HOUSE OF COMMONS

Health Committee

Oral evidence: Brexit – medicines, medical devices and substances of human origin, HC 392

Tuesday 19 December 2017

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Watch the meeting

Members present: Dr Sarah Wollaston (Chair); Rt hon. Mr Ben Bradshaw; Rosie Cooper; Dr Caroline Johnson; Diana Johnson; Johnny Mercer; Andrew Selous; Dr Paul Williams.

Questions 219 -335

Witnesses

I: Professor Alan Boyd, President of Faculty of Pharmaceutical Medicine, Academy of Medical Royal Colleges; Emma Greenwood, Director of Policy, Cancer Research UK; John Maingay, Director of Policy and Public Affairs, British Heart Foundation; and Sir Hugh Taylor, Co-Chair, Brexit Health Alliance.

II: Hugo Fry, UK General Manager, Sanofi; Warwick Smith, Director General, British Generic Manufacturers Association; Phil Thomson, President, Global Affairs, GlaxoSmithKline; and John Wilkinson, Partner, Cooley LLP.

Written evidence from witnesses:

- Professor Alan Boyd
- Emma Greenwood
- John Maingay
- Sir Hugh Taylor
- Hugo Fry
- Warwick Smith

Examination of witnesses

Witnesses: Professor Alan Boyd, Emma Greenwood, John Maingay and Sir Hugh Taylor.

Q219 **Chair:** Welcome to the Health Committee and the third session of our inquiry into the effect of Brexit on medicines, devices and substances of human origin. I am very grateful to our panel. Could we start with you introducing yourselves and whom you are representing to those following from outside the room, starting with you, Sir Hugh?

Sir Hugh Taylor: I am Hugh Taylor. Today I am representing the Brexit Health Alliance, which brings together an alliance of NHS, medical, research, industry, patients and public health organisations. I think everybody else on the panel, one way or another, has a route into the Brexit Health Alliance.

John Maingay: I am John Maingay, representing the British Heart Foundation as director of policy and public affairs.

Emma Greenwood: I am Emma Greenwood, representing Cancer Research UK. I am the director of policy there and, obviously, we are a large funder of medical research.

Professor Boyd: I am Alan Boyd, president of the faculty of pharmaceutical medicine. In that role I sit on the council of the Academy of Medical Royal Colleges. The academy brings together all the 24 Medical Royal Colleges and faculties, and its remit is to drive improvement for health and patient care through education and training of doctors.

Chair: Thank you for that final point. I should emphasise that there is another Committee hearing about the effect of Brexit on medicines, devices and substances of human origin. That is the BEIS Committee, and their focus is going to be on the effect on the life sciences industry. This Committee's focus is primarily the effect on patients. Starting today is Diana.

Q220 **Diana Johnson:** Good afternoon. I would like to talk to you about funding. If the UK cannot continue to access European research funds and collaboration, what would this mean for investment? Starting with the pharmaceutical industry in particular, what would that mean for the next few years and beyond?

Professor Boyd: Shall I start with that one? It is not possible these days—in fact it has not been for a long time—to develop a new medicine in one country at all. It is a global industry and you need to run your clinical trials everywhere. Patients in the UK can currently access EU-wide clinical trials for a new treatment, particularly for rare diseases and children. That is very important. If the UK does exit and is not able to get access to the clinical trials network across Europe, it will certainly have an impact on the high-quality research in which we get involved.

Also, by participating in clinical studies, from the clinician's point of view, they get to know and experience the use of medicines under development, so that when those medicines are approved they know some of the advantages and disadvantages of those medicines. Of course, if they do not partake in those, they are going to miss out and will only know about those medicines when they are approved.

Perhaps I can give you two examples that will be of use. Most of the drugs currently under development—about 70% or 80% of them—are biologically based. They are antibodies, cell and gene therapies, and they are peptides. For most of those, a lot of the work is initiated in the UK, so we really are a leader in many of these areas. Antibodies and DNA were discovered here. This is where it happened. But we cannot just do the clinical trials here in the UK. We have to go elsewhere because of the patient; particularly with rare diseases we have to go outside. It is important that we have that network and that funding to keep those clinical trials moving to bring that together.

The other area is paediatrics. It may surprise you, but in neonatal medicine only one approved medicine is used in neonatal units, and that is surfactant. Everything else for neonates is used off label. Until the European regulations came in just over 10 years ago about paediatrics development, most of the medicines used in children were also off label, but over the last 10 years, with the paediatric infrastructure, the clinical trial network and the way that the drugs are regulated across Europe, as an industry we have really been able to advance paediatrics. Of course, coming outside the EU, we may not be able to participate in those clinical trial networks that have been set up across Europe. That, I think, is the big problem and the patients are going to suffer in the end.

Q221 **Diana Johnson:** You have gone on to answer my second question about the effect on patients, but, as to the pharmaceutical industry, are you saying that, because we would not be able to participate in EU-funded research, they would choose not to invest in this country? What do you think will happen?

Professor Boyd: There is that potential, because we are not the largest market in terms of sales, and I am sure other people have told you that. If we cannot make sure we are running clinical trials here to the same extent and then getting the drugs approved and used here, clearly we will slip down the list of where companies want to do their work. We are going to have to do something if we cannot collaborate in building up our clinical trial structure here and really put some emphasis behind that, and use the NHS.

Q222 **Diana Johnson:** I am sure Sir Hugh would want to comment on this.

Sir Hugh Taylor: Those points are all very well made. I would only add that we are a net beneficiary at the moment from the European funding on research, but, of course, we make a contribution. If we left the EU and we had no access in future to funds, or were making no contribution to

some newly developed common fund, there is the potential for the Government to match EU funding. But the point that Professor Boyd is making, and one with which I would agree, is that it is not just a question of funding, but of using that funding to access trials and so on. That is where some of the concerns that we have at the moment lie and why I think our members anyway put such strong emphasis on trying to reach an agreement with the EU in a post-Brexit situation on continued research funding and collaboration.

Q223 **Diana Johnson:** That is the ideal scenario for you.

Sir Hugh Taylor: That is what the Brexit Health Alliance has proposed, yes.

Q224 **Diana Johnson:** Does anyone else want to comment on that?

Emma Greenwood: I would maybe add to those remarks. Cancer Research UK exists to try to improve patient outcomes, so we want to have an NHS that is able to continue to improve and deliver better, kinder and innovative treatments. We put our money behind doing research in order to drive those improvements in care. Patients and the benefit for patients is absolutely at the heart of it.

For us, the questions around the future arrangement and our ability to continue to do research absolutely look at the priority we place on the results of that research being able to reach patients, which is where access to perhaps new drugs and the licensing regime that we are going to need to sort out as a result of exiting the EU come into play; and, equally, it is absolutely about continuing to run the sorts of studies that generate the evidence we need to continue to drive improvements and offer patients the opportunity to be in those studies. For many cancer patients, taking part in a clinical trial might offer a treatment route that would not otherwise be open to them; perhaps if they have tried a number of other things, that is a genuinely important option for them. For both those reasons, we need to be able to continue to do that.

As a funder that funds through a variety of routes but is also part of a wider funding infrastructure, both in the UK and globally, we are concerned that we may no longer benefit from the specific funding schemes currently run by the EU to which the UK contributes, but we would not put that at the top of our worry list. For us, especially when thinking about clinical trials, it is going to be much more important that we secure clarity on the future regulatory arrangement, because, quite frankly, if we don't sort that out it won't really matter whether we have money flowing or not. Fundamentally, if we can't take part in those pan-EU studies, that is going to be a problem.

The other thing that is high on our priorities—which, again, would be a deal breaker almost regardless of where the money is coming from, and maybe the UK Government could up the ante if some of the EU funding streams are closed down to us—is the flow of people and talent. Science

is a global enterprise. For scientific endeavour to flourish, it is about people consistently moving to and from different countries. For us, those would take more of a priority at this stage than concerns over individual EU funding schemes.

Q225 **Diana Johnson:** Thank you. Would you like to comment as well, John?

John Maingay: Only very briefly. The British Heart Foundation has not sponsored an actual clinical trial for a while, so I am not best placed here to speak on that, but, generally on funding, the ideal scenario is continued access to Horizon 2020 and what comes after Horizon 2020. However, it is important to recognise that it is not just about the money and access to it. It is about the collaborative opportunities that the funding streams create. It brings together researchers from all over the EU—it brings that talent together—and that is what is really at risk if we are talking about losing access to those funding streams. It is a loss of collaboration, because that strength of collaboration is really what drives excellence in the sector across Europe.

Q226 **Dr Williams:** You used the phrase "deal breaker" when you were talking about the flow of talent and the flow of people. Do I interpret from that that, if those people were not able to come to the UK, Cancer Research UK might still need to make those investments in those people in other countries to secure the best deal for UK patients?

Emma Greenwood: The way we think about this as a funder, almost regardless of the situation with Brexit negotiations, is that we want to fund the very best science. We will look for excellence, and, depending on where people are in the world, we will seek to fund the very best. But we are predominantly a UK funder of science. We know the UK infrastructure; we collaborate heavily with universities and with the NHS to optimise the UK infrastructure, so that, especially in the case of clinical studies, UK patients can directly benefit from taking part in those.

Our priority is to make sure that we can continue to attract the very best talent—not just the high-level talent but all types of the scientific workforce—into this country, and not just from the EU. There is a bigger question about the international field, but we are already open—and we will continue to be open—to funding talent that happens to not be based in the UK as part of a team approach.

We have something called Grand Challenge multimillion pound funding awards, where we are already open to funding people who are not necessarily based in the UK, albeit as part of a team—a collaborative approach—where there is some UK-based science. That is an interesting area that everybody is going to have to think differently about as a result of where we are headed with Brexit negotiations. We are really trying to emphasise with our work around research and mobility that this is an opportunity to think not just about EU nationals and securing a really positive outcome for those people, but making sure that UK nationals can continue to travel to other countries to collaborate on science, and that,

globally, we are more open and able to see that flow of talent. It is a pretty unique type of flow as well. It is not always the case that it is about people being able to come here and stay for long periods of time. Science moves around quite a lot. We are asking for that fluidity in the system that means we can do that across the board.

Q227 **Chair:** Thank you. That is a very important point that we will be raising with the Secretary of State when he comes before us.

Another issue, of course, is that the EU clinical trials regulation comes into force after we have left the European Union, and the Government have already said that they are going to seek to align closely with that. Could you say something perhaps, Sir Hugh, about what discussions you have had with European research counterparts as to how flexible you feel they will be in collaborating with researchers over here and sharing IT infrastructure and so forth, even if politically it is difficult for us to find an agreement? Do you think the scientists will carry on in spite of the politicians, in other words?

Sir Hugh Taylor: They may not be able to.

Chair: That is the point I want to explore with you.

Sir Hugh Taylor: In principle, there is a lot of good will on both sides. In the evidence that we sent in to the Committee, we quoted from a Frenchman—who was a former head of the WTO—who ran a high-level group on behalf of the European Commission, who expressed a strong commitment to the mutual benefits that the EU and the UK have had from collaboration on research. He said words to the effect that, whatever modalities occur as a result of Brexit on other areas, it would be very beneficial for both sides to continue to have collaboration on funding, networks and inputs to research generally post Brexit.

On behalf of the Brexit Health Alliance, which is supported by the NHS Confederation, the European office of the NHS Confederation has put quite a lot of effort into briefing decision makers across the European Union on the asks that we have been making in this country and impressing on those decision makers the mutual benefits that we have at the moment across the EU and the UK, both from research and indeed from alignment on regulation.

One senses a good deal of commitment to continued co-operation. That reflects, in part, the very substantial role that the UK has played in helping to develop systems of patient safety, public health and research collaboration across Europe over the past number of years. That is not a question of being arrogant; it is just a statement of fact. I must say, going back a long way now, that my experience, when I was in the Department of Health, of working with colleagues across Europe was that this was one of those areas where the contribution of this country has been held in very great respect. In global terms, both for our patients and our economic interests, it would be a real loss to lose that sense of collaboration.

Q228 **Chair:** So, everyone recognises that it is in both sides' best interests for this to continue and there is huge good will, as you say. Are you getting a sense from your European colleagues about what would be the things that would stop us sharing, for example, IT databases, in order for that collaboration on research to continue?

Sir Hugh Taylor: I am sure there are points of detail and there are obvious points of concern relating to the movement of goods, for example, which are outside the sort of conventional health jurisdiction. Within health regulation itself, inevitably, as we move out of the EU, there will be a trade-off between the level of independence with which we want to operate and the degree of full alignment. That is a position we will have to work through.

Q229 **Chair:** I am talking specifically about clinical research here. We are going to come on later to supply chains and so forth, which are obviously very complex. But just looking at research and research collaboration, because there is a sort of IT infrastructure that, increasingly, will support that for registration of patients and so forth, are you getting a sense from your colleagues across the EU that somebody would prevent us doing that?

Sir Hugh Taylor: I think that will depend on our willingness to continue to align fully with current and developing EU rules and regulations in that area. I am scratching the depth of my expertise on this already, but my recollection is that the UK has already made quite a significant contribution, for example, on issues of data protection, ensuring that wider EU rules and regulations on data protection do not impact adversely on health research collaboration. For the future, the issue will be our continuing willingness to align with the direction in which European Union rules and regulations would apply to us in those circumstances.

Chair: I know both Alan and Emma would like to come in.

Professor Boyd: In relation to the clinical trials issues, can I give you a real-life example? I talked about advanced therapies and cell and gene therapies. The way that they are developed and used is selecting individual centres of expertise that could develop these medicines and run the clinical trials. Because they are not being set up in every hospital in each of the countries, in these expert centres we are bringing in patients from other countries to participate in those clinical trials. To do that, we need a clinical trial application.

If the centre is here in London, we need a clinical trial application approval from the MHRA, and then when they get treated and go back to their country, depending on what happens to those patients and the sorts of investigations that are continued, they also need a clinical trial application in that country, which is all part of the European clinical trials network. If we break away and cannot do that, it is going to be quite difficult—it is probably not insurmountable—to move patients like that

across borders to take part in some of these key studies at which we are looking at the moment.

Emma Greenwood: For us certainly, this is at the heart of where we need to see a bit more clarity of thinking, both from the UK Government and the EU. I would completely endorse what Sir Hugh has said. There is so much willingness. We absolutely are seeing a lot of commitment around the direction of travel and the desire for the continued alignment and ability to be able to do these studies. Therefore, there is a sense of consensus on where we want to get to, but currently there is not the clarity that we need in how we get there.

Purely from a clinical trials perspective, a new regulation will be coming in. If we had not been exiting the EU, the MHRA would have been making sure that that was put in place in the UK, so that, for example, we could enter the studies that we wanted to do as part of a pan-EU approach into the data portal that is being set up as part of this new regulation. We simply do not know exactly what we need to put in place that would allow us to reach an agreement with the other member states so that we can continue to do that.

What we do in the UK has to be sufficient for them to agree that we can continue to co-operate under that legislative framework. It is down to the level of granularity. The way the regulation is currently drafted, to be able to input into that portal you have to be a member state. It is that sort of technical detail that we just do not quite know. Although there is significant willingness to get to the right end point, we have not yet seen the road map, from a legislative perspective, of what we have to do and also what it would take for the other member states in the EU to endorse that approach. That is where we need to get to.

Q230 **Chair:** That is a very important point. Technically, at the moment we would not be able to do it simply because we are excluded by the current wording.

Emma Greenwood: That is our understanding, exactly.

Chair: Thank you for clarifying that point.

Q231 **Dr Caroline Johnson:** I have a few small points to clarify. What proportion of medical research currently done in this country involves international collaboration within the EU, and what proportion is simply based on UK research?

Emma Greenwood: I can answer from a Cancer Research UK perspective because we know those numbers. For our clinical study—so, anything that would essentially fall under this regulation that we have been discussing—around a quarter involve another EU member state. That is a significant number, and we mainly find it, at the moment at least, in paediatric oncology and rarer cancers. The move and the trend is probably that that could increase because we are seeing, increasingly, stratification of different cancers based on genomics. Essentially, the

fundamental reason why we have to take that approach, where we are partnering with other countries, is to power the study enough such that the data generates an answer that can tell us whether that innovation should be rolled out or not. It is simply down to the numbers of patients that we need to get involved and we just do not have enough of them in this country.

Q232 **Dr Caroline Johnson:** I should at this point declare my interest as a Member of the Royal College of Paediatrics, a consultant paediatrician and someone who has participated, not as a patient but as a doctor, in a number of clinical trials involving children and young people. It came as no surprise to me to hear that most neonatal medicines are not properly licensed but used off label.

That is certainly true, but it has also been my experience that the vast majority of the studies have involved UK children only. To what extent is this an issue for the rarer diseases but not for the vast majority of conditions affecting the vast majority of children? To some extent, given the fact that we take such a lead in these trials, that we have such expertise and experience within the country to which you have alluded, and the willingness of people on both sides to share this information—because it is as much in our interests as theirs—are we being overly negative about what is essentially sorting out a bit of regulation that everybody wants to work and is for a minority of trials anyway?

Professor Boyd: Perhaps we can turn this round the other way. I agree with you that in rare diseases, orphan diseases and paediatrics we can run clinical trials in this country on our own because of the numbers that are involved. We have a worldwide reputation for running phase I studies in human volunteers and also the early exploratory studies that go on in indications such as cancer and life-threatening diseases. We can run those. I cannot give you a number because I just do not have one, but as you move up in the other areas and the other therapeutic areas into the phase II and certainly the phase III studies, apart from obviously paediatrics and rare diseases, that is when we need to have collaboration outside the UK. I am sorry I cannot give you the numbers. We can get back to you with that.

Dr Caroline Johnson: Okay.

Q233 **Dr Williams:** When new medicines are discovered and launched on to the market, we all want UK patients to be able to access them as quickly as possible, but we know that in some European but not EU countries the patients get delayed access to those medicines, sometimes by six or 12 months. What can the UK Government do, if we leave the EU, to make sure that our patients get access to those medicines without delay?

Emma Greenwood: I am happy to offer a couple of views, but others may be better placed to answer. There is a fundamental baseline around licensing. The first step, before you can have any access really, with a couple of exceptions, is to get a licence. Most people working in the NHS

are not going to be comfortable offering patients access to something that does not have a licence. So, we need to ensure that we have an approach in this country that enables us to swiftly know whether we have something licensed for the market for the UK.

Pretty much everything after that point is much more in our gift as a country, and this is where work such as the accelerated access review comes in, which is why I think others may be better placed to speak to this. It is around our NICE process and how we can take different approaches to assess the cost-effectiveness of medicines. It is what approach we want to take on how quickly we make things available, given the data from trials that we have, what level of uncertainty we are comfortable with and our reimbursement mechanisms. I think there is a baseline that we need to get really clear and get agreement and resolution on swiftly, which is around licensing, and then there is a whole suite of things that are in active Government policy with the life sciences strategy at the moment that we could also seek to do, which, for UK patients, could really shift the dial.

Q234 **Dr Williams:** Just to understand the licensing, if we are outside the European Medicines Agency and we have a different licensing mechanism from other European countries, it may be that the drug companies will get the EMA licence first because this will give access to a much larger market and then come to us second. John?

John Maingay: Yes. That business will make rational decisions. The EMA represents 24% to 25% of the global market; the UK represents 3%. So, the simple answer to your question is to do everything we can to ensure continuity of the licensing system and to make sure that the UK stays within it as far as possible. That is the simplest answer. I think Sir Hugh is best placed to talk about the accelerated access review, particularly in the context of Brexit, but the simplest answer has to be to stay in the system as far as possible post Brexit but to negotiate a suitable third-country agreement that more or less maintains the status quo.

Q235 **Chair:** Certainly, Sir Hugh, it would be very helpful to hear from you on that.

Sir Hugh Taylor: There are two slightly separate issues here. One is the implications for licensing for market authorisation if we are not part of the EMA and how that gets dealt with in future. The pitch from the Brexit Health Alliance, and indeed the stated Government objective, is to remain as closely aligned to Europe on that as possible. There is evidence, as you have said, which you have probably all seen, which is that, if you are a third party in that process, on average you get delayed in getting market authorisation. That has been the experience of countries such as Switzerland. That is one set of issues.

There is then a separate set of issues. Once you have that market or licensing process, how quickly in practice do patients get access to medicines or new technologies, indeed? I looked at that set of issues in

the context of the accelerated access review. Again, there are two dimensions to that. One is whether it is possible, using forms of conditional licensing and others, during a trial period to give more patients access to products that are still either in a trial period or in an evaluation period post- authorisation and pre-NICE endorsement. Then there is the question of post-NICE endorsement—whether, in practice, the NHS picks up quickly enough on new products, which was one reason why I was asked to do the review.

The Government have responded pretty well to the proposal. They have broadly welcomed the recommendations of my review, so I have broadly welcomed their response. There is more we can still do on that, by the way, but that is about really using the NHS effectively to have champions of innovation, new technologies and new drugs, because, in comparison with some EU and other countries, in some cases we are still slow to pick up even on NICE-approved medicines or new technologies that become available. I can go into detail on that.

We need both strands. We need to be absolutely as nimble as we can in relation to market licensing and ensure that people are not effectively looking elsewhere and outside our system for market authorisation; and, secondly, it is about trying to speed up the process within the UK once approvals have been given.

Professor Boyd: Can I add to that? I have talked about the importance of clinical trials and getting clinicians involved in clinical research so that, when drugs do get approved, they are already familiar with them. We have to think about what we can do to make doing clinical trials in the UK more attractive to companies. One problem is that we have the NHS, but obviously the primary purpose of the NHS is to treat patients. Perhaps we need to think about how we can put facilities in place so that, within the NHS, with the 65 million people that we have, we do more clinical trials here.

We have the NIHR—the National Institute for Health Research—that has excellent frameworks, but we could do with more resources to enable clinical research to go on within the NHS so that we get the pull and the push. We are developing medicines here, we are doing clinical trials, industries will get involved, and then, hopefully, they will come here earlier to get the drugs approved.

Chair: Thank you. Caroline would like to ask something, but I know, Johnny, you probably wanted to ask a bit more about the accelerated access review, which follows on from that point.

Q236 **Dr Caroline Johnson:** I have a quick question first to put back to Sir Hugh. You described the delay for countries. You described a delay for Switzerland in receiving medicines on the basis that they are a small market—and they are small. Their population is 8.3 million, which is less than the population of London. Do you think it is a fair comparison to say that it is a very small market, which it is compared with us? What sort of

delay has been experienced by a similar western country, with the sort of experience and expertise that we have and our size of population, because Switzerland is a very small market compared with the UK?

Sir Hugh Taylor: I understand. It is an observation rather than anything else. I was looking at the analysis that was done by the Office of Health Economics of 40 of our partners. Its analysis looked at not just Switzerland but also Canada and Australia, I think.

Q237 **Dr Caroline Johnson:** Australia's population is 24.1 million, which is only about a third of ours, is it not, so they are still a much smaller market?

Sir Hugh Taylor: If we are in this position, then I am sure the Government will want to see what it can do to minimise any impacts arising from that position. I am not trying to offer a counsel of despair on this. It is just an observable fact that there is a risk associated with being a third country for these purposes. But, of course, given the track record of the MHRA in this country, which after all has had a huge input to the EMA process over the years, we would seek to come up with a streamlined response. It is just that the perspective of our members at the moment is that the balance of advantages lies with seeking what we feel could still be a mutually beneficial approach on the part of both the UK and the EU to having a fully aligned system going forward.

Q238 **Johnny Mercer:** I want to talk about the implementation of these things. You have answered this question to an extent already as to the amount of collaboration that goes into innovative medicines and technologies and bringing them on stream for people. You have talked about accelerated access. We have sat through a few of these sessions now and talked about the impact of Brexit on these things, but can you lay out some clear and basic positives that can come as a result of this direction of travel that the country is now taking?

Sir Hugh Taylor: You are asking me.

Johnny Mercer: Yes.

Sir Hugh Taylor: The UK has a strong science base and it has some of the best universities in the world. Actually, it has a health system that is respected across the world, and some of the institutions that support it, including the MHRA and NICE, are well regarded across the world. As a sovereign state, we start from a strong position in this area, and the Government have committed themselves to a life sciences strategy that endorses those strengths looking forward. On the assumption that we are going to be outside the EU, we should be looking to maximise our science base and our strengths in life sciences generally. I do not think we should be approaching this from the point of view of being a victim.

Q239 **Johnny Mercer:** What are those opportunities in really basic terms? What are those opportunities that now present themselves to this country?

Sir Hugh Taylor: If we take one or two concrete examples, in the area of genetics, cellular and regenerative medicines—Professor Boyd will know much more about this than me—my understanding is that we are very near the leading edge of science in those sorts of areas. In addition, the fact that we have the potential in the NHS and through the MHRA and others to do research, and do research well, means we should continue to be a place that attracts both pharmaceutical and technological companies to this country to want to invest here. All the potential for that is there, particularly if we continue to support a vibrant health economy. Those are all strengths that we should be working off.

Q240 **Johnny Mercer:** What I am trying to unpick is this, and I accept you have tried to answer the question a couple of times and that those are constants that we have now. What are we going to get as a result of Brexit that is good in this sector, that is going to help, around innovation, medicines and technologies, and getting this stuff to patients quicker? If I can come to you, Professor Boyd, what do you think?

Professor Boyd: Yes. I think I can give you some examples for that. At the moment, the sorts of medicines that Sir Hugh has referred to—gene therapies, cell therapies and all the oncology therapies—are all regulated at the European level. So, it is quite difficult, from a regulatory point of view, for us to go out on a limb at the moment and say we will approve this product early. Once outside the EU, one advantage could be that we do approve these cell and gene therapies earlier, and the oncology products earlier, even at the end of phase II, which is what the accelerated access collaboration has been looking at. So, we can come out and do that ourselves and get those drugs earlier to market.

In terms of our expertise in those areas, there have now been about 2,500 clinical studies on gene therapy. Two thirds of those studies are done in the States and the rest are done outside, but the UK leads the way. We have done many more clinical studies than any other country in Europe put together. That is the sort of advantage that we have that we could take. It is the same in oncology. We could do that and license drugs earlier on conditional approval for the UK only, and then follow up with further studies.

Q241 **Johnny Mercer:** Okay, so licensing a little earlier. Is there anything else? How are we going to make up this deficit in collaboration that goes into research and science? Does anyone have any thoughts about that—not really?

Emma Greenwood: The way I would frame this is that, in the opportunity that now presents itself. I do not think there is anything particularly new or unique. We all know we have a fantastic NHS, and that if we did a number of things, both from a funding infrastructure and regulatory governance perspective in this country, we could unlock the potential of that. I feel that we are at a point now where we have an industrial strategy; we have this blueprint from Sir John Bell in terms of life sciences; there are some key areas where we could do stuff that no

one else is doing. Earlier detection of disease is another area, because we have a cohort in the NHS and data that we could unlock. It feels like there is a movement behind that that is more galvanised than it has been, because we know we are going to need to be a really attractive offer to industry so that they want to use the UK as their lab and they want to come to the UK above and beyond any other potential country. That is what I think is exciting and it feels as if there is a bit of a head of steam behind some of these things that, as you have said, perhaps have always been there, but now it feels as if there is a real drive to push and make that happen.

Sir Hugh Taylor: The reason we are hesitating is because I do not think there are prizes in this area at all for people who are resisting collaboration. All we are really saying is: why would we not want to collaborate with the EU going forward, particularly since they seem to want to collaborate with us on research?

Q242 **Johnny Mercer:** Are you confident that there are people in Government thinking about that at the moment?

Sir Hugh Taylor: I am confident. So far, the engagement we have had with Government has been wholly positive on this. The Secretaries of State for Health and BEIS—I cannot remember what it stands for these days, but it used to be the DTI in my day—

Chair: It is Business, Energy & Industrial Strategy.

Sir Hugh Taylor: They have come out with very positive statements about both research and regulatory alignment. I have been impressed with the grip that Ministers and colleagues in both the Departments and at the top of the NHS have on the risks and potential benefits in this area. In this whole complex of issues around Brexit, the key is to make sure that these issues are not overcrowded or compromised by other Brexit issues, because the potential for win-win is genuinely there. That is really what the Brexit Health Alliance is saying.

Q243 **Chair:** Can I pick up on a point that Emma raised about data sharing, because you will all be familiar with the debacle over care.data? How important do you feel it is that we revisit that area of sharing data for research in order to reap some of the benefits that we have talked about? Who wants to lead on that point?

Emma Greenwood: I am happy to pick it up. I think it is very important. Indeed, there is a lot of work under way at the Department to seek to have a new, fresh conversation with the public—with patients—about their data and how it is used. It is really important that that conversation happens and that it is a continued conversation. What perhaps we have learned is that just doing a comms push when you are launching a new initiative, such as care.data, is unhelpful. We need to get to a point where it is at the core and heart of how the NHS is working, and it is a known thing that data powers our services. So, the reason why

we are focusing on earlier diagnosis of cancer is because we have an understanding from the richness of the data that we are collecting at an anonymised level. We know what is happening and where the challenges in the pathway are. I do not think that is a known thing to most patients—the general public.

Q244 **Chair:** This is stressing more the benefits for patients for this—why it matters to them as well as putting in place the safeguards. You would like to see that conversation happening.

Emma Greenwood: Absolutely.

Q245 **Chair:** I do not know whether Alan, Hugh or John want to add to that.

Sir Hugh Taylor: I tried to make a strong feature in the accelerated access review—but it was a little watered down—of the importance of patient engagement and patient involvement in taking this agenda forward. Certainly, my experience at the trust of which I am the chair and in our co-operations with our academic partners demonstrate that patients want to be engaged in clinical trials. They value being offered the opportunity to do so, and this is overwhelmingly about putting the boot on the other foot so that patients have ownership of their own record, increasingly, going forward and make more determinations about them. This is an area where, to be honest, the work of the charities has been terrific. If we could get the whole system working as proactively in seeking to engage patients and their families on the importance of data sharing for the purposes of research, we would go a long way.

Professor Boyd: One of my main concerns around all this is patient safety and the safety database at the European level. Every serious adverse event that occurs in Europe that is reported ends up on the EudraVigilance safety database, which has a denominator of about 450 million people. It allows us to look for rare adverse events as drugs are being followed, particularly post-marketing, and to carry out pharmacoepidemiology studies around safety. When we are out of that, there is no guarantee we will have access to that database, and we may be back to where we were before the EMA came in, with our population of 60 million as the denominator—and we will miss things. It is a patient safety issue, I think, too around this.

John Maingay: Obviously for our researchers, particularly in congenital heart disease research, they need really big data sets. To give you an example of that, one of our funded research groups has been sequencing the genomes of 2,000 patients with congenital heart disease. They have been very successful in identifying a gene defect, but they needed to go abroad to do that. They did not have the numbers of willing patients in this country. They had to go to Germany and, I think, Japan—that far afield—in order to get a big enough data set to do that work.

I am sorry to jump around, but if I could come back to Johnny's question, I have some figures about collaborations. Where collaborations are

happening for our BHF-funded researchers, the majority are in the rest of Europe—that is, 385 out of 852—and behind that is the US with 221. You would expect US collaborations to lag behind a bit because of free movement. To answer Johnny's question about how we address that gap, it is through a simpler and fairer immigration system post Brexit that will apply to all these researchers across the world that helps us retain and attract the highest-quality researchers. It really does come down to what sort of immigration system is going to apply to future researchers wherever they are from.

Chair: Thank you very much. Caroline has a quick follow-up and then we are on to another area of divergence.

Q246 **Dr Caroline Johnson:** I want to mention the Horizon 2020 project because someone at the beginning mentioned its importance. We have talked about the importance of collaboration, and you just mentioned a study that involves Japan and Germany, which obviously is one EU and one non-EU country.

The Horizon 2020 programme has members of the EU, but it also has Iceland, Norway, Switzerland, Turkey and Israel as affiliated associated countries that participate on exactly the same terms. Do you think that offers the sort of relationship that we could have, allowing us, essentially, to have the best of both worlds: the opportunity to register drugs earlier, as Alan has suggested, but also to collaborate in the same way on the same project as we do now in Horizon 2020?

John Maingay: I think it does, but it is not ideal, because essentially you are replicating the benefits that we have currently in the EU but without the control. I do not exactly know how Iceland, Norway and Switzerland participate in Horizon 2020, but I imagine they still have to pay in a similar amount.

Q247 **Dr Caroline Johnson:** We are quite a big funder of this. As a percentage income, we put a lot in, and power often follows money.

John Maingay: The point is that we may lose control over the rule setting and regulations around the use of that funding. It is certainly a possibility, but I think—

Q248 **Dr Caroline Johnson:** But not a certainty.

John Maingay: It is not a certainty, and, compared with the status quo, we would still have access to the funding but would probably have less control over how that funding is distributed.

Professor Boyd: Also, I do not know if those countries you mentioned can select and, shall we say, steer and recommend what areas of research Horizon 2020 goes into. I do not know at that level really.

Q249 **Dr Caroline Johnson:** The Horizon 2020 website says they participate under the same conditions and same terms and legal entities as the member states, so it implies that they do the same.

Professor Boyd: Yes, and that would be important because, again, we need to steer things that are of interest.

Sir Hugh Taylor: That was the implication of the European Commission-inspired high-level study group, which said that the UK has one of the strongest science bases of all European countries and that a positive co-operation model based on mutual investment should be established so that the UK remains part of the European research area. On the research side, to be honest, the tension on whether we take advantage of being out of some of the regulatory dimensions will be the tension between full engagement of MHRA and others—full participation really—in the decision-making process going forward, if that is on the cards, versus a little bit of independence as well. There is a sort of "cake and eat it" argument going on there, which will need to be negotiated over the next period of time. One of the keys on that is to have a secure position during a transition period for preference, which will also give a little more time to work out some of the more complex underwriting details around governance going forward.

Q250 **Rosie Cooper:** I would like to ask a brief question on international influence and what you think the benefit for UK patients has been in being able to influence the EU and global standards. What are the real positives for our involvement in the EU medicines market and healthcare?

Professor Boyd: First, one of the most important has been our influence in the EMA. When the EMA was founded, from the UK we put a lot of work in there to help them develop, and we still make a significant contribution.

At the international level, one important organisation, certainly for medicines regulation, is the International Conference on Harmonisation, which is where all the regulatory authorities come together, initially led by the USA, Europe and Japan, that set the general guidelines in relation to the standards for manufacturing, safety and efficacy assessments of medicines. They now issue the ICH guidelines that are translated into national and federal laws. The US and Europe all follow ICH. It is the standards such as good manufacturing procedures, good laboratory practice and good clinical practice for running clinical practice. At the moment, the UK is part of that European, shall we say, delegation that attends. It will be very important, once we are outside that, that the UK gets a seat at that table because that is what controls medicines regulation on a global basis. Again, it is something that has not been talked of very much, but it is a very important group and is an example of our international influence.

Q251 **Rosie Cooper:** How difficult or not do you think that would be if you have America and Japan and other nations around the table?

Professor Boyd: I would like to think it would be fairly easy, given our reputation and contribution, but, clearly, we will have to negotiate that one as well, won't we?

Emma Greenwood: Just to add, this is something we specifically looked at earlier this year. We published a report that looked at the benefits from the UK having played a role in EU research and, indeed, global research. One of the strongest themes that came back to us from all the people that we spoke to and interviewed was how much value they placed on UK expertise being round the table when guidelines were being developed, even down to when the clinical trials directive was being revised into what is now the clinical trials regulation. That is just the scientific expertise, the knowledge we bring of systems and how to do research, even down to the concept of a randomised control trial as being a scientific standard of excellence. Again, there is such a willingness for that to continue. The scientific community does not think about borders in the way that perhaps Governments obviously must, but you can already see a couple of blockers being put in place just because of the uncertainty at the moment. That is what we want to try to negate, to overcome and continually remind people that that excellence, knowledge and expertise that we can bring to bear as a nation can still continue to contribute to those conversations.

Q252 **Rosie Cooper:** What would those blocks be and are you trying to deal with them now?

Emma Greenwood: It is down to a really fundamental level of certain conversations around maybe regulations or a new structure for the next version of Horizon 2020. Because there is uncertainty about the role that the UK will play, we are already starting to see a shift in our positioning in those discussions. It is not that we are not still round the table—because we absolutely are, as we should be, because we have not yet exited—but, for whatever reason, there is a slight stepping back of involvement of the UK already in those areas where there is not yet clarity.

One point to emphasise strongly, appreciating that this is a really complex set of negotiations, is that research takes a long time, and pharma funders such as CR UK are planning and making decisions now about studies that will run for years. It is really difficult, when we do not have certainty, to be able to plan as effectively as we can. Anything that can be done to bring forward clarity, certainty, early agreements, or whatever it might be, will help, both from a planning, funding and business decisions perspective as well as our ability to do that softer engagement and influencing at the EU and international level.

Q253 **Rosie Cooper:** Thank you. Hugh, do you want to add anything?

Sir Hugh Taylor: No. These are all very good points.

Q254 **Andrew Selous:** We have heard several times this afternoon about the good will from the scientific community within Europe towards the United Kingdom because of our undoubted expertise in hard science and our track record within this area. To what extent is that good will from the European scientific community replicated within the European

Commission, who will be taking the decisions on this? I do not know if that is one for you perhaps, Sir Hugh, and whether you have come across that. I know you cannot speak for the Commission, but I do not know what your thoughts are or your impression is as to how this might work out in terms of Mr Barnier's team and the people who take the decisions on the European Union side of this.

Sir Hugh Taylor: The short answer is I do not know. All I can say is that, at an informal level, discussions with the NHS Confederation's colleagues have been generally positive, but it would be idle to pretend that this is in the top 30 of the EU Commission's worry list on Brexit. One of our concerns, partly because there is quite a lot of good will around this area, is that it does not either get crowded out or compromised by other issues. I cannot answer your questions straightforwardly about the attitude of the European Union Commission on this. I can only say that, going back some time and from talking to colleagues recently, in general, the UK's expertise and commitment to the health and science agenda has generally been welcomed and recognised in the Commission, but I do not know how that translates into their view of this in relation to the wider negotiations.

Q255 **Andrew Selous:** It is obviously early days, but it would be helpful to the Committee just to have an indication.

Sir Hugh Taylor: All I can say is that, so far, the soft indications are positive in this area. That is my impression of talking to colleagues, but that is a highly subjective view.

Professor Boyd: Can I answer? The official stance the European Medicines Agency is taking, from the letters it is writing out to companies and individuals, is that we are leaving the EU on 31 March 2019. It has already put companies on notice that they will not be able to supply medicines unless they make a move. If they are based here in the UK, they need to be moved to within the EU27.

In addition, there are qualified persons in pharmacovigilance. Every medicinal product has to have an individual to look after it from a safety perspective, and these people have to reside within Europe. At the moment, a third of the QPPVs, as they are called—the qualified persons in pharmacovigilance—reside in the UK. These people have already been informed that they will need to move, otherwise they cannot do that job. That is their official stance. I do not really know and cannot comment upon the soft stance and the soft use.

Q256 **Andrew Selous:** That is fair enough. In terms of regulatory divergence, if the Government are unwilling or unable to make sure that the UK stays compatible with EU regulations after Brexit, what is the impact going to be of that on patients, if there is regulatory divergence?

Professor Boyd: There is a potential to have, clearly, delays in getting approvals. We already have a clinical trial approval system in place, so that should carry on, but, as I have said, most of the drugs are regulated

at the European level. So, if we cannot negotiate some kind of agreement, we are going to have to set up our own system. It is interesting how that should be. Could we, for instance, say, mirror the European system and automatically accept whatever they approve? Some countries do that. Before the EMA, many countries across the world always used to take whatever the MHRA approved. They would automatically approve it in their countries. We could perhaps adopt a similar approach and, if we disagreed with those approvals, not get those drugs approved here in Europe. There is the possibility to automatically do that, or we could set up our own entire review system.

I have said that 20% of the work is done by the MHRA. Turning that around, we do not do 80% of the work. If we are going to carry on and be a fully-fledged regulatory authority, clearly, we would have to increase the resources as well, but it would be possible to set up those systems, although it would be costly and resource intensive.

Q257 **Andrew Selous:** In practical terms, in terms of legal agreements and so on, what would need to happen for continued regulatory harmonisation to have effect after the UK leaves the EU?

Professor Boyd: For the UK.

Andrew Selous: Yes.

Professor Boyd: Clearly, we would have to put our own, new regulations in place. I know we have the great repeal Bill coming along in which to do that, but hopefully we could use that to approve medicines in the same way. As I have said, most are approved. We do not have regulations here related to orphan drug designation, SME status for medicines or paediatric approval, because again that is all done, and we would have to bring those laws in and do that. There are quite a lot of implications.

Q258 **Andrew Selous:** Is there some sort of draft legislation within the industry that is being worked up that the UK would need to put on the statute book fairly fast to ensure continued regulatory harmonisation? You have mentioned two or three areas just now.

Professor Boyd: Obviously, there are talks about it, but I do not know what is being put in place, to be honest, and what we are preparing for at this stage.

Emma Greenwood: Because it will not fall within the Bill, clinical trials regulation is the obvious one, where we know we are going to have to do something. My understanding is that the MHRA is currently working under the assumption that we will essentially be aligned and therefore we will have to put in place legislation that essentially mirrors the CTR, but that will only happen if there is agreement from across the EU that they will endorse that approach and that we will then continue to be able to operate under that same framework.

Q259 **Andrew Selous:** When you say, "We need to do something," you have

already told us this afternoon that speed is of the essence because of the need for certainty and so on. It would be helpful to have an idea of what needed to be done to ensure that harmonisation.

Professor Boyd: It would need statutory instruments putting in place, would it not, of some kind, to put those laws and requirements in place?

Q260 **Andrew Selous:** Sir Hugh, is the Brexit Health Alliance writing to the Department of Health with a list of draft statutory instruments that would need to be done?

Sir Hugh Taylor: No is the short answer to that. We need to distinguish between the potential transition period here and a subsequent period. The Government's official position at the moment is that they are hoping to achieve continuity. This is a matter for Government to consider in legislative terms. Of course, the time period between now and March next year for legislation, and the whole legislative timetable, is very limited. Over the next few months, we will be in active discussions with the Government about any contingency plans that they think they need to put into place in the event that we exit the EU without any form of agreement whatsoever, but I think the working assumption at the moment is that we will have a transition plan in place for a period, with, potentially, a framework for a future remit going forward. That is the working assumption.

Q261 **Andrew Selous:** My line of thinking is that if the industry knew those contingency plans were in place and ready to go—the Government are obviously looking for continued alignment and have said that—that would provide a bit of certainty for the pharmaceutical companies if every option was covered off. That was my line of thought.

Emma Greenwood: In addition to that, there is a need to understand that whatever we are proposing would be acceptable to the EU, and that is maybe where some of the challenge is. As we have indicated, that is absolutely what the UK Government are saying that they are seeking to do, but, until there is a bit more detail on that, it is nearly impossible for the EU to say whether that would prove to be acceptable to them for an arrangement. If you are a business making decisions in the next six months, it is probably still not quite enough certainty on which to inform those decisions.

Andrew Selous: Understood.

Sir Hugh Taylor: I think what the Government have said on this is that, in the event that it is not possible to reach a deal that secures ongoing close collaboration between the UK and Europe, we will set up a regulatory system in the UK that protects the best interests of patients and supports industry to grow and flourish. That is the general statement, and some aspects of that will be covered by the current legislation going before Parliament because some laws will continue. But I think my former colleagues in the Department will be looking very hard

at a no-deal scenario, in which case I suspect some form of emergency legislation might need to come before the House.

Andrew Selous: We can quiz the Secretary of State on that very point when he comes before us.

Q262 **Chair:** My final point was going to be: are there any issues that you would want to hear the Committee explore with the Secretary of State when he comes before us? What would need to be there in emergency legislation is clearly one of them. Are there any other key areas?

Professor Boyd: The key area is, if we can, to try to negotiate a link. You have heard us all explain our concerns, and this comes down to patient safety. It is a public safety issue. I am not a politician, but perhaps we could rise above politics for patient safety. That is where I think we are.

Q263 **Chair:** Exploring the patient safety issues, making sure they are fully recognised and that there is a contingency plan in place would be your priority.

Professor Boyd: Yes.

Q264 **Chair:** Are there any other points that either Emma or John would like to add to that?

John Maingay: I would echo all that, but also to try not to leave it too late, because we need to be alive to the risk of this whole issue of our place in the licensing system being caught up in a flurry of horse trading after a trade deal is negotiated. I do not think it is going to serve the interests of patients too well if it becomes part of a last-minute horse-trading exercise.

Chair: Thank you. Thank you all for coming this afternoon.

Examination of witnesses

Witnesses: Hugo Fry, Warwick Smith, Phil Thomson and John Wilkinson.

Q265 **Chair:** Welcome to our second panel. As before, I stress that the focus of this inquiry is the impact on patients. You will be familiar with, and I am sure many of you have also given evidence to, the BEIS inquiry that is running simultaneously. I should also mention that we are expecting a vote round about 4 o'clock, so apologies in advance that we are likely to be interrupted. For those following from outside the room, could you introduce yourselves and whom you are representing, starting with you, John Wilkinson?

John Wilkinson: Certainly, thank you. I am John Wilkinson. I am a solicitor in a global law firm, Cooley LLP. Cooley started as a law firm in Palo Alto and has grown up through acting for life sciences companies, initially in the US and Silicon Valley but now globally. My practice consists mainly of acting for biotechnology companies rather than the big pharma

companies, at the development stage rather than the launched products. Prior to becoming a lawyer, I was a development chemist for AstraZeneca, which is a little bit of the other side of the industry.

I should say that the views I represent are my personal views and not the views of the firm. With 300 partners, it is difficult to corral them all to a single view, as in any organisation. While my views are informed by my clients, they do not represent the views of any of my clients, but I am very happy to contribute.

Phil Thomson: Good afternoon. I am Phil Thomson. I work for GSK. I am on the management team and have responsibility for Brexit, operations and contingency planning.

Hugo Fry: My name is Hugo Fry. I am the managing director of Sanofi in the UK and Ireland. I am delighted that this is focused on patients. We have significant research and development activity in the UK. We have two big manufacturing sites in Cheshire and Suffolk plus big commercial operations, and we employ about 1,800 people here. I am the chairman of the Brexit committee for global Sanofi.

Warwick Smith: I am Warwick Smith, director general of the British Generic Manufacturers Association, representing the manufacturers of off-patent medicines, both generics and biosimilars, which is roughly 75% of the NHS prescription medicines used in the UK.

Chair: Thank you. We are grateful to all of you for coming this afternoon. Johnny Mercer is going to start the questioning.

Q266 **Johnny Mercer:** Can I start with you, please, Phil? Talking about patients, people are talking at the moment about hard and soft Brexit, and all this sort of stuff. What are the implications of no deal at all for the UK coming out of the European Union? What impact would that have on your sales?

Phil Thomson: Thank you for asking the question, because I agree with Hugo that I think this Committee's work is very important in the sense of patient safety, and in a no-deal scenario we have some concerns. At the moment we have enacted our contingency planning, so we are already making changes and initiating that. We are working on the basis of the worst possible case, which is a disorderly exit in March 2019.

In that case, and even in a more planned case, because of Brexit, we know we need to put in extra testing facilities both sides of the channel. That is going to take some time. We believe that we are going to need six new labs to bring on stream. We are going to have to put capacity into 10 of our existing labs, which are based both in Europe and in the UK. That takes a minimum of 18 months.

Q267 **Johnny Mercer:** To give people an idea, when you talk about a lab, how many labs do you have in the UK at the moment?

Phil Thomson: In the UK, as regards relevant labs for this, at the moment we have three.

Q268 **Johnny Mercer:** You are looking at having six new ones on the continent.

Phil Thomson: No—two in the UK and four on the continent. Essentially, we have 16 labs currently operating in the UK and in Europe. We need to put six more on, but we also need to put capacity in 10 of our existing labs. The point I want to make to the Committee is that it takes time to do this. We can do it, but, as I am sure my colleague on my left is going to say, all of us in the industry are trying to do this and access the same people, the same parties, and therefore it is a lot of pressure going into the system. The important thing I would ask the Committee to think about here is that we think it takes about 18 months to do this. I know, having talked to other major companies, that they are in the same position as we are. It may even take three years just because of the complexity and the regulatory approvals that are needed.

My point to the Committee is that on these timelines—in answer to your question, in the worst-case scenario—we need to put in place measures that will allow us to do that. The key is obviously a transition period, which is why we are asking Government to consider this very strongly.

Secondly, we believe we need to prioritise patient safety in this first phase of negotiations in this second round. The previous panel talked about emergency legislation and the need to put in mutual recognition early enough, so that we do not have a disruption to supply. Obviously, on what I have just described to you, on those timelines we think that is really important.

Q269 **Johnny Mercer:** Hugo, would you basically echo that?

Hugo Fry: I echo that. I would add one aspect. We have two labs in each site, so it is all about products that currently are released. There is a qualified person who does quality control in those factories and releases them direct to the other EU27 countries. As the UK will become a third country, then the EU only recognises products released in the EU, in which we would not be any more, so that is the basic situation. We are taking the same decisions right now, and I echo the timelines that that takes 15 to 18 months.

Q270 **Johnny Mercer:** Do you think the pharma sector as a whole is pedalling as fast as it can in terms of trying to understand what the threats and challenges are, or is there more that the Government can do to help that process?

Hugo Fry: It is the speed of going forward. We are having to take a scenario of no deal or a disorderly Brexit. We have no other choice. If it is that, we think of the patients at the end. In fact, there is just one nuance I would put in there. The supply to the UK patients is within the UK's control. So, the Government, with the MHRA, could say, "We recognise

the release in any of the other 27 countries," and that is fine, and the products will come in. However, the EU27 will not necessarily recognise the release of that product, so there is a bigger question mark for the patients in the rest of Europe than there is in the UK, because I am assuming, potentially—although I am still planning for a no deal—that the Government will work with the MHRA to get to a good deal on that point.

Warwick Smith: First, I agree with all that, so I am not going to repeat it. I have two specific points. For the generic industry—and Professor Boyd covered this in his evidence—because a lot of our medicines are made in places like India, there has been a natural tendency to have that quality sign-off in the UK for cultural and linguistic reasons. That is why we have a significant number of qualified persons based in the UK, certainly for the generic industry. It would be disastrous to duplicate that role between the 27 and the UK. I know that the MHRA is looking at a way to duplicate-lite, if I can put it that way, which is a step forward, but having a form of mutual recognition. This only being done once would be the preferable solution.

Secondly—and, again, we heard evidence earlier around regulation, which is extremely important for all of us—for biosimilar medicines, so biologics once they have come off patent, there is only an EU regulatory pathway. There is no UK regulatory pathway. The European Commission was ahead of the rest of the world in developing that pathway. It is why we have more biosimilars in Europe than we do, for example, in the US, where they were late to come forward with a bespoke regulatory framework. If nothing is done and if we are not part of the EU, there is no way of bringing these medicines to the market in the UK, and Simon Stevens has said he looks to a saving of £300 million over the next five years from those medicines.

That also plays to access to patients. These are life-changing, life-saving medicines that take us into a new realm of treating more patients, once they have come off patent, for the same amount of money, and there is a real gap there for us. To my knowledge, there is, as yet, no plan to deal with that gap.

Q271 **Johnny Mercer:** John, would you add to any of that?

John Wilkinson: I concur with the views you have heard. Not being within big pharma, I cannot comment on the steps that the companies are taking, but it certainly all sounds correct.

Q272 **Dr Williams:** I am going to ask about research and development. I would like first to ask you what the ideal scenario would be in the longer term for the UK in relation to the EU's research and development activities, such as the IMI and Horizon 2020?

Hugo Fry: I can talk about the IMI. Sanofi has 62 projects today in the UK. We partner with academic institutions, universities and small start-ups. Of those, about 40% have some kind of funding with Horizon

2020 and the IMI. That is very important and should continue. The UK is the biggest contributor to those funds, and so it is a virtuous circle.

Let's be clear: good science does not go away overnight and the UK is a good place for science, so a lot of that will continue. The thing is how to build on it and continue, as a UK scientist myself once upon a time. The important thing is that you are right in saying that Turkey and Switzerland have a certain status within that. The thing to do is to push it. They are still funding at the moment, but we are seeing a slight drop-off. There are signs that the UK influence, even on sentiment, is waning, so it would be great to have some attention and some political pressure on that to keep it going because we do believe it is important. That is what I would call the "R" bit—the research bit.

On the development side, we invest over £45 million a year probably in late-stage clinical trials, and those are good. There might be a short-term drop because people are confused about what is replacing it in how to get them registered, but there is an opportunity to lighten the burden of administration there. It is heavy when you have 28 countries all approving clinical trials in this way and that way, and on top of that you have local ethics committees and things like that. So, there would be an opportunity to lighten the load. Any country that is good at science but also can rapidly enrol patients and get them through—and the UK, again, does good science—could up its investment, because companies like ours would look to countries like that and get a bigger allocation of patients in a global clinical development programme.

Phil Thomson: Johnny had a good phrase earlier, which was that the UK needs to compete globally. If you can make the UK the best laboratory in the world, that is what will create competitive advantage and will allow companies to invest. Simply making the UK the best laboratory in the world, I believe, is very good implementation of the life sciences industrial strategy.

I think John Bell's work is outstanding. We have been involved in it and are a very big supporter of it. It has all the necessary components to improve the dynamic of how the UK sits around life sciences, whether that is the R&D and academic base that was mentioned earlier on, through to delivery of medicines into the hands of patients, and everything that comes in between. Implementing that strategy well with industry and Government, and capitalising on the NHS, is really important.

Q273 **Dr Williams:** Can that happen even if we do not negotiate the best deal with the IMI and Horizon 2020?

Phil Thomson: I think it is an important element of it. Somebody on the previous panel mentioned that science has no boundaries. I think we all know that, and as a country we have to try to implement that strategy and capitalise on the strengths we have. We do have some opportunities here. The risk, though, is that, if we diverge too far away from Europe,

then there is a corresponding effect on how competitive you are in your own strategy.

We have to invest in the life sciences strategy, invest in the UK and capitalise on our strengths, but in the world of science and health I would make the argument that that cannot be done in isolation from the rest of the world. Therefore, we need the connection points in Europe such as IMI or access to that funding to be able to do it.

Q274 **Dr Williams:** Your company has made significant investments in the last six months—or announced significant investments—despite the uncertainty.

Phil Thomson: Yes, we have, and that is because, as I say, we fundamentally believe that the life sciences strategy is the right strategy. There is no doubt, as the panel previously said, that the UK has some excellent competitive advantages, some of which we know about—universities, some of the R&D work, and in fact many of the companies that exist here—and others that are there to be developed further. The NHS was mentioned earlier, but the NHS as a data source is potentially a huge competitive advantage relative to other countries' systems. If we can mobilise around that, which is a fundamental part of the strategy for life sciences, I believe we can be successful. But I also want to be honest with the Committee that there is a risk here in developing all of that in isolation, not just to Europe but to America. The Chinese are now investing very significantly in the way they are reforming their clinical trial structures, for example. We have to be global in our mindset, but Europe is an important part of that.

Q275 **Dr Williams:** Does anybody else want to comment on our relationship with the EU's R&D?

John Wilkinson: Yes, certainly. Speaking with experience of trying to negotiate Horizon 2020 agreements, they are horribly complicated, and the flexibility in them is limited. The implementation cost of Horizon 2020 in my experience is higher than is ideal. They do get people and companies collaborating with academia across Europe. The one I did most recently, which was only finalised this month, was an EEA country rather than a European company, collaborating with European Union academic institutions, including a UK academic institution. Another Swiss client of mine has been involved in Horizon 2020 agreements as well. So, membership of the European Union is not a bar, from the experience I get from my clients. I think the UK does need to focus on investment.

One aspect that is challenging around the world, but particularly in the UK, is what we think of as translational science. We have fabulous universities and fabulous pharma companies, but there is a gap between the two. Getting those products from the lab to the clinic is a challenge. One client that I have spoken to, and they are happy for me to mention, is a client called the CRT Pioneer Fund. That was originally set up as a joint fund between Cancer Research UK and the European Investment

Fund. Without that European investment money, that would not have happened. It was a £50 million-fund. They have in-licensed 12 programmes. They now have something like four or five things in the clinic from those programmes. Some were in already when they were licensed but some they have taken into the clinic. They have out-licensed two of those.

This is a very significant success that was driven from European investment. If we leave the European Union, we need to replicate that, not on a Horizon 2020-type basis, where it is a call for requests for grants, but something that is a little more free-flowing in the same way as the European Investment Fund to ensure that those difficult-to-fund bits of not science, not development, but the bit in between, can continue. For me, that is one of the cores that we need to try to make sure we keep.

Warwick Smith: My members do not focus on empirical research but more on incremental research, so we have been working with the Association of Medical Research Charities to see how we can repurpose older medicines for new uses and new indications. The R&D tax credits that were in the life sciences strategy are really important for that. The joint report is going to Ministers in January, which we hope will unlock a lock on making the best use of older medicines.

Q276 **Andrew Selous:** Staying with the life sciences sector deal, which we have been talking about a bit so far, it was launched earlier this month on 6 December. The Government talked about making the UK the world's most innovative economy in this area. To me, it does seem a very positively ambitious programme. Where would those Government aspirations be for this sector deal if the UK were to leave the EU without any sort of deal at all? What would happen to the strategy? What would be the impact on it in terms of its effect as far as the industry and patients were concerned?

Phil Thomson: In some respects, the strategy becomes even more important, because if there is a hard exit from the European Union without these points of connectivity, whether it is on regulatory, trade or supply, how the UK then develops itself to be competitive is very important. The life sciences strategy is absolutely designed to do that, going back to some of the comments I made earlier.

In the sense of a hard exit, the issue that I am most concerned with right now is that, in the absence of a transition period that will allow us to get the work done that needs to be done, there is a real risk of disruption of supplies. Hugo was right in what he said earlier, but I would add that we have HIV drugs that are manufactured here in primary manufacturing, but in secondary manufacturing they are sent to Poland and then brought back to the UK; I am sure you have heard about this before.

We have just worked with the UK Government to bring more meningitis vaccines here to the UK to protect babies from meningitis. The reality is

that they are all manufactured in Belgium, and therefore we need to be able to make sure that we can bring those vaccines into the country.

I am not trying to negate the importance of the life sciences strategy, but my strong message to the Committee would be that, even before then, we have some short-term issues that we need to address together around how we ensure supply to patients, and that is the biggest risk I immediately see, which I am most concerned about.

Chair: We are going to come back to that specifically later on.

Q277 **Andrew Selous:** As to the life sciences strategy, there are quite a few different parts to it. Which aspects of the strategy are most at risk from the Brexit process in terms of the different component parts of it?

Phil Thomson: You have already identified them, but in R&D it is around movement of people and scientists accessing the UK and vice versa, and therefore having the right immigration scheme to support that. The other area is where Dr Williams was going, which was around funding. This point around having enough capital either to invest in the UK or to enable investment out of the UK is really important.

We have mentioned European funding, investors such as Neil Woodford and the Patient Capital Trust, which is in the life sciences strategy. These are very important, and of course investment is not looked at just in UK terms. Pulling capital in requires global strategies.

Those are the two areas to which I would point. If you break from the European Union without a good enough arrangement going forward, risking on scientific movement, people and also on funding, then it starts to impact strategy.

Q278 **Andrew Selous:** That is helpful. Hopefully, you will be encouraged by what the Government have said about wanting to have a future immigration policy that does recognise the value that scientists in particular bring to this country.

Phil Thomson: Yes, and already we saw a measure in the strategy that talks about particularly enabling scientists to transfer between Europe and the UK. We have already seen good evidence of that kind of commitment, but we have 1,400 people here in the UK who are European citizens working for us. Yes, of course, some of them are scientists, but they are not all scientists, although they are equally important. There are good signs so far.

John Wilkinson: If I could add to that, in danger of slightly repeating it but giving some examples, when I was preparing I was thinking that there are three pillars to the life sciences industry, particularly from my perspective as the development part of the industry. Again, they are access to top-level science, access to world-class labour and access to capital. I will pick up a couple of points there. When we talk about access to capital, I think people like Neil Woodford are very important, but the

ability of the companies to grow in the UK and then license their technology out to companies outside the UK is a vital contributor.

To give you an example, a company based in Oxford called PsiOxus did a deal last year where the signature payment was $50 million. Last month they got a $15 million milestone, which was just the start. There is up to $866 million-worth of milestones just in that one agreement. Here we see a way of capital flowing into the UK, effectively the transition of science into economic value. That company on that development programme has people from 17 different countries working on it, eight from the European Union and nine from outside.

Reiterating something that was said earlier this afternoon, we talk about access to world-class science, not just access to European-class science and world-class people. Having an immigration system that allows people from all over the world to come, and to be attractive, will massively enhance our ability to be competitive in the life sciences sector. In preparation for this, I read Roche's submission and they mentioned that in the UK they have employees from 42 different countries. Even if they have one from every single member state of the European Union, they still have 15 other countries outside the European Union. We do need to remember, while we are focused on Brexit, that this is a global business, globally regulated, and that science is a global science.

Andrew Selous: That is very helpful, thank you.

Q279 **Diana Johnson:** I would like to ask about the legal framework for research and development, and how it needs to be adapted when we leave the EU to maintain competitiveness, but also to ensure that we can get the rapid availability of medicines. Perhaps as the lawyer on the panel, you could start with that. What do you think needs to happen?

John Wilkinson: I think you have heard a fair amount on the approval of medicines. Partly because it is not my area and I do transactions for companies—I act for development companies rather than going through the approvals—I think it is vital that we need to get that approval system right. Replicating, to the extent that it does not get incorporated into UK law, all the aspects of the approval system, including biosimilars and the like, is very important. At the development stage, I think a number of the pieces of the jigsaw are already there and we have a clinical trials framework.

When we talk about clinical trials, everybody is taking clinical trials as one thing. We have to remember that there are three phases of clinical trial: phase I, phase II and phase III.

A phase I clinical trial is a small study, generally on healthy volunteers, unless it takes place for cancer or some disease where it would not be ethical to do it on healthy people, but that tends to be in a single centre. The UK has a great opportunity to be competitive there by making it a much more streamlined system, because an awful lot of the clinical trials

directive and the clinical trials regulation is about streamlining the process for approval of clinical trials. As you heard from Professor Boyd, the good clinical practice guidelines come from the ICH, so the standard by which the quality of the clinical data is measured is very internationally harmonised, not just by the European Union but by the Japanese and the US.

A phase II clinical trial is looking at patients in a limited number of sites to get safety tolerability data and possibly some initial implications of efficacy. That is where I think we need to be very careful to be competitive, because it is where we are going to lose out if we are not integrated with Europe or at least an attractive destination.

For phase III clinical trials, you need lots of patients to get those right unless they are in the particular orphan indications. A lot of those trials—and my colleagues from the pharma industry here will correct me if I am wrong—cover not just the European Union and not just the US. They are global studies. The ones where I have worked on them included Russia, the US, Brazil, and, obviously, Europe as well, and Japanese sites. We have to think about them separately, because phase III clinical trials are being done despite the fact that there are different barriers to accessing the clinical trial network. For me, it is about making sure that we keep that framework competitive and interesting.

Q280 **Diana Johnson:** Anybody else?

Hugo Fry: I would reinforce the idea around phase III trials. I used to run clinical development programmes around the world, and we literally look at it and parcel out the patients around the world. They go to Russia, the US, South America, China and Australia, and so on. I will let John talk about the legal framework, but certainly it is the administrative burden, the ability to recruit and the quality of the data at the end that counts. The quality of data coming out of the UK is already great. If they can improve the ability to recruit, that would really improve things.

However, to come to your question, which is about getting access to the medicines and regulatory approval for the patients, I will touch on what was said in the earlier session, which is that even our company—and we are one of the biggest pharmaceutical companies in the world—does not have the capacity to simultaneously submit files to every regulatory board around the world. We cannot do the FDA, the EMA, Japan, Health Canada, Switzerland, Australia, and so on. There is a hierarchy that fits in.

Why? It is because we are interested in getting medicine and vaccines into patients. As to numbers of patients, the EMA is a lot bigger than Europe, so more patients will get the medicine from that point of view. Then you are back into the discussion around whether the MHRA is, in the negotiation, going to stay as aligned as possible to the EMA regulatory framework. That would be the quickest and easiest way to ensure that UK patients still got the medicine. It would get to the approval stage and

then go to the EC in Europe for rubber-stamping and then Westminster. You can even gain a month or two there if Westminster were first.

Q281 **Chair:** That is interesting. Did you want to add a point?

Warwick Smith: I was just going to reinforce that last point because it is critically important. For us, getting the regulation right, going forward, is the critical thing. Not having to repeat processes for the one that we have done for the 27 again is critically important. There are potential upsides here, where the MHRA in that final stage of the licensing process can move faster than 27. So, it is possible to construct a system that has product getting to the market in the UK a little faster, but only if we have shared that initial and—fundamentally—main process of regulation. If we do it separately and in a different way, it is very difficult to bring products to the market in the UK at the same time as the 27, for all the reasons Hugo has put.

Q282 **Chair:** You mentioned earlier, both Phil and Hugo, the amount of contingency planning you are already having to do for a possible no-deal scenario. Are you doing the same kind of contingency planning for there being no deal and getting arrangements set up in case you do have to use other mechanisms for approvals? You mentioned you are setting up labs for qualified persons.

Phil Thomson: Yes, we are, actually.

Q283 **Chair:** But is there other contingency planning in which you are investing? I am trying to get a sense of how much money you are having to invest at this stage in a possible no deal.

Phil Thomson: Let me try to answer that for you. Our current estimate is that we think we have 1,700 products directly affected, if I can call it that, by Brexit. In other words, they are either being manufactured in the UK or Europe, or they are going back and forth, and therefore we need to do a couple of things. One is to put in place a testing facility, as I mentioned earlier, and the new laboratory capacity. The second is transferring marketing authorisations. Products that have been approved in the UK, now unregistered in the UK, need to be re-authorised for Europe. We think there are about 1,200 of those that we will need to do. For each product, we need to get those re-authorised and put through the system.

Q284 **Chair:** Even though they are currently authorised, you will have to get them re-authorised.

Phil Thomson: I mean re-authorised in the sense of reregistered, not necessarily going back through the approvals process system. We need to work through that. Of the products affected, the impact of the testing changes and the reregistration is about 13,000 packs that will have to be updated as a result of what we need to do.

Q285 **Chair:** Each individual pack will have to be updated—gosh.

Phil Thomson: That is right, because if you change where it is registered, for example, you have to change the address of literally where the pack is. The reason why I am giving you these numbers is to give you a sense of the scale. Obviously, GSK has a significant portfolio and is very heavily invested in the UK, but I can imagine my good colleague here will have similar sorts of numbers, and I know AstraZeneca do. This is what I mean in terms of the pressure that will be going into the system to get these things done and accessed. I can tell you that our latest estimate is somewhere between £60 million and £70 million of cost for what we need to do.

Q286 **Chair:** That is £60 million to £70 million of cost in total just in contingency planning if there is a no deal.

Phil Thomson: Yes.

Q287 **Chair:** That is vast.

Phil Thomson: Over a period of three or four years, yes.

Q288 **Mr Bradshaw:** Excuse me, Chair. You will know before then whether it is a no-deal scenario, within three or four years, so you think—

Phil Thomson: Forgive me, I think you were out of the room when we talked about this, but the point I made earlier is that we have to move on some of this now because the timeline to implement the laboratories, at a minimum, takes 18 months; so, we are already having to initiate cost as a result of this.

Q289 **Chair:** Just to clarify, this is the total cost you are estimating should a no-deal scenario emerge. If that does not happen, common sense prevails and we reach a sensible mutual agreement, how much do you think you will have invested just putting these contingencies in place? In other words, I am trying to work out, is this amount of £60 million to £70 million the total amount should it all fall apart?

Phil Thomson: A lot of this will have to be spent. It really does depend on what the ultimate destination is. If we diverge very significantly, we will probably have to absorb a lot of these costs. We will incur these costs, because, going back to why I think what this Committee is doing is so important, we cannot and do not want to be in a situation as a company in March 2019 where we have some sort of disruption in supply. We know we have to make plans.

Q290 **Chair:** The sooner you have certainty, the better, presumably is what you are saying.

Phil Thomson: Absolutely, yes.

Q291 **Chair:** To be clear in my own mind, is £60 million or £70 million what you estimate you are going to have to spend anyway just in case, or is that the final sum?

Phil Thomson: At the moment, that is our working assumption. We are going to have to spend something like that to be as prepared as we can be in a no-deal, hard Brexit situation.

Q292 **Chair:** So you are expecting that anyway.

Phil Thomson: Even if we have a smooth and orderly Brexit process, and we work through with a new FTA or a new arrangement, there are going to be costs of that magnitude anyway, but they will probably be more phased. We will probably be able to reallocate some of those costs elsewhere. It may not be as significant as the contingency plan, but the reality is that we are already going to have to spend some of that.

Q293 **Chair:** What about for you, Hugo?

Hugo Fry: We are not so precise in the amount that we have allocated, and it will not be quite as big as John, who has six labs and we have two, so you can see the difference proportionally. The most expensive bit is moving the labs and getting the people, and that whole 15 to 18-month process we were talking about. Proportionally, it is likely to be in that order.

As to the regulatory bit, in actual cash terms, that is less, but in terms of slogging through the work, of getting the regulatory people, there is the fight for expertise as we were talking about before. There is a whole bunch of us out there looking for expertise who can take these several lists of products. It is a technical job, but it does have to be done and it is very important. There is a lot of work, and I reinforce the point that we have to do this now.

Q294 **Chair:** You have to do it anyway.

Hugo Fry: We have to do it now.

Chair: I know Ben has a follow-up point and then we will come to Caroline.

Q295 **Mr Bradshaw:** Given what you have just said, and given that the discussion about alignment is absolutely live, as we speak, in the Cabinet, and we had the vote last week where Parliament finally asserted itself as an anti-hard-Brexit Parliament, why have you not been more publicly outspoken about this? Why are we not seeing what you are saying to us everywhere on the front pages of the newspapers about the extent of this disaster and what needs to be done to rectify it? The politics of this is changing. Are you moving fast enough with it?

Phil Thomson: That is a very fair challenge and a good question. The reality is that we have been working over several months to get to understand what the true position is. We have now got that. I would say both from my engagement with the Government here, certainly with the Department of Health, and also with BEIS and DExEU, that there is a good understanding of this, certainly within the official level. I also think

there is a good understanding in the Commission on this, going back to one of the questions that was asked earlier.

Having said that, one reason why I was glad to be asked to come here today was to make this public comment, because we need—and industry needs—time to make these changes. The earlier we can get clarity on a transition process, the better, and in the event of a hard Brexit scenario, we need to be putting in plans, whether it is emergency legislative plans or unilateral action that the Government have started to talk about, to make sure that in that worst-case scenario we can manage supply and can make sure there is not disruption. The costs, I am afraid, are going to be incurred. All I would say to you is that we are going to do everything we can to minimise disruption. Obviously, that money could, though, be being put behind clinical trials, and I can tell you right now that we have a cancer portfolio we are trying to invest in, into which that money should be going, to develop the next generation of cancer medicines. That is something—I will be honest with you—that we are wrestling with internally inside GSK.

Q296 **Chair:** It would be very helpful to the Committee if you could write a further note to us setting this out in more detail.

Phil Thomson: I would be very happy to do that.

Chair: That would be very helpful.

Q297 **Dr Caroline Johnson:** I want to bring you back to one point that we have been hearing about from the previous panel, but basically to industry. It has been said that there is a delay—some countries get the medicines first and some get them later. It has been suggested that that is all to do with the size of the market. We were given an example earlier that Switzerland, a country of about 8.3 million people, received its drugs six months later. It has also been put to me that Japan, a country of 127 million people, receives the drugs a year or two years later. How do you create the hierarchy that you have described? On that basis, it is not entirely down to population size, is it?

Hugo Fry: In a previous life I did this, so I will share my experience. You have to put Japan apart in one way because it has a very different approval pathway system. It is the same thing, but you absolutely have to have a specific critical mass of Japanese patients, and often you design the study specifically for Japan. You have to have what is called a phase I bridging as well. So, that I put apart. You can choose to do that in parallel as, in my last one, we did. We ran the Japanese programme in parallel and submitted just after the FDA, which was quite unusual, but we decided to do that because we thought the drug was particularly relevant in Japan. However, sometimes Japan can be years later.

Q298 **Dr Caroline Johnson:** What would be a good comparator? Switzerland, because it is such a small market, is not a good comparator, but what would be a good one?

Hugo Fry: Our goal is to get innovation into patients. That is the reason we do things. It is all about the patient. Then it is the size of the markets, in terms of patient numbers—US and Europe. That is a huge amount of work. Those two processes in parallel are as far as it stretches, because the way the process works is that you submit and then you start answering a whole load of questions you get back; these can extend to pages and pages at different points in the process. FDA is one and EMA is one, which is a great advantage. Switzerland, Australia and Canada are one each, and the fact that they are small does not mean they have any fewer questions. They still need answering, so you need the same, or almost the same, capacity to answer those questions.

Q299 **Dr Caroline Johnson:** But Australia would give you an opportunity for three times as many patients as Switzerland, would it not?

Hugo Fry: Yes. You might do Australia, except that, then, you have to take into account whether the patients would really get it, because the regulatory approval is the start and then you have the access to things like NICE, or whatever the health technology assessment process is in that particular country; so, you add that in as well.

Q300 **Dr Caroline Johnson:** You are saying that if we took the opportunities described by one of our previous panellists to be extremely efficient in the post-licensing or post-approval phase, that would enable us to be more competitive and be higher up in the hierarchy.

Hugo Fry: You could catch up. The UK would definitely be third then, if you want to put it in the hierarchy, but it could catch up a lot of time by streamlining that, and it is even talking about doing it in parallel. I know there is a lot of discussion around that, but, yes, it could. What I think is unlikely, thinking about it now—I cannot think of a scenario where it would be the case—is that the UK, in the pure registration period, would be ahead of the other two. However, there are opportunities to gain time elsewhere in the process.

Q301 **Dr Caroline Johnson:** We are looking at the effect on patients. The effect on them might be negligible, or even not there at all, if we were very streamlined in our process.

Hugo Fry: If it was very streamlined and rapid to market, to pricing, to the pharmacy shelves or the hospital shelves or wherever the distribution channel is, yes.

Warwick Smith: There are parallels with the generic industry where a number of countries around Europe have really unnecessary regulatory barriers in place after the marketing authorisation has been gained. In Portugal, typically, a generic will enter the market nine months after the UK because our post-licensing procedures are less bureaucratic than they are in other member states. You can see that that works. There are parallels in a different market.

Phil Thomson: Just to answer your question about hierarchy, and I heard your question earlier, an analogue, I think, is Germany. That is a more sensible patient population size. Ultimately, while you have the harmonisation of the EU regulatory system with European countries, as somebody said earlier, domestically, it is how it then gets adopted. If the UK wants to be competitive, this is where it could take an advantage. I think the UK is making good strides in this space because it has started to put commercialisation officers into the NHS.

The key here, I think, and where the UK could make a big difference, is around flexibility. To give you an example, we run a huge vaccines business. When we operate tenders over a period of five or even 10 years, there is a lot we can do to make sure that we can flex on price, be flexible on cost of goods and on supply. If we were able to create more flexibility in that commercial realm in the UK, I think you could start to offer a competitive advantage relative to other countries around the world. That is one area that we could definitely look at and focus on.

The question here, of course, is that the NHS needs to take cost reduction and it needs to manage its costs appropriately, but, as everyone with a good commercial opportunity knows, it is not just about cost reduction but where you can invest for the longer term and how you get a good return. If we have that kind of mindset in the NHS adoption—not the licensing but in the NHS adoption—that could be a very interesting place for the UK.

Hugo Fry: Can I reinforce that message, because we are a manufacturer of vaccines? In adoption, the UK, in medicines, is quite far down the tree. In vaccines, it is right at the top, so I can only reinforce that point. If there could be a mechanism for medicines where the UK can have the same level of adoption and rapid adoption or uptake, as we often call it, then the hierarchies kind of go out of the window in Brexit because more patients are getting more medicine.

Chair: That is always going to be a challenging financial balance for the NHS, is it not?

Sitting suspended for a Division in the House.

On resuming—

Chair: We are quorate, so we will make a start again. Caroline will start with the next group of questions on supply chains.

Q302 **Dr Caroline Johnson:** We have talked about the fact that medicines are sometimes made in one country, or made in several countries and then delivered to another. What problems, if any, do you envisage with that process and at what stages, when we have left the European Union?

Hugo Fry: It really does move. There are two I will highlight and then I will leave some space for others. One is, where there was free movement before, I have not found anybody who is able to tell me the potential

blockages on borders. Exactly as Phil was saying earlier, we have several products that go from the States to Europe; that we can do, because we are used to doing it. Throughout Europe, when products move from France to the UK, back to France again, back to the UK, or from Belgium, we have no idea how long they will be held up at the different borders. We do not know how much time to add in to our supply chains.

Q303 **Dr Caroline Johnson:** How much time do you add in to the supply chain to move things between the US and Europe?

Hugo Fry: We do not add anything in because it is built in and we know that it takes a few weeks, but that is a documented process where there is resource to do it. The paperwork is well defined and is there. We all know that we would all love to copy and paste, but it is never as simple as that. There are a number of consultants who have put together estimates of this. PWC has done one. Its estimate was so wide that it might as well have said, "We don't know how long." It probably will not be like that forever, because eventually there will be a fluid system, but it is that period. It comes down to companies fighting for the same resource, where we will all look for warehousing space because we need to stockpile it, if we can stockpile, which is difficult for certain complex biologicals, where we are already too late because they have lead times, or certain vaccines have massive lead times. Again, we are right at the edge of the window of opportunity for thinking about stockpiling. Ultra-orphan drugs is another one where there are complex manufacturing processes.

Q304 **Dr Caroline Johnson:** Would there automatically be a blockage, or would there only be a blockage if either we or the EU decided to put one in place?

Hugo Fry: If you kept open borders, whatever that means politically, then no, there would not. The status quo is no blockage.

The second point I want to make is about WTO rules, and this is something again we discovered ourselves. Even though we have committees and people looking into it, we discovered relatively recently that although it is tariff-free for pharmaceuticals and their component products, it is an understanding. The list dates back to 2010 and has not been updated since. It is a bit more of an understanding than an actual list, because the actual list does not contain everything that has been registered since 2010. Okay, that could potentially add cost to the system, because there will then be tariffs, you will have the administration of collecting them and all the rest of it. I will put the cost into context, though, just so that everyone knows. The cost pales into insignificance next to the loss in the value of the pound; because prices are fixed for the NHS in pounds, the difference costs us millions and millions every year already. But still, it is a cost.

Q305 **Dr Caroline Johnson:** What about you, Mr Thomson?

Phil Thomson: It is quite hard to answer your question honestly, given the levels of uncertainty. To give you a sense of the scale, every month we have about 44 million packs of products moving between the UK and Europe, so there are very significant volumes going across. If, as Hugo said, we are not part of a customs union, and if—in answer to your question about what goes in—the barriers that go in are either financially around tariffs or administratively around borders, such as when on either side of a border a VAT form needs to be filled in, that is an administrative cost to us, obviously, but it is also a resource implication as well, and that is a time burden. Those are the things that we are trying to factor in. In all honesty, it is very difficult to do that not knowing where, ultimately, we are going to be in our relationship with the EU.

Q306 **Dr Caroline Johnson:** Have you had discussions with Ministers about those issues, and how have they responded?

Phil Thomson: I would say that officials and Ministers have been very receptive to understanding that, but I would say they are also challenged because they are not able to provide us with the specifics so that we can start to say, "This is how much it costs," and what the ring fences are. All we can really do at the moment is work on the scenario that, if we are not part of the customs union, we have to assume that some of these burdens—if we can use that word—or barriers are going to be put in place. How, therefore, we minimise that should be part of what we discuss in the next arrangement or the future arrangement with the European Union.

Q307 **Dr Caroline Johnson:** It is basically that you are waiting for the negotiation process to complete, but in the meantime you are preparing for the scenario in which there are barriers.

Phil Thomson: We are preparing as much as we can do, but, to be blunt, until we are clear about what that future relationship is, it is quite hard to prepare for. Of course, at a company level, we can put more resources in to our import/export organisations. I could not tell you right now whether that is 20 or 50 people, and how much that is going to cost, because I just do not know what the future looks like in that.

Q308 **Dr Caroline Johnson:** You talked about the issue of VAT forms, but also about the qualified people. Can you explain how that qualified persons process works and what changes you may or may not need to make after Brexit?

Phil Thomson: Essentially, when the product is released it has to be tested to make sure that it is bona fide product and it is the same—

Q309 **Dr Caroline Johnson:** Is that for every batch or every time you have a new product?

Phil Thomson: It is for every batch. You have laboratory-type facilities, usually in your manufacturing sites, where you are essentially, literally, testing the products—chemical testing. That has to be done according to

regulatory standards in the right kind of clinical environments and also with what they call qualified people—so, qualified personnel. They exist, but there is a limited pool of those people, and, as we talked about earlier, there are the timelines required to implement this. In our case, we are looking at third party laboratories, not building our own labs, because it will take too long for us to build the lab, kit it out and get it approved. We are going to have to look at third party suppliers here.

Q310 **Dr Caroline Johnson:** How long does it take to train someone to be a qualified person?

Phil Thomson: I do not know. I would have to come back to you on that.

Hugo Fry: Different companies have different aspects and ways they treat this. Sanofi always prefers to have our QP—our qualified person—in the factory releasing in situ, because they understand the manufacturing process and where the problem might be, and sometimes it can be fixed. Again, you gain efficiencies in time and money, and get more patient output available, which is very important in biologicals and vaccines, in particular, where there are sometimes chronic shortages. When you start offshoring your QC and QP, you lose that. There is a danger of more wastage in the system and the chances of shortages go up when you start moving to that system.

Q311 **Dr Caroline Johnson:** Presumably it is a short-term solution, is it not? In the short term you outsource it; in the long term you build your own and put it back in-house.

Hugo Fry: Or—and I am not saying this is happening—one of the scenarios is that you move the manufacturing out of the UK.

Q312 **Dr Caroline Johnson:** But, Mr Thomson, you have invested heavily in the UK recently, so you do not, presumably, agree with that scenario of wishing to move, because you have invested in more facilities here.

Phil Thomson: As I said earlier, we strongly believe that the UK can be very competitive, and it is competitive genuinely, but that is contingent, in my view, on implementing the life sciences strategy well. Depending on what our future arrangement is—but if it is, let us say, more divergent—then the UK really needs to think about where else it can improve its competitiveness. We talked about the commercial aspects before, for example. If the UK adopts a more, can I say, convergent approach—so, in other words, there is more regulatory alignment—then ultimately that is supportive for the UK, because you are then building a competitive UK proposition, which is still very connected with Europe, China and the US and wherever else it is, and you get the best of both worlds. If you do not invest in the UK and you do not stay connected, it makes the UK less competitive, and that is the risk we face as a country. I personally think we have to do both of those.

Warwick Smith: This is where, if you like, competitiveness of the industry and safety of patients and the security of supply come together. As I think Hugo said, you can batch-test on your own account or you can go to a third party laboratory. On the numbers that we have calculated, if you are doing it yourself, the revenue cost is maybe £600 per batch; if you are outsourcing, it is £1,000 a batch. A sizeable generic company will release 24,000 or 25,000 batches per year. At the moment, that will be done, potentially, through one QP for the EU, who will be based either in the UK or elsewhere in the EU. The laboratory work will be done in the EU, which could be the UK.

If there is no arrangement between the EU27 and the UK going forward, the risk is that all those facilities and people have to be duplicated. That plays to cost and to delays in the supply chain because you are not as efficient, going to the point that Hugo made. It plays to the point that you are scattering your safety-critical procedures rather than having them concentrated. So, to reinforce the point I made earlier, duplication is exactly the wrong way to go. Therefore, we need some sort of mutual recognition, if things are going to go the way they are, not just for the transition period but for thereafter, otherwise, we are putting up costs, we are potentially weakening safety and we are not looking after patients as we should.

The same applies—I think Professor Boyd made this point—to pharmacovigilance and keeping records of reactions of patients to medicines. Just basing that on the UK does not give the same degree of safety and security for patients as basing it on the EU. So, a mutual recognition, or in some way arranging for the UK regulatory processes to remain part of the EU or allied to the EU, or whatever form of words becomes acceptable, but fundamentally in the same ecosystem, is crucial to efficiency and patient safety.

Q313 **Dr Caroline Johnson:** Does that apply in both directions? The EU, presumably, will not wish to duplicate things either.

Warwick Smith: It is important that we do not just focus on medicines coming from the 27 to the UK. Medicines go in both directions. We are a significant manufacturing base. Twenty-five per cent of the production of my largest UK manufacturing member leaves the UK. Most of that will go to the EU, so there is an impact; but it is again the difference between the impact being spread across 27 and the impact being borne by one.

Q314 **Dr Caroline Johnson:** The 27 to one, in terms of population, is not 27 to one, is it, because it is about eight? We are about one in eight of the European population.

Warwick Smith: Yes.

Q315 **Dr Caroline Johnson:** So, the volume of data collected on people in the UK is a much more significant proportion of the EU data as a whole than one in 28.

Warwick Smith: Sure. It is still a significant factor whether it is eight or 20.

Phil Thomson: I think you are making an excellent point, and you may have said it in your opening, that this area is win-win potentially.

Q316 **Dr Caroline Johnson:** For both sides.

Phil Thomson: Maybe win-win is the wrong way to describe it because it is just fundamentally important for both sides to get this right. I think you are absolutely right to be thinking about how Europe sees this and the loss of the UK, whether it is pharmacovigilance or that the UK gives more approvals for post-approval studies than any other European country. We have enormous excellence and capacity here in the UK. The UK contributes disproportionately in many regards to what Europe does around health. Therefore, it is in both our interests to prioritise health and the impact particularly on patients in this next round, and what happens with the future arrangement.

Q317 **Chair:** Presumably, as well, it is the opportunity cost of all this. You are spending money on all of this bureaucratic process rather than spending it on repurposing drugs, for example. Have you made an estimate, Warwick, of the cost of all this if there isn't a deal?

Warwick Smith: I have lots of individual figures. We have not managed to get a figure across the industry, but I was impressed with some of the figures my colleagues gave earlier. It will be at least that for the generic industry—a typical generic company. Once a medicine comes off patent, a dozen or 20 companies will pick it up, so there are many more generic licences out there than there are originator licences, if I can put it that way. The risk there is that, as costs go up, some companies will relinquish their licences and their marketing authorisations, so there could be fewer manufacturers in the marketplace, and that, at the moment, keeps the market, in normal times, pretty resilient. The more manufacturers there are of the same molecule, the more options we have if there are supply difficulties. That is a key objective for the generic industry in keeping that competitive multi-source market going.

Q318 **Chair:** The multi-source market has a potential impact on patients. If we lose that, we are more likely to end up with supply chain problems if a manufacturer experiences difficulties.

Warwick Smith: We are.

Q319 **Chair:** The other point, I guess, is the cost of drugs to the NHS—how much they could potentially rise. Have you made any estimate of that at this point?

Warwick Smith: I support the point that Phil made that currency fluctuations have been the most significant impact so far, and when your cost of goods increases by 20% that is obviously quite significant.

Q320 **Mr Bradshaw:** I am sorry, but can I just ask something about that? How

much of an impact has that had on NHS costs?

Warwick Smith: I do not have a number. I have not seen a number.

Hugo Fry: There are a couple of exceptions, but, generally speaking, it has not added anything. What it does, though, is it impacts us. As a European-based global manufacturer, we absorb the 20% decline directly.

Q321 **Mr Bradshaw:** Can you put a ballpark figure on it?

Warwick Smith: It is just a 20% cut in your income.

Hugo Fry: It is 20% of our turnover—

Q322 **Mr Bradshaw:** Gone.

Hugo Fry: Gone.

Q323 **Dr Williams:** I want to go back briefly to customs. I am interested in what the impact would be on patients if there were delays or disruptions to imports or exports.

Phil Thomson: Obviously, it depends on what kind of custom barriers go in or not, as the case may be. The concern for patients is more if that is done in a disorderly way in a hard-Brexit scenario. That is where you could potentially see impact. That kind of scenario is certainly again where I have the anxiety around the supply chain because of the time, frankly, to be put in. We need to be able to have a transition period and understand how it will operate. We need to ask the Government for clarity not just on whether there will be a transition period, but what will be the operating principles of that transition period, if it is status quo. Certainly, from our perspective, no change to the regulatory scheme, and to operate on a status quo basis while we make these changes and put these contingencies in place, is by far the best scenario for us. If we can do that, we can say that, hopefully, we will be able to minimise disruption as much as possible. If it is in that first scenario, though, it is less certain.

Q324 **Dr Williams:** Are there any medicines that are particularly time-sensitive or temperature-sensitive that could potentially be affected by a long or complex customs process?

Phil Thomson: I think in the manufacture of our current products, from a GSK perspective, we have those well controlled and well managed. While obviously there is freedom of movement and it is frictionless at the moment—for example, with regard to vaccines that need to be refrigerated—it is already in our processes, so I think the risk is not necessarily there.

Coming to your question, if there is no clarity on customs, that obviously creates uncertainty and possibly results in disruption. If you get into a scenario where you have very hard, draconian barriers as a result of

customs issues, the companies can work through it, but if there is not that transition period to do it, it becomes challenging.

Q325 **Andrew Selous:** I want to ask about the World Trade Organisation rules and what the impact would be on the life sciences sector and the trade in life sciences. If we move to those WTO rules on 29 March 2019, what would be the practical impact on your businesses and how would that affect patients as a result?

Hugo Fry: I mentioned it a little bit earlier. There is a mutual understanding about WTO rules around pharmaceutical products and their component parts today, which is understood, and they move without any tariffs. However, the official list was last updated in 2010, so there are things missing from it. If that was implemented to the letter of the WTO rules, then there would be tariffs come 29 or 30 March, or whenever it is. Therefore, that would add cost into the system.

It adds costs several times, again coming back to the point that the component parts move one way across and then they move back to be what we call secondary operations when we package them and fill, and all those sorts of things. If they were not on the list, there is that potential. So, that needs some working through. I am pretty sure about that.

Q326 **Andrew Selous:** Without wanting to lead the witnesses, as it were, I imagine that if we were on those WTO rules it might have a bit of a deterrent effect on future investment within the UK life sciences sector.

Hugo Fry: It comes back to the point that the biggest impact on those kinds of decisions is the strength of the pound today for a company such as ours, which is a European-based, global pharma company that sells in bands of a fixed NHS list price that does not change, and then we bring it back into euros and have a euro P&L, and therefore you have lost that value.

Phil Thomson: We are obviously in a different place. To answer your question, if moving to a WTO regime resulted in tariffs, obviously that means we are not competitive. As Hugo said, the issue here is that there is what I would call an administrative need to update the WTO list of medicines. If that is not done, that potentially is an issue. Frankly, I think that is more administration.

The issue, much more fundamentally, is that if WTO rules around medicines were to change in the future and there were tariffs enacted, the UK is operating to that, and obviously the European system is not, which is a competitive disadvantage.

Q327 **Andrew Selous:** I am curious about this last updating in 2010. I think there are 1,000 products and 700 component products awaiting introduction on to the list. It seems quite a lengthy period of time not to have done any updating. Do you know if there are any plans to try to make it a bit more of a live, ongoing current process, or perhaps you are not overly familiar with the inner workings of the WTO?

Phil Thomson: It is a very good question and I asked the same question and do not have an answer for you. I do not know why, and I am certainly not aware of any plans at the moment for that to be updated.

Q328 **Chair:** Is that something with which you are more familiar, John?

John Wilkinson: Unfortunately not, because my clients tend to be still at the development stage, and the products they use are in very limited numbers for clinical trials. If there are tariffs as they bring things in to the UK or other countries, it tends to be a minor part of the cost of a clinical study.

Chair: Thank you. All of you, I think, were here to hear the earlier panel, and you will know we had quite some discussion around regulatory alignment and the impact of that. The consensus seemed quite clearly that there would be major problems if we moved away from regulatory alignment around the infrastructure about recruiting patients. Is there anything that you heard earlier that you would disagree with or you would want to add to from the evidence that we heard earlier? No. Right. Thank you.

I am conscious that I do not want to detain you unnecessarily to repeat things, so, if you feel you are in agreement with that, we could probably move on to Andrew. Did you feel you had anything else you wanted to add?

Q329 **Andrew Selous:** Not really. Probably the same applies for the next set of questions here on the international influence of the UK in the life sciences sector. Is there anything more the Government can do to try to maintain that? You have spoken favourably of the life sciences strategy announced on 6 December, and I think we have been through the various pitfalls. I do not know if there is anything else you would like to add to that, but possibly not because it has been covered.

Phil Thomson: At the risk of not detaining the Committee too much longer, the only thing I would add, which is where the UK has competitive advantage, is in the global health space. The UK under DFID and under different premier leadership has demonstrably had an impact in the global health space, whether it is in malaria, HIV or tuberculosis. Those issues are global in their risk, but they are also global in the way in which they need to be dealt with. Antimicrobial resistance is a great example of this where the UK has, frankly, helped lead this agenda and how we solve it.

All I would say, to add to what was said earlier, is that in that space the UK has leadership and can still make a big difference, and certainly whatever happens with Europe, in interacting with bodies such as the United Nations and the WHO in the health space, the UK has a clear role there and should play a role in that going forward.

It is not necessarily directly related to Brexit, but to your question about influence, in health, as we talked about, science has no boundaries and

health has no boundaries, geographically speaking at least. Therefore, for us to play the UK as a global player is really important.

Andrew Selous: That is helpful, thank you.

Q330 **Mr Bradshaw:** What length of transition, if we can get a transition, would you like and on what terms?

Phil Thomson: I said earlier that our preference would be the status quo, so it would be easier on current terms, and certainly we would see that on the basis of it as a transition period not to delay but to implement, but with the certainty of the current system.

The timelines, which I mentioned earlier, in terms of putting in new facilities, are anything up to 18 months to three years. Obviously, we will work with the timeline we are given and we will have to prioritise, but, quite honestly, the longer the period can be, I think the more we can respond and say that there is less disruption or less risk of disruption and less impact.

Q331 **Mr Bradshaw:** Two years does not sound long enough to me.

Phil Thomson: I think two years is challenging, but, again, I would also say that a transition period is far preferable to no transition period.

Hugo Fry: Just to reinforce that, anything that maintains the status quo to give us that extra breathing space is beneficial. The only other thing I wanted to add to what Phil said was that I read somewhere a couple of things about people talking about "graded transitions." Certainly for Sanofi, that would not be a good thing at all because it just moves the goalposts halfway down the road.

Q332 **Chair:** You just want to change it once. That is a clear message that we are hearing. It is just to make sure that you do not have to make several changes.

Q333 **Mr Bradshaw:** Finally, Chair, returning to the big picture, Mr Thomson, you said a moment or two ago that you hoped the Government would treat your sector with priority in the negotiations going forward. That is what every sector wants and has told us—and every other Select Committee. The financial services sector, the farming sector and the manufacturing sector all want some special deal. It has been completely clear to everybody, or to most people, but perhaps not our Government Ministers, that there are no sectoral, cherry-picked deals out there. There is Norway, or there is Canada, or there is the status quo. There is no "Canada plus plus plus," so why are you not just arguing clearly and openly, given that there is probably a parliamentary majority for this, for us to stay in the single market and the customs union?

Phil Thomson: First, I would like to say I am not sitting here pleading for special status for the sector. I am, though, pleading for patient safety to be prioritised in the next round of negotiations. I want to be absolutely clear about that. The reality for us as a business is that we must respond

to the environment, and the environment is obviously dictated by the vote and the will of the people. Clearly, for business, as you very well know, more certainty is better for us. The European regulatory framework in our space, in pharmaceuticals in particular, is very strong and works well. That does not mean that the UK cannot move forward on a different pathway, but if it is going to move forward on that different pathway we absolutely need time and it needs to be done well.

Going back to my earlier point, at the same time as we move away from that, if that is where we go, we also need to invest in the country and deliver on that strategy.

Q334 **Mr Bradshaw:** I want to pull you up on something you said. You said your strategy relies on the vote and the will of the people, as it has been interpreted by the Government to mean leaving the single market and the customs union. That was not in the referendum, and the vote last week, as I repeat, was a very significant moment for Parliament putting its mark on this. It will be interpreted by Parliament in the end, not the Government. Parliament is sovereign. As I say, I believe there is a perfectly strong chance that we can stay in the customs union and the single market. I think that is where we will end up, so why are you not arguing for it? You are one of our main sectors, and thousands of jobs and millions of pounds, as we have just heard, are in the balance here. You seem to be incredibly timid about standing up for what you think is in your companies' best interests.

Warwick Smith: I am willing to be a little less timid because I do not have shareholders, if I could put it that way. My position and the position of my association would be that we are not a political body. We do not have political views. We represent the interests of our member companies and, through them, how we best serve patients. I think it is reasonably and responsibly our job to tell you, our lawmakers, what we need to be able to perform that function most effectively. I do not think we should try to supplant you in saying what that means in policy terms, and certainly in the slightly frenetic situation we are now in around these corridors.

For me, it is very simple, and we have gone through most of the issues this afternoon. There is a big issue about batch testing and batch release that we will face if we go ahead without some sort of alignment, some sort of mutual recognition, or something like that. There are risks about hard borders, if I can use that phrase. We have been very clear openly in forums like this and behind the scenes with the Government in setting out clearly what we need to be able to make this sector work for patients. I do not think it would be responsible of us to try to give political lectures to Ministers or parliamentarians, but we will be very open in terms of what we need.

Q335 **Mr Bradshaw:** I am not inviting you to give political lectures. I am just inviting you to draw the logical conclusion of what you have said to me, which is that you cannot have just what you asked for outside the

customs union and the single market. That is patently obvious to everybody, including the soft Brexiteers in the Cabinet, so why are you not helping them and us make this argument?

Warwick Smith: I personally am very happy to walk you to the lake, show you the water and leave you to decide whether to drink it or not.

Chair: On that note, that is a very nice point to end this, unless any of you on the panel have any points that you feel you have not been asked that you would really like us to know about. As there are none, we are grateful to you all for sharing your expertise this afternoon. Thank you.