



Public Services Committee

Uncorrected oral evidence: Medicines security

Wednesday 15 October 2025

11.05 am

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Members present: Baroness Morris of Yardley (The Chair); Lord Blencathra; Lord Bradley; Baroness Cass; Baroness Coffey; Lord Laming; Lord Mott; Baroness Pidgeon; Lord Prentis of Leeds; Lord Shipley; Baroness Wyld.

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Questions 1 - 14

Witnesses

I: Keith Ridge, former Chief Pharmacist of England and Wales; Dr Paul-Enguerrand Fady, Centre for Long-Term Resilience; Dr Emilia Vann Yaroson, Operations and Supply Chain Management, University of Sheffield.

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Examination of witnesses

Keith Ridge, Dr Paul-Enguerrand Fady and Dr Emilia Vann Yaroson.

Q1 The Chair: Welcome to this meeting of the Public Services Committee, the first meeting in our new inquiry into medicines security. I welcome our three witnesses today and start by asking them to introduce themselves.

Dr Emilia Vann Yaroson: Hello, everybody. Good morning. I am a lecturer in operations and supply chain management at the University of Sheffield.

Keith Ridge: I am here because I used to be chief pharmaceutical officer for England from 2006 to 2022.

Dr Paul-Enguerrand Fady: Hi, everyone. I am a biosecurity policy manager at the Centre for Long-Term Resilience.

The Chair: It would be useful to start by trying to get an overall view, a summary, of where we are in this area in terms of the key risks to the supply of medicines. I will start with Paul-Enguerrand on this. How would you sum up the key risks to the supply of medicines in the UK?

Dr Paul-Enguerrand Fady: There are three main risks to highlight to the committee. The first is overconcentration of supply for UK medical countermeasures and medicines, which are terms I will use interchangeably based on the jargon in my specific subfield. There is overconcentration of supply of medical countermeasures coming from very few countries and from one region. Asia produces a lot of the medicines that we use here in the UK, and specifically India and China account for a very large portion of the medicines that we import. There are 93 active pharmaceutical ingredients or APIs—again, a term that I will use, which basically means the part of a pill that actually makes you feel better—that have no European manufacturers whatsoever. Clearly this presents a risk to our supply chains.

The second thing to highlight is the lack of visibility in the UK supply chain for medical countermeasures, which stems largely from poor data integration. We collect a lot of data in this country at government level and in private industry. Those databases do not always speak to each other very well. There has been some progress, and I am very happy to say that the GSCIP, the Global Supply Chains Intelligence Programme, which is housed by the Department for Business and Trade, is making some headway in allaying that concern, but there are still improvements that can be made there. Especially regarding integration of data streams from different government departments, there still remains some siloing.

Finally, there is the lack of diversification in domestic medicines manufacturing. We do not make many medical countermeasures in this country. When we do make them, we make very few types. That exposes us to some risk as well.

Keith Ridge: I agree with all that. To follow it, I will in part draw on my experience during the pandemic and where I led professionally on the medicines supply chain, but also looking at current government policy around documents issued by the Cabinet Office that I was always very familiar with, such as the national risk register, the UK resilience action plan, the chronic risks analysis and a document recently published by the Department of Health and Social Care that tries to introduce more mitigations in relation to some of the risks that have been identified.

One thing I am concerned about, and highlight as a confirmed risk, is that stockpiling is not current government policy. I think about the pandemic and the efforts that we had to go to globally, and of course in this country. There was the global demand for medicines that kept people alive in intensive care units or ITUs. I worry that there is no policy around stockpiling for critical medicines. Put that alongside what the EU is doing in terms of the Critical Medicines Alliance, which for those of you who do not know is a collaboration between the public and private sector looking at supply chain vulnerabilities and thinking about what critical medicines should be. It has generated a list of those critical medicines. Look at what the US is doing, putting to one side the current debacle around pricing and things. Clearly there are executive orders in place around API manufacture.

Coming back to Europe, Germany has a six-month supply stockholding at manufacturer level. France is doing something similar. We have a policy at the moment where, as Paul-Enguerrand will confirm, those Cabinet Office documents do not specify the medicines supply chain as a risk. To be fair, they point out supply chains in general. People such as the Department of Health and Social Care, which has the lead here, will follow on from that. Yet, overall, there are some significant risks generated by the fact that the Government have taken a view of no stockholding policy.

I have a couple more points that may have been overlooked. There are a couple of specialist supply chains, if you see what I mean, to draw to your attention. One is called the aseptic or compounding supply chain. I know that you have touched on this in the past—in fact, more than touched on it—through your work on homecare medicines. Lord Carter and I have been heavily involved in reviewing aseptic provision in the NHS. For those of you who do not know, aseptics are where you take a medicine where the dose is very particular and a pharmacy in a hospital or a commercial compounder has to manipulate that product in order to make it suitable to be administered to the patient. Chemotherapy is a good example. Lord Carter was commissioned by the Government to review this area under the previous Administration. All the recommendations from that report were accepted. Basically, we found that the NHS estate in this area was poor, it needed investment and there needs to be more activity with the private sector to provide these services. While there has been a good start in terms of implementation, that has certainly slowed down under the new Administration. Bearing in mind that with chemotherapy, at a 5% annual increase a year, the

modelling within NHS England essentially says that by 2030 there will not be sufficient capacity to deliver chemotherapy in England, that is a concern.

The other specialist area is around radiopharmaceuticals, which again often get overlooked. These are critical to both diagnosis and therapeutics in some areas. Again, the estate in the NHS is not what it could be. It presents a complex supply chain, depending on things like nuclear reactors and so on in other countries, and there have been shortages in the past here. Those two specialist areas sit alongside the main general supply chain and the risk that I highlighted particularly around no stockholding and no real identification in Cabinet Office documents that the supply chain is at risk. I do not know if that helps.

The Chair: It does. Thanks very much. Dr Vann Yaroson, do you have anything to add there?

Dr Emilia Vann Yaroson: I have two major things to talk about. First, the world pharmaceutical supply chain as a whole is all interconnected. There are peculiarities, such as that all over the world there are limited manufacturers that manufacture for an increasing population. We have this limited capacity and limited manufacturers, and then we have peculiarity in the UK where procurement is 70% by the NHS and then pricing and reimbursement strategies. That makes it very difficult to make the UK resilient where we are looking at cost efficiency instead of resilience and flexibility. Those are the two things that I would like to highlight.

The Chair: I have one follow-up question before I bring in Lord Blencathra for a supplementary. Am I right in picking up from what you said that the situation in the UK is worse than it is in some other developed countries? Is that a correct summary from what you said?

Dr Emilia Vann Yaroson: Just because of its peculiarities. If we look at Germany or the US, the US is more competitive. It has manufacturers that will be willing to manufacture based on price. In the UK, because we have a price cap and the NHS is always trying for more cost efficiency, you are left with limited manufacturers within the economy to be able to compete on price. When there is a shortage of a medicine, it will take a long time for you to find the second person or manufacturer to come back and say, "We're going to supply". Remember that regulations for manufacturing of pharmaceuticals are very stringent. Passing into law or getting manufacturers to come into our economy takes a long time. If there is a shortage, the bounceback and the resilience that we are looking for is an issue, and that needs to be addressed.

Lord Blencathra: I have no interests to declare.

The Chair: I have no interests to declare, either.

Q2 **Lord Blencathra:** We read here, and I think you have said, that China and India dominate the world market for APIs at over 80% of production.

How has that come about? Do they have unique pharmaceutical brilliance, is there access to natural resources, or is it cheaper production costs? How have they come to dominate the world?

Dr Paul-Enguerrand Fady: Most of it is lower costs for manufacturing, and historical lower costs for manufacturing. Energy and labour costs in particular have been historically low in China compared to the UK. A big campaign of offshoring by private industry began in the 1990s that was quite intentional to lower costs and therefore increase profits. At the time, that was seen as really positive, with no view for the long-term resilience of the nations within which they were initially manufacturing. The issue there is that it is incredibly difficult to then reshore. It is possible; it takes specific political will and an expenditure of political and financial capital.

I have spoken to a number of experts who oversaw that offshoring process at big pharmaceutical companies. They pointed out that the offshoring initially began because of these lower cost burdens. I think the costs of manufacturing in China were something like 8% compared to the UK at the time, on the basis of power and labour combined. They said that the main issue is that there has been an erosion of the heavy industries that support API manufacturing, which then makes the reshoring much more difficult.

As an example, it used to be the case that aqueous ammonia was manufactured in the UK, which was used in fertilisers. It was also used in parts of the medical countermeasure manufacturing process. It is just one of those things that you could use for both. As the UK moved away from using aqueous ammonia in farming for completely unrelated reasons, those industries shut down. There was no longer a need for medical countermeasure manufacturers because they had also gone, so there is no aqueous ammonia being manufactured in the UK. Even if you wanted to bring back the API manufacturing that relies on that, you do not have the feeder industries. It is not as simple as saying, "We'll make this pot of money available and we'll draw back manufacturers". Entire industries that feed into that are lacking, so it requires a really distinct political will from the centre to say, "This is something that we value. This is something that we think is important. As a result, we will make sure that we have every piece of the puzzle in place to bring back those manufacturers".

The Chair: We will leave the follow-up questions on that until question 4, a question in its own right on that. Thanks for that.

Dr Emilia Vann Yaroson: There are economies of scale. Manufacturers want to stay in India and China because it is cheaper. If you have so many manufacturing firms together, we can feed on our knowledge. All manufacturers want to stay in China first, because it has the key starter materials that feed into APIs as well. They want to stay in China first and then export because it is cheaper. Initially, we used to manufacture the products here, but when it became cheaper and then demand for pharmaceuticals started increasing because people were getting more

aware of pharmaceutical products, it made sense to go to China and India. However, Covid showed us something else.

Keith Ridge: I just add that we have been very successful in driving down price. We have reaped the rewards of that over many years. I remember in 2010, when we decided that it would be good to secure the supply chain a little bit more as a consequence of driving down price, we established something called the essential medicines buffer stock. That was put in place across a quite considerable range of medicines with about three to six months' supply of individual products where, essentially, the Government paid the storage costs. It was a buffer stock, so it was rotated through the system. For one reason or another—mainly cost—that was removed in about 2018 or 2019, not long before the pandemic. Fortunately, there was still some left. One way or another, just to add to what people have said, we have successfully driven down price and reaped the reward. One thing that I should have said right at the beginning is that the current geopolitical situation is clearly a big risk to these complex supply chains.

Q3 **Lord Bradley:** Good morning. I have no interests to declare. How do medicine shortages currently affect patients? What is the current level of risk that patients may encounter?

Keith Ridge: It depends. On the one hand, having spoken to the current chief pharmaceutical officer for England, there are three coroner's reports that seem to be related to medicine shortages. On the other end of this, if a patient is unable to obtain a medicine, obviously there is a lot of concern for them personally. I am on two generic antihypertensives. If one was to go into short supply, either another supplier of that antihypertensive should be able to be found or it would be quite an easyish thing to switch from one antihypertensive to another. But for some medicines, you just cannot do that. Indeed, one of those coroner's reports is about a patient who was unable to obtain antiepileptic medicine. It is very difficult to switch between antiepileptic medicines. There are a range of those types of medicines—I would call them critical medicines—where it would be important to have resilience in the supply chain. Not to downplay this at all, there are others where it develops a high degree of inconvenience and anxiety among patients.

On the overall level of risk, most people receive their medicines most of the time. Overall, it feels to me that the level of risk is not as high as some would think, but there is certainly potential to heighten that risk because of the issues we are describing and the mitigations are not in place. There certainly are examples of fatalities through to people being admitted to hospital. There is a full range of consequences.

Dr Emilia Vann Yaroson: There is currently no data that captures its impact on patients. If I am a patient, I go to the pharmacy to get medicine and I do not get that medicine, there is no data to capture that I am anxious or go home looking for it. We have instances where sometimes when you ration a medicine for a patient there is panic buying. They try to buy it on the internet, and sometimes counterfeit

medicines infiltrate the supply chain. Anxiety has not been captured. Counterfeit medicines infiltrating the supply chain and their impact have not been captured. Sometimes we wait to see that there is a death due to a shortage and we call that a risk, but other, different types of risk are involved—even changing the colour of the medicine. Some patients are used to getting something green and then tomorrow they are given blue. What is happening? Upstream, they have been able to mitigate the impact, but to the patient they have not. “You are giving me a different colour”, or, “You are giving me the same medicine but in a different formulation. You must take injections instead of a tablet”. There is no data that has been able to capture this, so we cannot accurately measure the risk involved.

Lord Bradley: I think you answered my follow-up question. There is no measurement of the impact on patients, so there is not a system to improve.

Dr Paul-Enguerrand Fady: To answer your question and back up what Dr Vann Yaroson said, there is no systematic way to capture this data. The British Generic Manufacturers Association—now Medicines UK—has commissioned polling on an ad hoc basis. It is not systematic and not something that you can track over time, but provides snapshots. In 2024, a public poll by BGMA—Medicines UK now—showed that of all adults who have had a prescription in the past two years, 49% experienced some form of shortage or delay while trying to access medicines. That is half of the people who had prescriptions. Of those impacted, one in six went without their medicine altogether. I am not competent to say what impact that has and what the risk is, but that is some data.

The *Pharmaceutical Journal's* annual salary and job satisfaction survey revealed that 68% of pharmacists felt that shortages had put patients at risk in the previous six months. Again, they are more competent and qualified to say what that means. In terms of trends and shortages over time, as of March 2025, 31% of generic medicines had been in short supply for over 12 months. Over half, 52%, of generic medicines had been in short supply for six months. Overall, we should remember that as a percentage of generic medicines classed as “high impact supply issues”, it is only 0.09%. As Dr Ridge said, there are workarounds and ways to mitigate the impact, so the risk should be kept in proportion. Medicines UK said, “We track NHS England data monthly and now are seeing twice as many medicines experiencing shortages as they were two years ago”. Again, I am not qualified to say exactly how that translates to patient risk, but that is some information that I hope helps inform the committee.

Q4 **Baroness Coffey:** I have nothing to declare. I would interpret what you said, Dr Ridge, by suggesting that the risk is very low. Going further—and I appreciate that risk is always a matter of judgment—I do not quite know how much of medicine that is prescribed is discarded and how much of our stock is discarded because of lifetime. There has been this thing for a long time that we cannot return medicine and it cannot be

reused. Is that not just a waste when we consider supply shortages?

Keith Ridge: There certainly is wastage in among that. A general figure from the literature that people use in terms of adherence to medication is 50%, particularly in primary care. In terms of return of medication, there are some schemes around the world, for example in certain parts of California, where returns take place, but here the MHRA has taken the view that from a licensing perspective medicines would not be suitable for reuse because there is no guarantee of how they have been stored.

Baroness Coffey: That will vary from medication to medication.

Keith Ridge: Yes. In hospitals, there is more reliance on how medicines have been stored, and therefore typically a hospital pharmacy has a recycling type of policy, but not within primary care. The other thing to bear in mind is the community pharmacy reimbursement process, how that happens and how that will be managed if things were returned to a community pharmacy and reused.

Q5 **Lord Shipley:** Dr Ridge used a phrase that I did not understand, an "essential medicine". On other occasions the words can be "critical medicines". Is there a list? Do you have a list of essential medicines?

Keith Ridge: When we developed the essential medicines buffer stock in around 2009-10, the basis was the WHO's essential medicines list, which is what it says on the tin in many ways. It is a list from a WHO point of view of medicines that every country should have routine stocks for. Critical medicines, to use that terminology, is a subset of that. I have mentioned some that were deemed of that type in the pandemic such as things that enable people to be ventilated. On the EU's critical medicines list, I think there is something of the order of 600 medications. Does that help?

Lord Shipley: It is helpful. There clearly are internationally recognised, as I understand it, definitions of the words "essential" and "critical".

Keith Ridge: Certainly "essential". "Critical" is becoming more recognised.

Lord Shipley: The obvious reason is that what is essential for one person may not be essential for another person, or rather what might be critical for me as an individual—sorry, I have no interests to declare—may be for somebody else less important.

Keith Ridge: From a government point of view, in the UK there is no current critical medicines list.

Q6 **Lord Laming:** I have no interests to declare. I follow up on Baroness Coffey's question about waste and return. My colleagues know that recently I went into a local pharmacy to get some sticking plasters. While I waited, I noticed all these racks of prescribed drugs in their paper bags ready to go. I said to the lady when I got served, "You've been extremely busy this morning". She said, "Why do you say that?" I said, "Well, all of

this medicine". She said, "No, no, no. People go to the GP next door. They come out and then come straight to the pharmacy, give us the prescription, and then don't come back to pick up their drugs". Following Baroness Coffey's point, you mentioned that we can do some recycling in hospitals, but can we do it with GPs? I was absolutely astonished by that.

Keith Ridge: The majority of those medicines are probably repeat medication and are waiting to be collected. Admittedly, some will not ever be collected, but I think the majority of those will be repeat prescriptions.

Lord Laming: Let me just explain. When I asked the pharmacist a bit more about this, she said to me, "Waste is part of our life. We have to keep those for a certain period of time, and then when that time has elapsed we just get rid of them". Whether they were repeat or not, she said there is a large proportion of medicines that are prescribed but never collected.

Keith Ridge: I am not here to defend community pharmacy or indeed patient behaviour at that point. The recycling issue in primary care is more difficult to achieve than it is in secondary care for a whole range of reasons, including reimbursement.

Q7 **The Chair:** Before I go on to Baroness Cass for the next question, I will go back to the Care Quality Commission. We talked before about whether we know if harm is done. As part of our evidence, we had a letter from the Care Quality Commission. It has some responsibility here and was able to give us examples of medicines where there have been shortages, in a similar way as you did in the opening comments. Does it not have a responsibility to investigate the impact of that? I will frame the question this way: what is the responsibility of the Care Quality Commission in this area? Does any other regulator have any responsibility in terms of the impact on patients? Would it not be recorded as an admission to hospital if the reason for admission was the failure to provide the medicine outside of hospital?

Keith Ridge: It could certainly be recorded. Whether that data is collected centrally is another matter altogether. In relation to regulators, yes, the CQC would have a role, in my view at least. Bear in mind that I am no longer the chief pharmaceutical officer. Yes, the CQC would have a role in terms of investigating particularly poor-quality care. The General Pharmaceutical Council, the regulator for the pharmacy profession and pharmacy premises, would have a role as well if there was a particular issue about pharmacy professional practice or something to do with how the owner of the pharmacy or whoever had behaved. There are a range of regulators. It would be the MHRA if it was something to do with the safety and use of the medicine itself. A range of regulators have a role in this area.

The Chair: It sounds like homecare medicines again, does it not?

Q8 **Baroness Cass:** I have no interests to declare. Just before I come on to my question, maybe we have conflated some things in the conversation,

because there is current harm and then there is risk of harm. The risk of harm is related to two things, one the likelihood of a supply interruption and the other the impact of that interruption, which will be different if it is an essential or critical medication. We probably just need to unpack that a little bit.

Anyway, it is good to see Keith again. We worked together for quite a while when I was president. As you said, most patients get their drugs most of the time, so obviously the system, despite how fragile it looks, works for the most part. How effective are the current policies across the supply chain at either preventing or responding to medicine supply issues?

Dr Paul-Enguerrand Fady: Three policies and initiatives are worth highlighting. I will focus more on the manufacturer end because I think that others on the panel are better suited to talk about the patient-facing side of things. Looking at the manufacturer, R&D and developer end of things, there is a fund called the Life Sciences Innovative Manufacturing Fund, or LSIMF. It does what it says on the tin; it tries to stimulate innovative manufacturing in the UK in the life sciences sector. It is worth £520 million. We are delighted that this money has been made available by Government. Industry has been very welcoming of this fund. It is very easy to apply for. Everyone we have spoken to thinks it is very well administered by the Office for Life Sciences, which is great.

I just draw the committee's attention to the size of that fund, which is £520 million. That is a lot of money, objectively, but the cost of Covid was £400 billion, which is 1,000 times higher. I am not for a moment suggesting that £400 billion should be invested in life sciences manufacturing. That is clearly far too much. However, if the Government are really serious about wanting to safeguard the UK against biological risks and threats, the scale of the commitments needs to match the scale of the ambition. While £520 million is a great start, perhaps it would be worth looking at how that fund could evolve over time. That same money has been announced on a number of occasions. I think the fund was first announced in 2022, and successive Governments have said, "We have £520 million available", in 2023, 2024 and 2025. The fund has not changed in size over time to match the scale of the ambition of the Government, as set out, for instance, in their industrial strategy life sciences sector plan. Some thinking needs to be done around how that fund evolves. Again, it is a great start.

Baroness Cass: What is the scope of use of the fund?

Dr Paul-Enguerrand Fady: It is for innovative manufacturing: novel technologies; novel processes for manufacturing; more efficient, more automated industry 4.0, which is the integration of AI into manufacturing; and novel modalities of therapeutics such as nucleic acid-based drugs. It is quite cutting-edge stuff, which is great. The other aspect that I was not going to highlight but I will in response to your follow-up is that innovative manufacturing is good but basic

manufacturing is also good. By that, I mean the kind of stuff that we offshored to China in the 1990s.

Keith Ridge: I am glad you highlighted that. One of the risks I could have highlighted is the balance of policy between innovative branded medicines and generics. Generics are 80% of what we dispense in primary care and are used or prescribed in primary care. I would have thought it is of the same order in hospitals. Yet often the focus of attention, policy-wise in medicines, is particularly towards branded innovative medicines, as we have seen in the recent press associated with medicines pricing. I am concerned about that, particularly in this area.

The fund mentioned is part of the pricing arrangement and is open to all. In particular, certain generic medicines—though not very many—get captured for one reason or another in the pricing arrangement. Those medicines are called biosimilars, and they are important. They are complex molecules and treat important diseases such as rheumatoid arthritis, ulcerative colitis and various other things, and are very effective. When on patent, they were very expensive. Off-patent as biosimilars, they are about 80% cheaper than when they were branded. Since that part of the generics industry is contributing, as you will have seen in the press, towards the payment that is associated with the scheme, and given that biosimilars are largely manufactured in the Far East, as we head towards reshoring, why would some of that fund not be used to start to develop manufacturing of biosimilars in this country rather than being reliant on the Far East, complex schemes and a rising problem geopolitically?

Baroness Cass: We will come on to reshoring and nearshoring with Lady Coffey's question. Maybe we could look at the other aspects of prediction and mitigation.

The Chair: First, let me bring in Dr Vann Yaroson.

Dr Emilia Vann Yaroson: Thank you so much. In terms of policies and trying to predict shortages, the good news is that it can be done. The problem is our fragmentation of data. We have different offices doing different things and they do not talk to each other. The MHRA is looking at licensing and security. We have DaSH for manufacturers to report shortages, which is supposed to be mandatory, but they do not do it and it has lagged, so there is no real-time visibility of their manufacturing. NHS England and community pharmacies also have their own data. Everybody has different pockets of data and no one is talking to each other. The inability to use real-time data to predict when a shortage happens is a problem.

We also have issues with all the other things around the world that influence this. According to our research, if a shortage happens abroad, there is a 70% likelihood that that shortage will happen in the UK, just to show you the interconnection between all these things. If we have our data talking to each other, we are able to better predict a shortage.

Another issue is that we do not have a unifying umbrella overlooking this. If we are to have AI models that predict shortages, who is in charge of that? Where is the data coming from? We have the data of GPs' prescribing habits, but we do not know its impact on demand. We cannot see that, so we do not know what is happening there.

Most of the data that comes from the Department of Health and Social Care or from DaSH is just from the manufacturer. We do not have community pharmacies reporting a shortage into that. By the time we are planning our reaction to a shortage, it may already have happened. Sometimes it is reactive instead of proactive. We need a single umbrella that can help with the policies in place. The policies in place are okay, but the main thing is talking to each other, getting all this data with each other and having an umbrella view of how these things interact from abroad and within all the stakeholders.

Q9 **Baroness Cass:** If you were in charge of the policy, would you have a new body responsible for pulling all this together and being a medicines security organisation, or should one of the existing ones take that on?

Dr Emilia Vann Yaroson: I know that the NHS digital supply chain is trying to do that. Everybody uses different infrastructure, so we need to update the infrastructure and bring it together so that we can have a single body, new or old. It just depends on who has better capacity to do that so that we are able to predict better.

Baroness Cass: Slightly heart-sinking in our briefing is that if we have the perfect unified database it becomes a cyber risk, so it is between a rock and a hard place.

Dr Emilia Vann Yaroson: True. Another issue is confidentiality. We should look at confidentiality when we talk about data as well. If we are looking at everybody reporting, some manufacturers may not want to report or expose people. As my colleague said about visibility, "I do not want you to see where I am getting my APIs from or how far they come, so I will just report by email or show you just a part of it". We are not even looking at the patient aspect and we are not even integrating from the community, hospital pharmacy or GP. What aspects of that data are we going to integrate into that? We need to think about all of that as well in terms of confidentiality.

Keith Ridge: I could make a comment further on data if that would be helpful or on how we currently respond. In my view, this is pretty grand, but the drive towards supply-chain digitisation is what we are talking about here, from manufacturer through to patient, essentially. Largely because of what we had to do during the pandemic, we understand where stock is in hospitals if we want to do that, but in primary care we just do not know. Prior to coming out of the European Union, there was something called the falsified medicines directive, which people may be familiar with. Essentially, it is a barcode on a pack that is deployed across Europe where products can be scanned in and out of a supply chain. If you go to a pharmacy in Europe, you will see this happening in real life.

Once we left the European Union, there was a commitment from the previous Administration that a UK version of this would be developed. I have not seen that commitment with the new Administration.

In my view—indeed it was something I was going to suggest to you—there is a case for reintroducing something like the falsified medicines directive across the UK as part of a supply chain digitisation process. If you look at the range of automation and various things that can be deployed in hospitals and elsewhere, the data there could be brought together with data that sits at wholesaler and manufacturer level. That barcode on a pack is probably central to all of it. Therefore, a new form of the falsified medicines directive is important, in my view.

Dr Paul-Enguerrand Fady: The data integration and transparency front is a great segue into some other policies that are and are not working. In New Zealand, Medsafe is the equivalent of the MHRA. Its database has the origin of the API, where it was processed, where it was packaged and who shipped it. All of that is available for free for the public to see very easily as a matter of course, simply by looking up the medicine. We have that data as well in the UK; it is just not made available to the public or anyone else for third-party scrutiny, whether academics or civil society bodies who want to run analysis, or for the Government. That is an oversight and something that could be quite easily fixed. If it is data that we have and that we can integrate, that is easier than collecting the data in the first place.

Similarly, we published a report a few months ago entitled *Growing the UK Bioeconomy*. One thing that my colleague who led on that pointed out was that for people who want to get involved in helping plug gaps within the life sciences supply chain—whether that is start-ups, legacy or innovators—funding is atomised across a huge number of funders, whether it is UK Research and Innovation, Innovate UK, or the Defence and Security Accelerator for people who take more of a national security angle. All these pots of money that are available to innovators are just completely spread out across the entirety of government, with no centralised data platform to say, “Here are all the opportunities available for people who want to get involved in manufacturing to plug gaps in the supply chain”. That is again a fairly low lift but quite helpful in centralising and streamlining access to that data for people who could really make a difference in this space.

It is a cliché at this point to say that data is the key to unlocking a lot of efficiencies, but in this case it is data that we have. It is not a huge ask to say, “Let’s go out and get a ton more data and try to figure out ways to analyse it”. It is just building very basic platforms that enable high visibility and high transparency. The end-to-end manufacturer to patient is of course a lot more complex, but with sufficient political will and effort it is definitely tractable.

Dr Emilia Vann Yaroson: Something to bear in mind, especially when we are talking about medicines security and medicines shortages, is that we need a unified definition among all tiers in the supply chain. If

everybody is reporting a shortage, sometimes the pharmacy's idea of a shortage is a manufacturer's idea of a stockout. For those things, we need to have a unified definition. Last year or two years ago, we had an HRT shortage. The pharmacies saw it coming and were reporting it six months before. However, at NHS level and that of the Department of Health and Social Care, the manufacturers said there was enough to go round. In their view, it was a stockout, but for pharmacies it was a shortage. We need a unifying definition of what actually among all tiers is important if we are to create a database. What I will report as a shortage may be a stockout for them.

Q10 **Baroness Coffey:** There are over 14,000 licensed medicines in this country. The Government recently appointed four Crown representatives to work with suppliers. I am interested in what you said that generics are about 80% of what is dispensed. That is by volume, I assume, rather than monetary value. We have talked about a number of activities. If we were to reshore or nearshore, how would you decide the priorities? What are we actually capable of doing?

Keith Ridge: First, reshoring should be part of the ambition, as difficult as it might be, but it is an important part of the ambition. The critical medicines list could be generated in the UK or we could simply use the same one generated already in the EU. That would then begin to define in order of priority what should be manufactured in this country. I again return to my experience during the pandemic, the critical medicines that were keeping people alive in ITUs that allowed them to be ventilated and so forth, and the global demand that I mentioned earlier. A healthy stockpile of those types of medicines is important, thinking about the geopolitical risk or planning for another pandemic or whatever it might be. There will be half a dozen medicines probably, compared to the 600 or so that are on the EU's list, but I am sure that each of those 600 could be justified. A process by which that list is generated to meet UK clinical practice could then begin to inform priority in terms of which manufacturing was reshored, in my view. Does that help?

Baroness Coffey: Sure. Are there any contributions from Dr Vann Yaroson?

Dr Emilia Vann Yaroson: For reshoring, it is one plug in trying to make the supply chain resilient. It is a good thing. We can look at cold chain. That takes a longer time from the manufacturer to onshore. That is an important point. It is just one plug. We also need to think about the economies of scale. Do we have the key starter material? Do we have all of these things here when we are thinking of reshoring? When we are thinking about nearshoring, we need to think about who we are near and what country we are looking at. In the EU, I know that Germany is looking at Poland to nearshore. Poland is becoming the next powerhouse for pharmaceuticals. The US is looking at Mexico in terms of nearshoring. Who are we going to nearshore if we do not have the capacity?

As I said, there are economies of scale. If we are going to sell as well, who can benefit? It is just one plug to make us resilient, but we need to

think about every other thing. I know that we had a meeting in November where we said how we will start and what critical list we are going to go to. I know Norway had a stakeholder meeting trying to get a list because there are so many. We have 600. We have 800. In my view, things that need shorter supply chains where we can see visibility should be nearshored, like cold chain. Things that you know in two weeks are going to reach their expiry date should be nearshored. Others we can onshore or with others we can think about nearshoring. Getting that exact list of critical medicines, you will see that it will end up going to 2,000 or 3,000 things.

Dr Paul-Enguerrand Fady: I agree with what has been said so far. I add that a key component to this is supply chain mapping and figuring out where there is multiplicity of supply already. Just to take one example, gentamicin is an antibiotic used to treat meningitis and many other things. NHS England did an exercise in, I believe, 2017 to look at its gentamicin supplies and said, "This is an important antibiotic. Where do we get it from?" We have seven formulations available to us at NHS England. There are two manufacturers for those seven. One of them makes five and one of them makes two, and they are both collocated in one city in China. We need to think about multiplicity of supplier across geographies. We have the list of essential medicines and maybe they are also ordered by how rapidly they will expire after manufacture. Where do we currently get them? If it is only from one place, that should perhaps bring it up the priority list. There is a geographical consideration there.

Total reshoring, from every expert I have spoken to, mathematically simply is not possible. We could not reshore absolutely everything that we need. Total autarky for the UK in manufacturing every medicine that would go into the NHS is not possible, nor is it necessarily desirable in a sense, because fragile supply chains are those that are too atomised and hyperlocal. If we were to only ever rely on things that are made in the UK without multiplicity of supply from elsewhere and say, "No, we'll make absolutely everything and we'll only use the medicines we make", that is just as fragile as not making anything. It is about diversification of supply with strategic allies in the region in particular to reduce travel time. That comes through a joint DHSC-DBT-FCDO exercise in international diplomacy to try to co-ordinate industrial strategies across the life sciences.

Baroness Coffey: I was struck earlier, at the beginning of our evidence session, when Dr Vann Yaroson talked about how America had a lot more competition, and then I think Dr Fady talked about the costs of production in the UK as one of the barriers. Just thinking that through, obviously all these things come at a cost or price, balanced against the risk register. It would be useful to understand if we were to make recommendations—we heard about different medicines; the EU could be a starting point—what ultimately will be the rate-determining step and what will be that critical success factor. Currently, the Government have taken a different path. How can we persuade them to perhaps go back to the path that they were on that was trying to address some of this?

Dr Paul-Enguerrand Fady: The rate-determining step comment is very typical of a PhD chemist. We have seen for matters of national and international importance such as the war in Ukraine that there is a coalition of the willing that comes together and commits political and financial capital towards achieving an aim, and that aim is in this case the security of Europe.

Baroness Coffey: As we did on getting a vaccine for Covid, the whole world worked together.

Dr Paul-Enguerrand Fady: For instance. There are examples to draw on that are not within the defence space and that are within the life sciences. Drawing that analogy with the current defence situation, biological security is national security. It is all well and good to defend the homeland through kinetic means, and that is something that the UK has decided that it wants to prioritise. We also have to be open to the idea that we should defend the homeland from biological threats, and those can be natural, accidental or deliberate. We cannot be in a situation where funding is allocated only to defence.

There is a real energy to draw on right now as countries come together in these minilateral organisations that are mission-driven and trying to achieve outcomes to say, "Who are our strategic partners both within the region and within the wider world? Who are our allies and partner nations that are making investments that strategically work for us?"

Austria has invested €150 million in third-generation cephalosporins—antibiotics. It has the last European vertically integrated supply chain. That is great. Let us see how we can procure that from it. It is our friend and ally. What can we build so that when it needs something we are not also building third-generation cephalosporins? France has put €7 million into building a paracetamol factory in the south-west. That is amazing. How can we get paracetamol from France rather than duplicating effort and also building a paracetamol factory in the UK? There is strategic industrial strategy co-ordination to be done across our allies and partners in saying that we can defend the region and we can defend the country from biological threats.

Q11 **Baroness Coffey:** I have one final question. Obviously, the Covid inquiry is still under way. I was doing a bit of research on this. After the inquiry into swine flu, the Government of the day—the blue and yellow one, or perhaps it was Labour that initiated it—decided to stockpile Tamiflu. There was then criticism about stockpiling so much. Where is the balance that you think that we can get to of trying to understand what is really key to stockpiling?

Lord Blencathra: If it is needed, it is good. If it is not, it is wasted.

Baroness Coffey: I was particularly struck by what you said, by the way, about the chemicals keeping the ventilators going.

Keith Ridge: I guess I was around for all of that, as were others such as Liam Donaldson and the like. A public health-type of argument was made

at the time around Tamiflu, and indeed with the antivirals in the most recent pandemic. A case can be made on a public health basis to stockpile medicines like that, and public health professionals will make that case, undoubtedly. In acute medicines, that case is a lot easier, in my view, to ensure that there are essential and critical medicines that you would want to have around at a time when particular issues arise around the world such as the ones that I listed. There will be more. Those are different from a public health measure type of thing. The case can be made for both, and the case for Tamiflu was made at the time, but it comes with risks, as we saw.

The other thing about the medicines that I suggest is that, of course, they could be rotated through the system in the normal way because they are used in normal practice, whereas with Tamiflu it is not really routinely used throughout the year. There is a process by which antivirals are prioritised as the influenza rate gets to a certain level, but one way or another these are not routine medicines, in my view, as compared to the ones that I mentioned.

Q12 Baroness Pidgeon: I have no interests to declare. We were talking earlier about manufacturing APIs. Dr Fady, you explained why it was far more complex. We had evidence from the International Pharmaceutical Excipients Council, talking about 1,200 excipients used in medicines. Is that an area on which we could focus manufacturing to make us resilient, linking with the description and picture that you painted of Austria and other countries and how we could share?

Dr Paul-Enguerrand Fady: It is, but it is a support function. Excipients are the part of the pill that do not make you better. Pills are physically made up of the active pharmaceutical ingredient and the excipient.

Keith Ridge: But you need all of it.

Dr Paul-Enguerrand Fady: You do need all of it.

Baroness Pidgeon: Its letter was quite strong. Maybe this is the bit I had not realised.

Dr Paul-Enguerrand Fady: I am keen to see the evidence once it is published by the committee. That will make very interesting reading. It could certainly be part of this international co-ordinated industrial strategy. If the UK were to decide, as Dr Vann Yaroson said, to turn into the powerhouse of excipients, perhaps that would be an avenue to make attractive deals with foreign nations that are making the active pharmaceutical ingredients. I have to say it is not something that I have considered very closely, but it is interesting.

Baroness Pidgeon: They are a lot easier to manufacture.

Dr Paul-Enguerrand Fady: They also rely on key starting materials that we largely do not make, so we have the same sort of issue. They also rely on heavy industry in a similar way, so I would say, no, they are not much easier than active pharmaceutical ingredients. The UK does a lot of

fill and finish manufacturing, which is the last step. We do not make the active pharmaceutical ingredients, but we will take an excipient made elsewhere and an active pharmaceutical made somewhere else and combine them together into a pill and then sell that pill. The fill and finish step is something that the UK does quite a lot of as opposed to any of the further upstream manufacturing. With a security lens on, people would feel more comfortable in that investment if it was an active pharmaceutical ingredient because, psychologically, it is the part that makes you better.

Baroness Pidgeon: It makes sense.

Q13 **Lord Mott:** I have no interests to declare. We will obviously produce a report that will go to Government. When we get to that final point, what one or two recommendations would you like to see in that report?

Lord Blencathra: I would like a last question after Lord Mott.

The Chair: We will bear that in mind.

Keith Ridge: Do you mind if I run through three or four recommendations as opposed to one or two? First, there is something about leadership. My understanding is that, in the new DHSC structure, the DG for commercial and value will have medicines supply under their remit. That is fine, but because of the growing geopolitical risk here there is something about allocating someone as an SRO and being very clear about who is responsible. Under that, then establish something like a medicines security board with the relevant agencies. That SRO would probably chair it in order to give it the right profile. I mentioned that the Cabinet Office risk documents do not specify the medicines supply chain as a specific risk, and it feels to me that that needs a bit more profile.

I mentioned supply chain digitisation. We have gone through that to some extent already. There should be an ambition around supply chain digitisation. I mentioned that the current Government do not see stockpiling in any form as a mitigation at the moment. No doubt you will question the department. I think they are coming next week. I would question them hard. My advice to you is that the Government should carry out further risk assessment to understand whether some form of stockpiling is in fact now necessary. There should be a range of exercises. Medicines security as such is not really a specific part of the exercise programme. It is incorporated into other things around pandemic planning and so forth. I would call for something a little bit more specific led by the said SRO.

There is a specific issue that we have not touched on around wholesaling. To wholesale medicines, you have to have a licence from the MHRA. There are about 1,600 of those in this country. In France, there are about 16. There is something here about why that is so different and looking carefully at the impact that that level of licences could have on the supply chain.

I mentioned the need to develop a list of critical medicines, and that is important. I wonder also whether you should explore some form of duty of collaboration. I say that because during the pandemic we all worked very well together from within and outside government, and within and outside the NHS, but it was in a spirit of collaboration as opposed to a duty. Such a duty at certain times might be something that you would want to explore.

Then there are those specialist supply chains that I mentioned—aseptics and radiopharmaceuticals. It would be wise for the committee to seek assurance from the Government that the report that Lord Carter chaired under the previous Administration is accepted by the current Government and is supported. My feeling is that the national programme is not running as it could. There needs to be a similar sort of exercise that Lord Carter led to examine carefully the needs and the risks associated with radiopharmaceuticals. That is my little list of three or four.

Dr Paul-Enguerrand Fady: I have four specific recommendations to share. I will try to be quick. The first, as we covered in the previous question, is to really encourage the Government to take on a multi-department friendshoring exercise. I mean “exercise” not in the sense of a tier one exercise, but actually doing it. I am heartened to learn that teams within DHSC are engaged with their international colleagues on this front to try to understand what the landscape is and therefore make strategic decisions. That needs to become something that is owned by multiple departments and is done in concert with real purpose in line with the industrial strategy and to co-ordinate international industrial strategies. That is really key.

Secondly, there is improving data transparency and integration. We have spoken a lot about data today. I really call on the committee to explore all the different ways in which data can be better integrated, whether that is funding for biosecurity actors who want to get involved in manufacturing, manufacturer-to-patient integration, or looking again at whether those barcodes that were opted out of following the EU exit are something that we can bring back. The data question is key.

I just want to leave you with a very quick anecdote that I have stress-tested extensively with a number of stakeholders and I believe it to be true. If we were to consider the smallpox vaccine, which has a range of different use cases, because of the lack of an integrated data platform, there is currently no single person within the UK Government who is able to say, “These are all of our stocks of smallpox vaccine. This is where they are. This is who holds them. This is when they expire. This is where the next lot is. This is the ship that it is on and when it is going to land on UK soil”. That is a problem. Those stocks are held across civilian and military authorities—MoD, Home Office, DHSC, UKHSA and all the relevant NHSs. There is some sub-data integration. The health agencies speak to each other and have quarterly meetings where they exchange information, and that is great, but that is not real time. It is also siloed from defence. It is also siloed from the Home Office, which holds some of

that stuff for counterterror purposes. There needs to be integration. Of course, as Baroness Cass mentioned, the problem becomes that that is a cybersecurity risk. However, the UK Government deal with very serious databases of the names of their intelligence agents, and they are able to safeguard those. There is no reason why this could not be safeguarded in the same way if it were considered a priority.

Then there is the question of stockpiling. I really echo what Dr Ridge said. Again, I am heartened to learn that there is some thinking internally within DHSC about medical countermeasure stockpiles. That is great. We cannot see any of it. As third-party experts, we have absolutely no oversight or scrutiny. Some of that will be for national security clearance reasons, and that is fine. That is completely legitimate. However, there is probably more that the Government should be able to share with third-party experts in the way that the US Government, the Norwegian Government, the German Government and the French Government do. This is not unheard of, and it is something that the committee should encourage the UK Government to do.

The final thing is public procurement policies, which we have not touched on so much today, but they can be used. I know that value-based procurement is being brought into play by the current Government and will have a weighting for continuity of supply. That is a good start. What that will look like specifically and the details will be important, figuring out whether that means multiplicity of supply, how they define continuity and how that interfaces with supply chain resilience specifically. The committee should question officials as they come in about what that is going to look like and then make recommendations based on the answers that you receive.

Dr Emilia Vann Yaroson: Finally, me. My recommendation is just on setting boundaries. I am an operations person and setting boundaries is important. The definition of medicine shortage is very important. My colleagues talked about looking at data and integration. We are just talking about stock. We are not looking at demand. The population is changing, and so demand is changing. GPs have prescribing data and even community pharmacies have prescribing data and the demand. It is important to understand that so that we are able to match demand and supply together if we are going to predict and forecast.

My first part was talking about policy. My recommendations are policy, unified definition and data, but I would also talk about people. Without people, you cannot solve shortages. We need to be able to train our pharmacists and all our stakeholders in how to address shortages. That is important.

Then there is practice. This should not be a one-time thing. It should be a continuous review because demand is changing. The pharmaceutical supply chain is evolving. If we have come up with policies today and we have made recommendations, it should not be a one-time thing; it should be a continuous review of things that happen.

The Chair: That is a good point. Thank you very much for those recommendations. They have been very helpful. A last question from Lord Blencathra.

- Q14 **Lord Blencathra:** Governments have decided that keeping some aspect of steel manufacture in this country is of vital national strategic interest. I was concerned recently to read that our two big pharmaceutical giants, AstraZeneca and GSK, may be downscaling investment in Britain and switching it to the United States. That may be a short-term ploy pandering to Trump's tariffs or creating a manufacturing base there to avoid the tariffs, or it could be part of a longer trend. If it is part of a longer trend, do you share my deep concern that that could signal that Britain is downscaling its investment in pharmaceutical manufacturing? That pulls the rug out from brilliant new start-ups like Moderna and Oxford Nanopore and stuff like that. It is a loaded question. Do you share my bias?

The Chair: I will give you a minute each on this one because it could be a whole new inquiry. Really brief comments are what we are looking for here.

Dr Emilia Vann Yaroson: It is the competitive nature of this. I said at the beginning of the process that the UK economy does not give them a competitive base. It is all about making money. It is all about profit before you think about patient care. A competitive environment is what they will think about. In most of their reports, they talked about that as well. The pricing is not very lucrative. That comes from our pricing strategies—the way we price our products. It is because we are looking for more cost efficiency rather than resilience. It is the balance between those two. We need to find a balance of cost efficiency and resilience.

Keith Ridge: We have already made the argument that long-term resilience requires pharmaceutical manufacture on UK soil. That for me is the key. As to the movements politically by President Trump and elsewhere, that is slightly different, if you see what I mean. It would be a sad day if pharmaceutical manufacture left these shores entirely—of course it would be—but from a medicines security resilience point of view, it seems critical to me that there is sufficient on UK soil.

Dr Paul-Enguerrand Fady: As a researcher at the Centre for Long-Term Resilience, you will no doubt be unsurprised that I agree with Dr Ridge on this. You pointed out steel. The continued provision of steel was specifically chosen and highlighted by the Government as a matter of national security. The same applies for continuity of medical countermeasure manufacture on UK soil.

The Chair: It goes back to that defence point that you made. That has been an excellent session. Thank you so much. There has been a lot of information put over in a really clear way. It has not just been invaluable in its own right; it has been a very good first session to lay the foundations. We are very grateful for both your time and your expertise.

