strategy is and that is not clear to me.

Professor Teo: I concur with what Sir David has mentioned and I would like to bring it back to what we experienced in Singapore. We had two waves of importation, one in the middle of January from China and one in the middle of March from North America and Europe, and we are still struggling to contain some of the effects from the second wave of importation. I agree with Sir David that if there is a strategy right now it is not too late to put in place border control measures that are strictly enforced and regulated.

Professor Leung: I think that the answer is very obvious. If you look around the world, the places that have imposed border restrictions earlier tend or have tended to come out much better in the local outbreaks. In the case specific to the UK, in the just released study of sequences of more than 100 in the UK—very careful work done—you can see multiple introductions from a variety of different places of origin. I think that study of—

Q750 **Chair:** Sorry to interrupt you. Which study are you referring to, Professor?

Professor Leung: That is looking at genomic epidemiology of the samples collected from infected individuals. That was released in the last 24, 36 hours in the UK. What that shows, of course, is the origins of essentially each and every sample, and if you refer to the findings there you see multiple, multiple introductions over a fairly long period of time. I think that the counterfactual of if you had imposed border restrictions earlier on is perhaps that the picture would have looked quite different.

Chair: Thank you. Professor Wilsdon, do you have anything to add?

Professor Wilsdon: No. I agree fully with Sir David and Professor Leung. Clearly this is one of a number of areas where, with the benefit of hindsight, we perhaps wish we had moved faster. I do think though, as David said, that the imperative thing at this point is clarity of the place of these measures within a wider strategy and mix so we understand why we are making the restrictions at borders that we are and how those will play into the broader strategy.

Q751 **Dehenna Davison:** There is a very fine balance between public health arguments and wider economic arguments. Given the economic damage that could result from border restrictions, what do you think is the most appropriate balance between public health and those economic considerations as infection rates decline globally?

Professor Teo: In Singapore we have that discussion as well about a balance between public health and our containment of the infection. The reality is that Singapore, like Hong Kong and London, is a travel hub. Our passenger flows in a year are very similar, so any border control measures will affect our economy, particularly given how much Singapore depends on international trade. The conversation that takes place with the Government is very clear. If we do not close our borders and we allow trade and people movement to continue unregulated, what would happen? We saw evidence to suggest that there would be multiple waves of reinfection coming in and that would lead to a situation where Singapore would have to implement additional phases of closures.

Those lockdowns and closures will impact the economy in a much deeper and more significant way because it will affect small and medium enterprises and not just those that depend on tourism and international movement of people. International trade in Singapore still continues despite the borders being closed, so that is where we have to look at what is the overall intention of the border controls from the economic perspective. We know for a fact that border controls will have a significant economic impact on tourism and any aviation and related industries, but it does allow the rest of the economy to continue when the situation within the country is contained.

Sir David Skegg: I agree with my colleague from Singapore. Our Government decided very early on that trying to eliminate this virus was not just best for the health of the people, it was also best for the economy. I think it is a false dichotomy. Human life has a value and this is a disease that kills about 1% of the people infected. Economists do put a value on human life. I think the sense that there is a choice between health and the economy is misleading and certainly, as with Singapore, New Zealand continues to trade very actively. Of course our tourist industry, which is one of our biggest earners, is on hold—international tourism—but there are enormous benefits, not just for health and wellbeing, but also for the

economy in being able to function normally as a society. I think it was the Sanitary Commission in Victorian England that said, "Public health is public wealth".

Professor Leung: I would like to make three points. First is a general point, that this is always a three-way tug of war between health protection, economic preservation and social consent or the emotional wellbeing of the population. I do not think that the three-way tensions are going to go away any time soon regardless of what stage of the pandemic we have come to.

Secondly, it is important to bear in mind—and we have to be fair—that it has always been the de facto position of the WHO and many national Governments before Covid-19 not to impose any border restrictions in most circumstances. But Covid-19 has proven itself to be special because of the characteristics of the transmission and also because of the overwhelming magnitude.

Thirdly, in terms of the interrelations between different travel destinations, whether it is for business or for leisure, it is not what you do unilaterally that matters most. It is what everybody else whom you trade with, and receive and send tourists from and to, that matters. If you were the most open port, but all the other countries with which you have relations all impose very strict border restrictions then it would not do you any good to be very open either.

Finally, if you look at the evidence so far of Covid-19, as well as refer back 100 years ago to the 1918-1919 pandemic, there is good evidence to show that those places that imposed heavy or even heavy-handed measures early did better not only in terms of health protection, but also because they have been shown to have done better in terms of economic recovery, both in speed and in magnitude.

Professor Wilsdon: Again, I would agree entirely with the previous answers. Clearly these are going to be difficult choices for every Government right now. It is incumbent on our Government here in the UK and others, where possible, to be as clear as possible, as transparent as possible, about the mix of factors at play, the different sources and types of evidence that have been drawn on in informing that mix, and the weightings that are being applied in the ultimate policy decision process, because that is down to the politicians rather than the scientists. Then they should acknowledge continued uncertainties and flexibility to adapt as and when future waves of the pandemic arise and so on. We are back again to the same sorts of points about transparency and clarity of strategy that are important.

Q752 **Tim Loughton:** A couple of points initially to Professor Teo and Leung because obviously we are interested in why the UK Government have brought in the quarantine in the UK, as they have, later than everybody else. One of the reasons given as to why the UK was different and why it

had a much bigger adverse impact economically is the fact that the UK, and particularly Australia, are major international hubs. It is something we share in common to a lesser extent with Singapore and Hong Kong. How did that reflect the thinking in Singapore and Hong Kong about the much tougher ban here? Have you looked at ways whereby you could still deal with transit passengers in some form of bubble, keeping them separate from those people who connect to Hong Kong, Singapore or wherever?

Secondly—perhaps all of you will take this together—Singapore initially had

a phased ban and you were changing quite regularly those countries that were on a blacklist to be subject to restrictions or were allowed no entry at all before you went to a blanket ban. Do you see yourselves going back to a sort of green list, whereby you take people coming in from certain countries but, subject to experiencing a flare-up in those countries again, putting them back on a red list or whatever you want to call it? Professor Teo, I will go to you first.

Professor Teo: Two questions there. The first is around transit passengers and what the arrangements are that Singapore have in place to at least allow for transit. Last week was when Singapore had started allowing transit passengers to depart from our main airport again, but it is very clear that transit passengers have to keep to certain rules. They can come from anywhere in the world, but they must maintain social distancing. There are a number of strict regulations around where they can go in the airport, and effectively the airport has been divided into zones. Through that approach, the people working in the airport are considered front-line workers and they are aggressively tested and swabbed regularly to make sure that they remain infection-free as much as possible. There is a degree of PPE usage among airport front-line workers as well. But in terms of transit passengers, this has resumed since last week. I thought I would address that.

The second was around Singapore's phased ban, and you are absolutely right. In the very beginning we banned travellers, we restricted travel from parts of China and then the whole of China and increasingly South Korea, Italy and Iran. The progress of our border control measures were aligned with the development in the rest of the world. The easing of these measures is exactly along that same principle as well.

We talk about the green list and we have a green lane arrangement now with China. We are in the process of discussing with Malaysia, Australia, New Zealand and South Korea. It is likely, in my opinion, that we will move towards a situation that this green list will continue to grow beyond China, but at the same time I must emphasise that the discussion at the moment is still centred mostly around essential business travel. The green lanes are not for mass market travel or mass market tourism at the moment.

The communications from the Government have been very clear on this point. That tourism in its mass market approach is likely to be restricted. If for some reason one insists on leaving the country not for business but for some form of tourism, you are not forbidden from leaving Singapore. If I am a Singaporean and I want to leave today I can, but I have to forfeit certain rights when I return. That includes the 14-day quarantine, regardless of where I have been. It also means that I forfeit my claim to national insurance for any coverage of Covid-related illnesses.

Tim Loughton: That point is interesting. You do not get free healthcare when you come back if you are then dealing with Covid?

Professor Teo: At the moment, if I am infected with Covid-19 I receive free healthcare in Singapore regardless of any complications, but the moment I choose to leave the country, if I get infected, when I come back I have to pay the full bill as a private patient for my Covid-19 care in Singapore.

Q753 **Tim Loughton:** That is interesting, very controversial. If you are considering freeing up to further countries, although not on a mass tourist scale, what do you think the rationale will be based on? Would it be the outlook prevailing in those countries? Would it be the fatality rate, incident rate or what consideration will put a country on the green list rather than the red list?

Professor Teo: It will depend on a number of factors. First, it is not just a matter of what is the case count, the rate of infection or the degree of infection in the country, but it is more about the processes and the protocols in place in the country around aggressive testing and contact tracing—the speed at which an infected person will be identified, and the surrounding contacts will be identified and isolated as well. I see the mutual trust and confidence in each country's processes as absolutely critical to allow some of this green lane or air bridges arrangement.

Q754 **Tim Loughton:** That is very clear. Professor Leung, could you also perhaps take on the issue of testing at airports? Initially we saw a lot of the Asian airports were having thermometers taking temperatures and other basic things like that. Did they have any great significance? Because they are not very accurate and that was one reason why again the British Government did not institute any sort of screening at UK airports.

Professor Leung: Let me just address that question first. Temperature scanners at airports have remained in place since the time of SARS. They have never been taken away so it is not a special measure in Hong Kong or in many Asian airports. That is not something new just for Covid.

Whether they are effective, modelling studies—a couple from the London School in the UK—have shown that they are quite leaky; that is they are not entirely reliable. But that said, if you look and go back to the second and third week of January, and remember during that time within the first

two weeks of January we were looking at official case counts from Wuhan in China of somewhere around a few dozen, then temperature scanners at airports in Bangkok and in Tokyo started picking up anecdotal cases. These were then isolated in hospitals, tested and confirmed. That is how they were picked up. Clearly they certainly had an effect there and were able to act as sentinels to warn us to step up further measures at the border.

Going back to your original question, Hong Kong started border restrictions for the province of Hubei, which is where Wuhan is, back in the third week of January, then for the whole country of mainland China and then progressively to northern Italy, to Iran and then progressively to the entire Schengen zone; of course up to now everybody. Like Singapore, we have just very recently relaxed the transit policy and that is where we are. We are now working very hard towards the lifting phase of some of these border restrictions with similarly low-prevalence countries and populations.

For travel between mainland China and Hong Kong, we do not have an immunity passport per se but a health code, so that it is easy, for example, in the Greater Bay Area—that is in the Pearl River Delta—to travel between say Hong Kong, Macau, Shenzhen and Guangzhou. These would be on the immediate list of that travel bubble that we are proactively considering, and I believe the measures are imminent.

Q755 **Tim Loughton:** That is interesting, the scanners having been there all the time. It is very much portrayed to us over here that they have been brought in as a result of coronavirus. Is it the case for not just Hong Kong but most of the other Asian countries we have been talking about that scanners have been in place ever since SARS as a routine measure?

Professor Leung: In many Asian ports, yes. That is how cases were picked up in Bangkok and in Tokyo in the second and third week of January. It is not just ports. I could not go into a commercial building or any kind of shopping mall, hotel or public place in Hong Kong now or anywhere in China and many parts of Asia without passing through a temperature scanner.

Q756 **Tim Loughton:** Sir David, do you want to comment on any of those points? With New Zealand you are not really a hub, other than you are the end of the line. But you brought in the 14-day self-isolating for all your arrivals, including New Zealand citizens, way back in March, which was quite early. What was the thinking behind that as well? On top of these other health checks we have been thinking about, can you say whether New Zealand has done any of those?

Sir David Skegg: We have not been like the ports mentioned in Asia. It has not been normal practice for temperatures to be monitored at airports or in the cities. But, yes, on 16 March all travellers were told they would have to self-isolate or self-quarantine for 14 days. It did not work very well. Naturally tourists coming to New Zealand did not want to spend 14 days in a hotel in Auckland. They wanted to go to Queenstown or

somewhere, so within a day or so people were seen getting out of campervans and there was considerable concern about that. It was only three days later that the borders were closed to all but New Zealand citizens and residents, but they were still required to self-quarantine for 14 days.

Q757 **Tim Loughton:** What is going to happen now? Are you opening up on a green list system, in which case you will not be seeing any UK tourists for quite a while? How are you progressing?

Sir David Skegg: Nothing is going to happen in the immediate future, but our Government are in discussions, particularly with Australia and with some of the smaller Pacific Island countries. I am sure in the future—there are obviously preliminary discussions with countries like Singapore and territories like Hong Kong—as time goes by we will develop relationships with other countries. But at the moment we are in an unusual situation.

We appear to have eliminated the virus and we want to enjoy that and make the best of that. We do not want too many people bringing it back in.

Tim Loughton: You are making us all feel very envious in the UK.

Sir David Skegg: I hope it lasts.

Q758 **Tim Loughton:** We hope we get it over here. Professor Wilsdon, do you want to comment on any of those points as well, where there have been examples of best practice from the things we have heard? The example of Singapore, which are you aware of, about health cover being forfeited, is that unique to Singapore or have you seen it in other states?

Professor Wilsdon: I do not know the answer to that question. I can certainly look through the tracker that we have. Definitely New Zealand is clearly up there and has been widely celebrated for its success to date. There are other less discussed examples. We have a nice profile in Jamaica's approach to this, which has also been very successful. They also were proactive in how they imposed both border measures and other elements of testing, tracking and tracing.

There is an emerging cadre of countries. I do think, though, that one has to caveat that with the fact that we are potentially only in the first wave of something that may have some distance to run. Let us hope, as Sir David says, that New Zealand retains its position, as it were, but it may be a bit early to call the precise order of success and failure in addressing this pandemic. It is very important that we do understand the different measures that have been taken and we monitor them, as we and others are doing, but it will take some time before we can draw hard and fast conclusions about overall performance.

Q759 **Laura Farris:** My first question is just a short one for Professor Leung. I wanted to ask about the report that you refer to that had been published in the last 24 to 36 hours, which showed—I think you called it—the genomic epidemiology of different cases of the virus that have occurred in the UK. I wanted to ask you two questions on that. First, does it significantly differ from other countries that you are familiar with and, if so, in what ways and what kind of learning point should we be taking from that?

Professor Leung: I have not read the report myself in any detail, so I

must confess that I cannot speak and should not speak on behalf of the authors, who are UK-based.

Secondly, the only other major comparable set of reports that I am aware of are from the United States. I am not entirely sure that it is vastly different from the UK in terms of the preparedness or the timing of imposing strict measures either at the border or within the country itself. For example, if you look at the northern California study or report, you also see multiple introductions from many different places; you are seeing similar types of introductions. If you look at a smaller study or preliminary findings from northern Italy you also see that there is probably a much earlier introduction and from a wider net of exportation countries or locations, as one could tell without that kind of genomic information.

Q760 **Laura Farris:** My wider question is, Professor Leung, I think it was you who said there were the competing pressures of health, the economy and social consent. I wanted to ask you a little bit about social consent-type issues because there is pressure in the United Kingdom against a 14-day quarantine. I wanted to ask all of you: if the United Kingdom had an alternative policy of testing on arrival and a seven-day quarantine, maybe with further aggressive testing in the days afterwards, how effective would that be? I know that 14 days is the quarantine period that is recommended by the World Health Organisation, but I have read repeatedly that most people will become symptomatic within seven. Would you be able to make a projection as a sort of comparator of how effective that would be? Sir David, perhaps you could go first.

Sir David Skegg: I would find it hard off the top of my head. I would be interested in my colleagues' views. Obviously it would be less effective, but it would have some effectiveness. Again, I have to come back to the same old refrain: it depends what you are trying to achieve.

Professor Teo: It is what Sir David mentioned, once you reduce the time from 14 days to seven days those people who are not happy with the 14 days will equally not be very pleased with seven days. You would not serve the purpose of pleasing them anyway with seven days versus 14 days. If you cast a net at only seven days there will be some leakages and that is the cost that you will have to bear when you decide that, "Seven days is the limit that I will quarantine someone for and then after that I will let the

person interact freely in society". Clearly it is a compromise between what you are comfortable with relative to the leakage that you expect. But I do not see the difference between a seven-day quarantine and a 14-day quarantine because in many societies that have issues with social consent, just the mere fact that the Government are going to keep them locked up, regardless of whether it is seven days or 14 days, goes against their belief already.

My point about societies in Asia is that the community-spirited nature does mean that we are a lot more forgiving towards having to stay in isolation for 14 days, but I have to say that it is equally undesirable because there are people within Singapore who are still very vocal against quarantine. But that degree of unhappiness is much lesser compared to the situation in the UK or in other parts of Europe.

Professor Leung: One has to be clear and understand where the quarantine period comes from. The quarantine period comes from the incubation period distribution, that is, if you were infected how long would it take you to show symptoms? Essentially it is 14 days because about 95% or more of people who are infected with Covid-19 would show symptoms within 14 days. That is where the 14-day quarantine period comes from. If you place them under a 14-day quarantine, 95% or 99% of people, if they were truly infected, would already fall sick and you would then be able to tell whether they should be released back into the general community or whether they might need treatment or further home isolation so that they could get over the acute illness without spreading it to anybody else. That is where the quarantine period comes from.

You are correct to say that it is not seven days. Six days is the average, or the median, incubation period—by definition, 50% of people who are infected would have shown symptoms by day 6. That is where that sevenday or week-long quarantine comes from. But it is not 90%, it is not most of them, it is half of them.

If you again look at some other studies, which are based on some of the early data from Wuhan in China, where they have done very good isolation and massively ramped-up testing, you could infer that most of the infections take place two days before anybody first shows symptoms and for about four or five days after they show symptoms. It is during those critical seven days that, if you were going to pass it on and infect somebody else, that you might do it.

I suppose you could construct a scientific rationale and say that if you test everybody before a flight, then they go on a flight, if you then put them in a seven-day quarantine but on day 6 of that quarantine you test them again and they are negative both times, then probably you would have been able to cut down the risk of them being infectious, and therefore infective to others, by a considerable margin. Of course it is not as good as

14-day quarantine, but probably quite a bit of the infectivity would have been curtailed.

Professor Wilsdon: Again, I have nothing to add to Gabriel's superbly clear exposition. When it comes to the UK policy position, this is another area where one would hope that these different models are being run and produced by relevant parts of a staged process and feeding into Home Office decision-making. Therefore we can be given more sight of the thinking that lies behind the policy. It is that key at the moment that is causing a fair degree of controversy and debate, but the other witnesses have answered well on the science of this.

Sir David Skegg: Could I just make one more comment? The other point about this is it is not just a matter of the number of days but also how effectively or consistently the self-quarantine is carried out. As I understand it, people would be able to use public transport to go from the airport to their house. They are going to be allowed to go out and buy food, which I presume might mean going to the supermarket. I do not think there is any plan to test them again. This is only one issue. The other issues, which are probably more important, is the extent to which this selfquarantine is going to be consistently applied.

Q761 **Adam Holloway:** I want to return to something Tim touched on. This question of aeroplanes, if I was trying to catch this thing I could think of nothing more conducive to doing it than sitting on a packed aircraft. What do the panel think about that in the context of air bridges and so on?

Professor Leung: You are absolutely correct. There are very few studies that have been done on Covid-19 in terms of transmission onboard, but one has to bear in mind that, yes, if you wear sufficient PPE or personal protective equipment, including face masks, as well as making sure that hand hygiene is maintained as much as possible and also make sure that communal toilets are maintained more so than otherwise, and perhaps fairly well spaced out seating and staggered meal times where people would of course have to take their mask off, coupled with sufficient air changes on board, one can try to minimise some of that risk, but you are absolutely correct.

Any kind of closed environment where you have a potentially infectious or infected person is high risk, and that is why earlier on I suggested that if you have to do that then the time of testing is not on arrival. The time of testing should be 24 hours before you board so as to protect that journey in and of itself as well.

Professor Teo: I have nothing further to add to what Gabriel has mentioned.

Sir David Skegg: The other important factor is how many other people on that plane are infected. If we are talking about air bridges between

countries where there is a very low level of infection, that will be a completely different situation from travel between centres where there may be a number of people on the plane who are infected. The key point is that we need to try to get rid of this virus, to suppress it or eliminate it. That is the fundamental aim that we should have.

Q762 **Adam Holloway:** My implication was that could an aircraft be almost an incubator? If you have one person in the supermarket with it, maybe no one in the supermarket would become infected. If you are on an aircraft and have one person on it, could you have a great number of people infected? It just strikes me as the most unhealthy close environment that most of us ever get into in our lives in terms of a public space.

Sir David Skegg: As Professor Leung pointed out, it is potentially a great way of transmitting not just this virus but other infections as well, that people are in close proximity with air being recirculated, using the same toilets and so on. Yes, I do not know whether that is the worst situation, but it certainly is worse than walking into a supermarket, I quite agree with you.

Q763 **Chair:** Just to follow up a few of the points that we have just covered earlier, going back to some of the early scientific advice that the UK seems to have considered and rested a lot of its decisions on, which obviously seems to be very different from the approach taken in other countries. One of the key things was early on in February that there seems to have been advice that reducing imported infections and taking substantial measures to do so would only have delayed the onset of the epidemic by around five days, a 50% reduction of imported infections would have delayed the onset by five days, that 75% would have reduced it by 10 days, 95% reduction

would have bought maybe a month. But this would have required such draconian restrictions both in terms of economically and people arriving back home that the Government decided not to introduce those restrictions. That is obviously very different from the advice and the conclusions that each of your countries have come to. Do you think that that is flawed advice?

Sir David Skegg: If this pandemic will have taught everyone one thing it is that acting early is absolutely vital and that when you are dealing with an infection that spreads exponentially, every day counts. New Zealand was only a week or two behind the UK and Italy. It is hard to be sure because there was less testing going on in the UK so one cannot compare the data directly, but we were heading in the same direction. It is fortunate that our Government did take early and decisive action.

Obviously, those decisions are not easy, but a week or two weeks or three weeks is very important if you are getting other measures in place to control the infection. With the wisdom of hindsight—and it is easy to be smart after the event—the delays in imposing border restrictions, but even

more so in ramping up testing and contact tracing and imposing a lockdown, help to explain the situation that the UK is in today.

Professor Leung: I have learnt two things during my years dealing with epidemics. One is you need to consider the contextual factors, which is every place, every country is different and there must be a whole set of different considerations and background with which any Government would work. I hesitate in putting on the retrospective scope, which is always 20:20, as Sir David has said, with those kinds of contextual considerations. I just raise one very important one, which is the experience of SARS. You can see that the countries and places that have gone through SARS have all, almost uniformly, acted early and much earlier than their neighbours, so it is not geographic, it is not even political, but it is that indelible societal imprint of SARS. I give you the example of mainland China, Hong Kong, Singapore, South Korea, and if you compare Canada's response with the American response, I rest my case.

Secondly, it is also contextual in relation to the other two control knobs that I referred to during my opening remarks. Border restrictions is an important control knob, but it is not the only one. The other two sets of interventions, that is test/trace, leading you to be able to execute quarantine and isolation and physical distancing. If those two were taken into account and if those were dialled up early on, even though your border measures may not have been as restrictive, then the result could very well have been different. Similarly, if you had dialled up your border restrictions relatively early on but left the other two unattended, I am not sure that you would get a very good picture either.

Professor Teo: I believe the recommendation around five days' delay assumes that border restrictions were the only measure in the absence of other public health measures, but Gabriel mentioned it very clearly, that if one just assumed that we would put in border control measures without accompanying it with other forms of public health measures, such as track and trace or even social distancing and so on. We saw that very clearly in Singapore because our first wave started in the middle of January and border controls, again some of the worst affected countries at that time—that includes China, South Korea and Italy—that successfully reduced further importations so the country only had to focus on keeping the local situation contained without worrying about whether there will be additional importations for some of these countries.

We were on the lookout for further importations and that is why we started quarantining people for 14 days when they came back from specific regions, including China, South Korea, parts of Italy and so on. We did quarantine people for 14 days. But otherwise border control on its own, perhaps it is true it will only serve to delay the outbreak by some time, but I do not agree that border control measures with accompanying comprehensive public health measures will not contain the situation. My

view is border control measures with the right appropriate public health measures will help to contain the situation and we have many countries that effectively have shown that as a fact.

Professor Wilsdon: Again, I agree with everything that the three previous witnesses have said. Clearly, as others also said, with the benefit of hindsight, one is forced in this area—as in others—to ask how it was, given that the UK considered itself to be very well prepared for these kinds of eventualities, that in the way that this played out through February and March we ended up not moving as swiftly as other countries and clearly this has attracted a huge amount of comment.

On the international side, one of the very interesting questions is the extent to which—Gabriel and others may be able to comment on this—the SAGE process was or was not drawing explicitly on insights and advice from colleagues in Asia, particularly in countries that have gone through that very defining experience of SARS because there definitely does seem to have been at least not as much visible input in the evidentiary mix of international perspectives as one might have expected in a situation like this.

Q764 **Chair:** There seems to have been two things that were believed. The first was that stopping all flights or having much stronger border restrictions would itself only lead to a limited delay. The second thing that seems to have been believed was that the benefits of that delay were outweighed by other economic considerations. It was just not a significant gain. Can I just ask you about that first bit? Your countries or considerations, did people also take the view that these extensive border restrictions would only lead to a small delay, it is just that they thought the benefits of delay were better? Or did they take the view that the impact of these border restrictions would have a much greater impact on delay or the spread of the virus?

Professor Teo: In Singapore it is clearly the latter, that we believe that border control measures will help to reduce the degree and the extent of spread of Covid-19 in Singapore. We had many members of the public asking the Government to put in place further restrictions as early as January. They were asking the Government, "Why are we still allowing some of the people to come in?" and that we should have put in place even stricter and more stringent travel restriction earlier.

Professor Leung: Yes, again with the memory of SARS, the Hong Kong people were in fact pushing, encouraging and demanding Government to impose stricter and earlier border restrictions. In fact, it was not a difficult decision, especially as when we imposed our border restrictions it was at around the same time that Wuhan and surrounding municipalities imposed a cordon sanitaire around itself. Then the rest of the mainland of China put up border restrictions around every single province and, within provinces, every single city and town. It was not an unusual thing to do but, as I said,

I have been humbled by many outbreaks that I have had the privilege of dealing with over the last two and a half decades. This is a very contextual kind of decision and I do not think you can force or impose or encourage even that kind of social consent or, for that matter, demand.

Q765 **Chair:** This was not just about social consent, this appears to have been the conclusions of scientists, first of all that the impact would be very limited, in terms of the delay achieved would be very limited. Then obviously, secondly, it is a wider consideration of how that balances with the economic impact. But that first bit, the first thing they seem to have concluded seems to have been what the scientists concluded at the time. My sense is this was not just the public in Hong Kong and Singapore had an appetite for stronger restrictions, you also felt, as your public health assessment at that time, that those restrictions would have a bigger impact simply than a three or four-day delay in the epidemic.

Professor Leung: Yes, I think so. I am collaborator, friend and colleague with many of the members of SAGE and the various subcommittees, but I think that us in Hong Kong, being right across the border from mainland China, of course had to make that decision or that public policy intervention call early on when there was very little empirical science. It would have been a lot easier to make that scientific assessment—even though you may not have had plenty of empirical evidence—because you have that lag and you see it sweeping from east to west. I do think that the science is or was probably there, although not definitively, but it would have been a much more difficult policy call if one were to follow strictly empirical science but not invoking the precautionary principle, which is cardinal to public health and health protection.

Sir David Skegg: I would agree with the previous two speakers. Most of us thought that this was going to be beneficial in controlling the disease. Of course it is always very difficult to know exactly why politicians make a decision at a particular point in time. I am sure the Prime Minister knows, but there were a whole range of factors that determined why they progressively brought in border restrictions. Again, there was considerable public pressure to do this, it was not something that was unpopular. New Zealand, perhaps more than countries in Europe, relates more closely to countries like Hong Kong and Singapore. Repeatedly people talked about the SARS experience and that we needed to learn from the countries that had successfully dealt with diseases like SARS and MERS and so on.

Many of us felt uncomfortable about the border restrictions because they were recommended against by the World Health Organisation and generally we were trying to follow WHO advice. Interestingly, as Professor Leung said, although China was cutting off travel between certain provinces, they were very critical—and they were one of our main trading partners—when New Zealand brought in border restrictions against China. The Chinese officials in New Zealand were quite critical of that, but of

course later on they did the same thing themselves when their epidemic was under control.

Professor Wilsdon: Nothing to add on that.

Q766 **Chair:** The next thing that was clearly part of the scientific discussions here was a focus on the proportion of domestic infections that were caused by international travel. We have had many times quoted to us a figure of 0.5% being the assessment that was done on 23 March that Dehenna Davison referred to earlier, that was the figure for the proportion of domestic cases that would be accounted for by international arrivals. Repeatedly we have been told that is the most significant figure. The absolute number of new infections arriving from abroad was not a significant figure, only the proportion of domestic infections. Is that an approach that your countries have taken or would you be more inclined to also look at the absolute number of new infections arriving? Sir David Skegg.

Sir David Skegg: Yes, we would certainly be looking at the absolute number. By the way, the 0.5%, I do not know how that estimate was derived, but I am sure it is not necessarily a very precise one. I think at the time that those decisions were made in the UK, as I understand it, there was an acceptance that this virus was going to spread through the community. There was even talk about herd immunity and so on. It was a different context from New Zealand, where we had already decided to try to eliminate the infection. Again, it depends on the overall strategy and clearly that strategy has changed over time in the UK, but one needs to consider those decisions in the context of the game plan, as it were, at the time.

Professor Teo: I do not agree with the figure of 0.5% because I think it boils down to how one is quantifying that figure of importations leading to primary and second infections. Because if you do not have any contact tracing procedures in place what it means is if I enter the UK today and I am infected I could spread it on to perhaps five other contacts around me, and those five other contacts could go and spread on to other people, perhaps another five each, so that will be 25 or 30 people in total. Are all 30 people attributed to me or is it only the first initial five? I see that as very important in a country like Singapore, which essentially all our cases that we have right now are the result of importations, be it secondary, tertiary or subsequent chains of infection that happen. I see this to be absolutely crucial because when we start to think about figures like 0.5% it will grossly underestimate the impact of importation risk, because everyone that comes in we will perhaps see additional clusters. Each member within that cluster will go on and that is the dangerous nature of Covid-19 being so infectious.

First, I would hesitate to put much faith behind that figure of 0.5% without a very clear understanding of what it encompasses. Is it only the primary chain of infections or the secondary, tertiary and so on? Secondly, for a

country like the United Kingdom, again all the infections will be attributed to importations. I see that as an effect that when people come into a country with the disease and if we do not have a process to catch these people as quickly as possible, the border control measures become very crucial to limit importation risk. That is why throughout this discussion we have been talking about border control measures cannot be the only measure that is put in place, but it has to be accompanied with very comprehensive public health measures, including contact tracing, including aggressive testing, including social distancing and other forms of personal risk reduction.

Back to your first question, Chair, 0.5%, I think we have to be very cautious in putting much faith in that figure when, in an island country like the UK, essentially all your cases will be seeded from importations.

Professor Leung: First, let me just say that I disagree with using the proportion of cases that are attributed to importation as being the most important parameter to assess the threat to the local outbreak. The reason is this: when you try to build a model of spread, and there have been many builds in the UK as well as elsewhere, one of the most important things that we do is to look at how we seed that model. It is the absolute number of seeds that matter, it is not the proportion. That is number one because the proportion would of course give you very different absolute numbers, depending on what your denominator is. Your denominator in turn depends on how extensive and exhaustive your testing regime had been at the very beginning, not now.

Third, if you look at the Hong Kong experience, we have just finished a review of our first wave, which is by and large over, and 47% of our transmission chains—that is primary, secondary and tertiary cases—were seeded by imported cases, whereas the other half were seeded by so-called unlinked local cases. But of course Hong Kong was not the original epicentre, so these so-called unlinked local cases would all have been initiated by what we had missed as imported index cases.

Finally, let me just say again that what you observe, whether it is 0.5% in the case of the UK, as quoted, or elsewhere, as imported cases not only depend on testing but also depend on presentation of confirmed infected cases. The genomic epidemiology study I pointed to just a moment ago, if you then compare that study finding, which is much deeper in terms of looking at the origins of the different strains, you will probably get a very different picture to that 0.5% number quoted.

Chair: Professor Wilsdon, do you have anything to add on the science?

Professor Wilsdon: No, no more.

Q767 **Chair:** The other thing that they seem to have also concluded, and again I am interested in the scientific basis behind that, is at around that mid to

late March period, about two weeks before the UK level peaked, they looked specifically at Italy, France and Spain and concluded that because those countries were at similar levels of infection or at similar stages, therefore it was not worth imposing restrictions because we were at a similar stage. Again, does that make sense as a scientific approach from your point of view? Even at a time where you had more cases in your country and there was another country with a similar proportion of cases, would that have made you more relaxed about having infections arriving from that country or would you have still thought the right thing to do was to have restrictions in place? Professor Leung.

Professor Leung: I am slightly more persuaded by this because of the parity in gradient I think is the argument being proposed. Again, I go back to my original point of what is the objective of imposing your border restrictions? If it is to try to keep the bug out, then there is very little reason to justify doing so if you have a flat gradient between origin and destination countries. But if the objective is to make sure that the resource capacity of your health system, and your public health system in particular, is not exceeded—that is your ICU beds, your negative pressure rooms, your availability of respirators and doctors and nurses looking after these patients, plus your testing and tracing regime, they can cope—then perhaps that would be the reason why you might wish to impose border restrictions.

Sir David Skegg: I have nothing to add. I do not agree with the rationale, but I feel reluctant to be critical in retrospect, particularly when it is not clear to me what the overall strategy was at that time.

Professor Teo: I will be a little bit more critical. We will not have that arrangement with countries even if we are at the same high level of spread within the country. It is very different if we are at a very low level, so comparatively if Singapore and another country are both at very low levels we will have reciprocal arrangements for travel. In my opinion, it does not make sense when both countries are at very high levels we say that, "Because we are equally there, we should not need to worry about further importations". The reality is that I see additional importations to always bring in unknown risk to the country while you are struggling to contain the outbreak with very aggressive contact tracing. To be compounded with additional influx of people that are unknown, that you may have very little handle in terms of contract tracing and very little legal right towards their movement and also asking for their history of contacts, that makes the situation within a region very difficult. I would stand by the view that trying to have a reciprocal arrangement of relaxing the border controls because both countries are just as bad, in my opinion that will not work.

Professor Wilsdon: Again, nothing to add.

Q768 **Chair:** The next question I wanted to ask about is just in terms of where we are going from here and the kinds of border restrictions. Just going back

to this issue about whether you can do testing as an alternative to quarantine arrangements: if you were just to have testing, a very strong testing regime, and until you had a test you had to be quarantined, until you had the results from the test you could be quarantined and if you were symptomatic you still had to be quarantined, but those who are not symptomatic or have a negative test would no longer have to be quarantined, because that is one alternative approach that is being put here. How do you think that compares to a full-on 14-day quarantine regime? Does it give you 50% of the benefit, 75% of the benefit, 100% of the benefit? Professor Teo.

Professor Teo: The reality is, based on what we know about the transmission dynamics right now, a negative test at the point of entry may not mean anything. It does not necessarily mean that the person is free from infection because it could just be in the initial phase of infection where PCR tests are not that sensitive to pick it up. I will repeat, a negative test at the point of entry does not necessarily mean the person is free from infection. That is why we would still come back to the safest principle, which is quarantine. I have to emphasise that there are two issues when we talk about quarantine. The first is where you quarantine the person. Quarantining at home: in Singapore we have learned the hard way that self-quarantine at home is not going to be very effective if the rest of the members of the family get to move about. Secondly, if you are going to quarantine people it must be followed by enforcement.

Sir David Skegg: I agree with what has just been said. It would not be an alternative to quarantine. In New Zealand, because we are so keen to protect our borders, in fact in future people, as well as being quarantined for 14 days, will be tested near the beginning of that period and also at the end.

Q769 **Chair:** That is not an alternative to quarantine, that is in addition to quarantine, is it?

Sir David Skegg: No, it is in addition. As has just been said, a negative test does not mean someone is not going to become infectious in the days ahead.

Q770 **Chair:** Professor Wilsdon, is there any other international consideration of this that you are aware of or international sharing of evidence on this?

Professor Wilsdon: No, I do not think there is a consensus position. New Zealand and Singapore are certainly representative of where many countries are at at the moment. As I say, we are only seeing even the prospect of deviation from that very slowly from a small number of countries.

Professor Leung: Of course if health protection were the only consideration then I would say we should keep our present regime, which is test, hold at the airport and then to quarantine if you are not infected

and then retest on day 12 and then release on day 14 from quarantine. But because we are going to be doing a lot of this for the coming year, I daresay, then can we withstand that kind of tension in my three-way tug of war between health protection, economic preservation and social consent? If the answer is negative to that question, then what is the next best thing you can do?

I think what you proposed, Chair, in terms of exploring possibilities of either shortening and then perhaps substituting part of that shortening of the quarantine period with testing and how, I think that is not something that we could pull out of the top of our head based on so-called expert opinion. That is something that can and should be formally assessed through mathematical models, that has real empirical parameter as input. This is something that is tractable and you could assess it through mathematical modelling.

Q771 **Chair:** You could assess the alternative impacts of quarantining versus testing, do you mean?

Professor Leung: Certainly in the last 72 hours there were two papers, one in science, one in nature, evaluating already different kinds of interventions and their impact and putting a number in terms of risk reduction of these various interventions. One is in Europe, which is from Imperial College, and the other is for a selection of countries around the world from UC Berkeley.

Q772 **Chair:** We may follow up with you to just make sure we have exactly those papers because they also sound very interesting.

My final question is on where that dilemma takes us to in terms of that relationship between the economics, the public health and social consent now. For Europe, as we are approaching the summer holiday season, there is obviously huge pressure not just in the UK but in a lot of other European countries to have the tourist industry functioning in some form this summer. If you were going to try to manage those trade-offs, what point do you think you need to get the infections down to or how long do you need to keep your quarantine approach in place before you move to either a testing or a green lanes or air bridges and so on approach? If you tried to implement those at the current UK level of infections, does that lead to a significant increase of a second wave? I am obviously asking you this from the perspective of your countries having taken a very different approach. Professor Leung.

Professor Leung: Two things. One is of course if you do not encourage or facilitate this mass market tourism then it would be safest. That is making a statement of the obvious. It is also very difficult to imagine that most of these tourists would be lying on private beaches, so what you can imagine is crowded beaches, but I cannot imagine anybody going on a holiday in any kind of destination where you go and enjoy the sun but do very good hand hygiene and put on a mask. That is just not something that you could

imagine. I cannot imagine people sitting around a pool putting on a mask. That is very difficult to do.

That said, I think that we need to recognise that after the first wave, and a lot of countries in the northern hemisphere are either past the first wave or coming out of the first wave at the moment, including in the UK, you already have the most exposed and must vulnerable people infected. Most have recovered and therefore they have some protection. By extension, their immediate contacts around them, their usual contacts around them, may also have some indirect protection.

Second, remember that for any kind of newly emergent pathogen seasonality usually plays very little role, simply because everybody, as of January this year—everybody around the world—was susceptible. But as you go through the first wave and come out of the first wave you are now hitting summer season, which for directly transmissible respiratory pathogens like flu or like coronaviruses it is the so-called low season because of humidity and temperature usually. Seasonality may be on the side of less efficient transmission. I am not sure that it is going to be an absolutely dire situation if such mass market tourism activities were to go ahead but I would not recommend it.

Sir David Skegg: Sadly, I would not recommend it either. I can understand why people want to go on holiday. I was in Portugal myself last year and there were a lot of British people in the Algarve, so I am sure they are keen to have people come as well. A lot of people wish 2020 had not happened, but the fact is this virus is still with us and this year is going to be different from other years. I cannot see mass tourism being a good option at the moment.

Professor Wilsdon: Nothing to add, other than listening to colleagues talking now, I am certainly not in a hurry to book a summer holiday.

Professor Teo: Nothing much to add beyond the fact I would not recommend it. Also if we look at some of the serology studies that have been published for UK, Spain, France, it is quite clear that the vast majority of the population is still susceptible to infection and so the risk of subsequent waves of infection is very real. I do see that mass market tourism, if uncontrolled, will lead to subsequent waves of infection in the UK and in other parts of Europe.

Q773 **Chair:** My final question, which is just a yes or no question, some people have said to us it is too late now for it to be worth the UK bringing any kinds of border restrictions. Do you think it is too late for it to be worth the UK bringing in any border restrictions, yes or no? Professor Wilsdon.

Professor Wilsdon: No.

Sir David Skegg: No.

Professor Teo: No.

Professor Leung: No.

Chair: Thank you very much for your evidence. It has been hugely welcome and extremely interesting. We really appreciate it and appreciate all of your time this morning, this afternoon, this evening, whatever time of day it is with you now. Thank you, we are very grateful.