**The NHS as a digital exemplar: How will technology empower the NHS patients and carers in the future? (Sponsored by TEVA)**

**Future NHS Stage**

**11th September 2017**

**12.00 – 13.00**

**Speakers:**

- Gavin Esler, BBC journalist (Stage Host)
- Chris Smyth, Health Editor, The Times
- Juliet Bauer, Chief Digital Officer, NHS England
- Bruce Greenstein, Chief Technology Officer, US Department of Health and Human Services
- Sophie Castle-Clarke, Fellow in Health Policy, Nuffield Trust
- Jason DeGoes, Senior Vice President of Global Patient Solutions, Teva

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**Gavin:**

Hello, again. Welcome to our 12.00 o'clock session. If anybody from the last session has left a pair of glasses, they're here. This session is about the NHS as a digital exemplar. This is one of the biggest challenges that any organisation can face. Today's cutting-edge technology is yesterday's old kit. Ask any teenager! What is realistic? What is good value for NHS? Chairing this session is Chris Smyth, who is Health Editor with the Times, Sophie Castle-Clark from Nuffield Trust, Bruce Greenstein, Chief Technology Officer from the US Department of Health, and Jason DeGoes from Teva, and Juliet Bauer, Chief Digital Officer, NHS England.

**Chris:**

We look at rising expectations and increasing costs of new medicines, implicit behind them really is the role of technology. If we get it right the power and efficiency and improvement experience you can get from technology can go a long way to addressing all of those challenges.

But I think it is fair to say in the NHS we are a long way off that. Over the weekend, we heard that one in ten of the world's pagers is used in the NHS. Jeremy Hunt always like to point out that we're yet to imitate examples of high street businesses and banks and airlines have persuaded to do all of the work of booking and clerking and managing our own experience ourselves, thus saving them the expense of employing staff do this. We do it gladly because we can do it in our homes and on our sofas during the ad breaks of Great British Bake Off. This is before you get to the profound role of data in managing long-term health conditions and assessing how drugs work in the real world and then again, the possibilities of artificial intelligence in diagnosing disease and whether in ten years every visit to the GP will be accompanied by a robot diagnostic aid.

So, we are going to be told tomorrow by Jeremy Hunt, when he comes, that we don't have to worry because by the end of next year everybody will be able to book an appointment with their GP, manage their prescriptions, through an NHS app by the end of next year, which is great much the sceptics will say this is the same deadline he set for the NHS to be entirely paperless.

To discuss how we will get there, we have a panel here to talk about where we need to go and the obstacles to getting there and how we overcome. Everyone will speak for five minutes and we will open it up to questions. If I could start with Juliet Bauer, who is Chief Digital Officer at NHS England.

**Juliet:**

Thank you for your kind introduction. I did wonder whether you would mention the pagers and you did. A year ago, I stood on this very stage

somewhat daunted by the task ahead for some of the reasons you highlighted. Taking on this challenge to transform the digital NHS, if you like.

I will say this, I won't be able to cover every programme we've done of work in five minutes. I think you will be quite amazed if I did. But I do think in lots of different areas we have actually made really good progress and there is a lot of different new stuff coming in the next 12 months and 24 months that will further demonstrate that point.

How do we think of the challenge we have at the NHS? We put it into five different categories: Administering the patient, the bit I personally work on, supporting clinicians, integrating services, managing the system and creating the future. Five different buckets of work, all of which contain many programmes within them to move us further forward.

In each of those areas we have made significant progress. The pieces that I wanted to highlight today particularly because I'm immensely proud of them is the work that we and the team -- I see some of my team out there today -- have been doing around enabling apps and developers of NHS. We know at the NHS we can't do everything ourselves but the fantastic news is that there is some brilliant people out there that are solving some of the problems we need to solve already.

But what was very clear a year ago when I took on this role is we're making it very difficult for some of those people to operate with the NHS and I actually worked for a start-up Super Carers for a while, and saw it from the other side. It was obvious we could make that easier. We launched the apps library, some of you have seen it. It's in beta. We have 43 apps on there, all of which we're very proud of, getting those through the digital assessment questions, there are 315 of those. What we're trying to say is what does good look like and what we're trying do is set a standard so that people can actually find it much easier to know what good looks like and how to work with the NHS.

We've had over 70,000 users with no marketing whatsoever and we're taking that feedback and moving it forward and iterating it. We are looking at how we get the tools into the workforce so that clinicians can feel comfortable prescribing them. Some amazing work on the apps library. We have launched the digital exemplars earlier. I have spoken to a number of exemplars earlier. It is a hugely positive message about us creating a modern NHS so we're very proud of that work. Also, the digital academy which I'm working on, and how do we train people in the organisations to be really fantastic at digital? So, all of these are different proof points.

We haven't solved everything. We know there are serious things still coming, particularly around infrastructure and around identity that we're still working on, and another whole range of things we will be talking about across Expo. Please go to the digital zones and have a look at that work. And also, how do we create a simpler interface for patients to interact with the digital tools we're doing, which is what the Secretary of State will be talking about. So, lots still to come. But I am really excited to stand up here and at least tell you some of the stuff we have done and hopefully through the questions a little bit of what is coming.

**Chris:**

Thank you very much, Juliet. We will press on to Bruce Greenstein who is Chief Technology Officer of the US Department of Health and Human Services, a long career in managing health systems. He will give us the role of data in the US systems and lessons from that perspective for what the NHS could do better and where it's doing well.

**Bruce:**

Thank you very much. First off, I've been in my role for about three months which is close to how long she's been in her role. Clearly, I don't have advice to give to anyone here. I'm here learning as much as I can. From the

sessions I've seen this morning, it's a little bit reassuring that the problems I hear about on the sessions here are similar to what we have at home and we're all using digital and data in a way to try to address both equality and also the cost and efficiency of our care.

Let me start out with a way to incision and setting the scene for why data is so important and how we expect it to help transform a lot of what we do in the department. Not long ago, we convened a group of state health experts from around the country to talk about the opioid epidemic. One woman from West Virginia talked about a night when 24 people died from overdoses in one day. Is there a way to prevent at least one of those overdoses or 12 or maybe all of them with better predictive analysis and better use the data using what we already had and knew in a very proactive way?

It has stuck with me since I took on this role -- I will talk a little bit about health and human services or HHS, it's more of a confederation. It's the large national healthcare agency. It's about 80,000 people and we spend $1.43 trillion. It is the equivalent in today's exchange rate of £1 trillion. There is a lot of money that goes in. We're not sure if we're getting every bit of value out of it. So, you'll see over the course of the next few years a greater emphasis in our health system of emphasising value over volume. We have been over the last 60 or 70 years a health system that has always paid for the amount of services that get produced or delivered. It clearly hasn't worked as well as it could. Our shift is around quality and outcomes and capitating spending. We think it will go a long way to change the way that care and services get delivered.

In terms of data, we've a new administration, new president, new leadership across the healthcare enterprise. Is there the same commitment for open data and pushing data out to researchers and entrepreneurs? I would say there is an even greater emphasis on open data. We don't view this as a political issue at all. We view it as an economic growth issue, one that helps

promote both the economy, increase in quality of services, and the efficiency for us as an agency to deliver those services. We think about maybe the best model for the US Government has been weather data and GPS data. Whole economies have been spurred once we released Government data in a real-time way and we've watched the use of that data really take off.

For the role of the chief technology officer, we're really concerned about three things. We want to improve Government performance, so we want to be more efficient, we want to fix problems, assure that grants get funded in the right way and get focused on the right issues and not duplicative. We are concerned about policy and we want to make sure that across all information health and technology across this large agency that we reconcile the outcomes and issues between various agencies.

Lastly, data, how do we open up this data? How do we connect it between public health, healthcare, maybe quality? We want to make it available to individuals and entrepreneurs to use. We're also concerned about keeping some of the data closed so not making it publicly available so we're able to maintain the individual descriptors and the personal health information about it to allow our own researchers to do very deep discovery that's never been done before and maybe it will lead to curing of diseases or radically transforming some of the programmes that we operate.

For anybody that's operated in this data domain, creating open data is very easy to say and there's very few people will say that no, no, we don't want to share data. When it comes down to the nuts and bolts of it, you really need to be a champion for it, you need to be a cultural warrior because you have to coax people and agencies to open data where they hadn't been sharing it for the last 30 or 40 years and then the policy around it and privacy and security and the technology that underlies it. What we found is that there is always people that want to do open data and they want to be extremely enthusiastic about it but that's not enough to be compelling. So far what we found in a

short period of time that you need a business case. It needs to be real. It has to have the priorities of the leadership. You need to make it really a business imperative.

We found that in the first issue that we're tackling the opioid epidemic, as we move across public health, healthcare with claims data, transportation, 911 data, poison control hotline, to bring this data together, our goal is to be able to put out data sets that will allow researchers and policy experts to address this problem. At the end of this year, we will have an opioid summit and we will provide the largest data set for the US in our history and allow researchers and entrepreneurs and the policy community to go after it in a codeathon.

Our last piece is our focus on consumers. We interfaced with most of the country in some way for their healthcare. So far, we have done a good job in giving new choices and ways to make data for their health plan choice better, saving people on Medicare over $700. For people who have immunisations, many children, opening up that data and allowing that records to be kept in a longitudinal way to avoid repeat immunisations and make it easier for schools to let people in.

Lastly, the thing we're going to attack over the next several years is around price. How do we make price more transparent so people can make better decisions? Those that have more on their side to pay, now we have high deductible plans with larger co-payments and shopping for the best value is important as we move forward in the future. I'm looking forward to the rest of the discussion.

**Chris:**

Thank you very much, Bruce. I have Sophie Castle-Clark, who has worked on the reports of releasing the benefits of digital healthcare. She will give us the view of the overall views and challenges and goals.

**Sophie:**

Thank you. I'm standing in. So, apologies for the last-minute change to the programme. I thought I'd start by looking back on where we are digitally in the NHS. I realise it's actually really hard to take stock of current progress. We know that almost all GPs have electronic records, but we're still struggling with interoperability and hardly anyone is accessing their own medical record at the moment. It is also really hard to say where hospitals as a whole are in their journey.

So, digitisation across the NHS by 2020 is probably unrealistic and that 2023 is more achievable. There are some hospitals that are much further ahead than others. We have the global exemplars. Some LDRs acknowledge they are behind and they don't have the infrastructure in place at the moment to go forward with digital. It is likely to take those quite a lot of time and quite a lot of resource to get up to speed and it remains to be seen whether they will be able to do that by 2023.

We also saw Jeremy Hunt yesterday in the Sunday Times set out where he hopes we will be by the end of next year. As Chris said, part of that is access to the records and people being able to make online appointments and get online prescriptions which is not as straightforward as it sounds, so giving people online access to their records is one of the best ways to engage patients and enable them to manage their own condition.

But there's also a few problems. People are worried about giving access to third party information, the potential for vulnerable patients to be exploited and the ability of patients to be able to interpret and understand their own records. It isn't insurmountable and some GP practices have given access to records really well. A really good local example here is Horton Dornley Medical Centre which has developed their own questionnaire to give to patients before they gain access to the records so they understand the records. People are booking appointments with the doctor when they could have seen a nurse, for

example, and booking same-day appointments when they don't need them, so it is balancing them with triage processes is not too straightforward, although it is not to say it can't be done.

He outlined potential for online triage, the online 111 service and that does hold a big opportunity to redirect people to more appropriate sources of care. So far online triage has been quite risk averse and it is actually directed people to the healthcare system unnecessarily and lots of that is to do with medico-legal reasons. Some of that still needs to be ironed out. The other thing he highlighted the potential of apps like My COPD. We need to scale up and provide save equivalent apps for every condition. It is tricky to know how we will be able to do that at the moment. It isn't to say there is not lots of good work happening and there are not lots of opportunities.

I recently went to Florida to look at tracking technology in a couple of hospitals there. They use a control centre to see bed occupancy at a quick glance and to be able to allocate beds based on case mix in A&E. It has had positive results. But it is starting to happen here. I think Wolverhampton is ahead in the NHS but there are several other Trusts that will follow in their footsteps in the coming months.

So, looking to the future, it sounds really bland but one of the biggest opportunities is sharing data at the point of care, joining up care and providing a much better kind of joined up experience for patients. Patients are much more likely to become engaged with digital technology as well in the future. If we can put the infrastructure in place to make that happen. A lot of that is around governance, a lot of that is about health coaches and supporting health literacy and supporting patients to be able to manage their condition more effectively.

So, as I said, there is lots of questions that remain about governance of apps and how we can improve them. There are over 40 apps in the NHS digital

library now about there are over 160,000 health apps on the market. So, taking that forward will be a challenge. There are also barriers around the kind of evidence we need generally. What does good evidence look like? Do we need RCTs in every case? How do we actually make sure that the evidence can keep pace with new innovations, particularly new innovations in the consumer market which is moving so quickly? I think we just need to keep moving forward and really making the most of the work that's already started that NHS England and NHS Digital are already doing around this and we are seeing positive results.

**Chris:**

Thank you very much. Jason DeGoes is here to talk about how medicines particularly are used and their use can be improved through technology and data.

**Jason:**

I lead a unit at Teva called unit patient solutions. The goal of the 1,000 people around the world that work in this unit is to help patients be more successful on therapy. I think that's really a shared mission that we have with the NHS, the HHS and many other groups that we're starting to partner with more intently. In that role, I also get to sit on one of our digital evaluation teams that is able to look at different pieces of technology for the company, things that we might be able to use either ourselves in partnership with patients or with groups like the NHS.

I will tell you that there is a lot of cool technology out there, a lot of really cool things to come! If you wander the aisles of the Expo today, you are likely to see a few of them. It is the promise of technology in the future. What excites me is the promise of technology today, the things that exist and are being deployed out there right now. These are the types of things that make the investments we are already making in healthcare, that make the hard work that the people of the NHS do every day more successful. It allows us to

extract more value, as Bruce mentioned, out of the dollars that we're already spending.

So, I went to the NHS testbed session earlier today, got a great overview, not only of the testbed that Teva is involved in, but some of the others in other NHS trusts around the country, and one of the most exciting things to me is the opportunity for technology now to be with the patient and to be with the patient 24 hours a day. That's an opportunity that certainly as a pharmaceutical company we don't have, but it's an opportunity that even healthcare professionals, directors and nurses and pharmacists don't have today.

Through the use of technology, we have the ability not only to impact patients on a real-time basis and on an extended basis but it can make us more successful in our own efforts to support patients and help them support themselves. So, this is an exciting area, I think, for Teva and one of the areas we look at the most now is understanding that we alone cannot be successful in our goals to help patients. We are going to need to work with partnerships.

Our partnership with the NHS is a vital one for us and to me the most exciting thing to look at for the NHS in the future is not just having discussions and dialogues and meetings and reports written. As Juliet said, a lot of that work is coming to through fruition now in the dozens of projects under way.

**Chris:**

If I could start by asking a couple of questions. Bruce, when you look at the vast ecosystem you see within the US and you're looking outside of it, is there a system that is getting it right in terms of how technology is being deployed and we need to work out more? Is everyone scrabbling around to work out what the best way is to do this?

**Bruce:**

I don't think there is a gold standard yet that everybody could live by. What is interesting is the separation between what policy makers think people want and what people really want. It goes from the use of it and privacy. So, one example would be how many people here have access to their personal health record from their provider? Just a handful.

My suspicion is that more people actually have access to it if they go in and set up an account and log in and use it, but of the people that held of their hands, how many people use it more than twice a year? Okay. There is a few. So, what we found is that the people on two ends of the spectrum tend to be heavy users, those with chronic conditions and parents of children with chronic conditions, and using that data to bring across multiple providers is very important. The individual becomes the aggregator of the entire health record.

On the other side of the spectrum is people we called Olympic athletes, those that tend to be more weekend warriors but they're interested in quantifying everything about their own health and bringing it together. The vast amount of people in the middle see it as a bit of a hassle but they want to know if they need it they can get to it.

Flip to the other side, as policy makers, we are concerned about making it difficult to get any health information out of systems and into people's hands because of privacy and security. Furthermore, issues that ought to be linked together maybe behavioural health issues and we make it very, very difficult to join those data together.

When I talk to people on the street and parents and companies and people in hospitals and schools they think we are too concerned and they don't want other people to get their data. That is most important, but they want it easier to get that information. I don't think we have found that true centre point yesterday, that allows us to really understand what the needs and demands

are last point I will make it very promising for the future is the power of API to extract data from large data sets, maybe someone's clinical information in a health system into a useable setting something in a cell phone or an app that could be used online other on a mobile device. That is probably over the next three years where most of the action is going to be. Very vibrant entrepreneurship around that and from the policy perspective we are considering how standards can be achieved so we push it out through all of the Directives in funding that we make and then all of the large, the companies that take care of data for large health systems can subscribe to those standards and we will have that information.

**Chris:**

If I can ask you what you are looking for in those apps and how you see yourself connecting to the wider NHS, computing systems and what is the offer for me as a patient with diabetes what are you saying come here, isn't it great, look at this?

**Juliet:**

What is really important is the apps library and some of the key things coming out of the Five Year Forward View being reflected in the apps library. Where there are particular areas we can make a big difference in terms of better outcomes for patients, better patient experience or managing the system more effectively that we have apps within that area that people with trust and use and we have gone through extensive research, both with patients and the clinicians and the workforce to understand what that means and to make sure we have different tiers of apps, some of which are more light touch so people feel they can come and use them, perhaps it helps them immediately to sleep better or these things and some of which are the more heavy end of the schedule.

Those ones we need more significant evidence to make sure they work, obviously the risks are greater, so we all need to - greater to we all need to

align on how we measure that risk, but that is where the biggest benefit will come. In terms of the promise to the user, over time of course you are going to develop an ecosystem where you will get something very different to what I will get and you will be presented with something very different to what I do and it will tailor to what you need and where you are and the services around you, so more of the connected apps around you, at the moment because it's early days for the ecosystem what you are seeing is the apps some of which at the higher and lower tier, but in the areas where we know we can make a big difference.

I will say one thing, although in England we always think that perhaps we are behind the curve on everything, that is not the case, when we have launched this apps library and a lot of the work we are doing and others in this space, we are not alone, we have a lot of interest from around the world in what we are doing in the space and whether it will work and how it will help us to measure what good looks like and actually a lot of the entrepreneurs you are talking about from the States and silicon valley reach out to us and say which one do you think looks good and who should we be learning about, it's worth reminding us that although we are English we are good at what we do and as some of cases in the NHS Digital is greater than the number of physical interactions.

Eleven million are signed up to Patient Online, they may not use it all the time. Let's not be hard on where it has been done but what we haven't made is it delightful and enjoyable so we overcomplicate user experience and we don't use consistent branding so people get confused and they go to different places and they don't want to use it again, there is a lot we can do and a lot that the Secretary of State will be talking about tomorrow is making it simpler for people to use and that will have an impact.

**Chris:**

How to do that is a good aim. Who has any questions for people on the

panel? Can I see any hands? Surely someone must have some questions? If not, I will ask, Jason, how realistic is this vision of being able to correct real-time data, everyone using the medicine, you can see it's working on you, not on that, we will double your dose and then pay very different rates for everyone, depending on that data?

**Jason:**

First of all, as a pharmaceutical company we have to navigate some of the same data privacy concerns that Bruce mentioned earlier and understanding how to do that, whether or not we can do that directly with patients themselves through a simple consent process, if we are better off engaging with partners who can help us. I think the key is it does have to be easy for the patient, just like not every patient is an Olympic athlete, not every patient is going to know where to go to look for the information, is going to know how to engage with either us or the health system in order to share their data and use the insight that's come back from the analysis of that data, but I think that the promise of being able to make smarter decisions, smarter investments and achieve better outcomes is certainly there.

**Chris:** Can we go to the front there?

**Floor:**

Hi. So how do we, this is all great, digital innovation is amazing but how do we land it? How do I commission it and embed this - as a commissioner embed this into my UAT delivery, how do I make it as part of my STP delivery plans and work with secondary care to ensure seamless care for my patients and how do I physically make this land?

**Bruce:**

I will give an example of two things. One is I mentioned we are using data on health plans to make it easier for individuals to choose the right plan, so think interact, portal, someone is going online to choose their health plan for the

next year, they can enter in information for what drugs they are taking, how many times they expect to see a GP, how often they go to the emergency room etc. Then what gets spit back is an analysis of algorithms and could payables deductibles and they choose a better plan. So that is interacting with the individual.

Here is another example from on a back-end side. Information collected on immunisations, so physicians give immunisations to kids, it gets collected in this big database on a state by state basis. Typically, we leave it there and at the end of the year there is some submission and a year later there is a report so I know really well what is happening in 2015 in Georgia or in Wyoming. Instead we are moving to a system where that is being fed to the health plan in the State or in real-time and somewhere in the middle of the year we start to look at the propensities of people getting their immunisations, by the end of the year you begin the process of emails out, text messages if that doesn't work you go regular mail, phone call. Health plan gets notified and the GP gets notified. So, there is this co-ordinated set of activities around it.

That is waiting to happen more, but to get back to what you were saying there is the promise of challenge for tomorrow and typically you go to conferences like this that everyone is talking about over the next five years and this technology is emerging blah, blah, blah. The reality is we are standing on our data today and we make very little use of it in a really effective way. It's great that I am putting out reports from 2015 data and 2016 data, it's not helping me make decisions today to action on. So that is really, to me the heavy lift is not about Star Wars technology, something that looks in my eyes and tells me what I am going to do over the next five years but rather how do I take the data which is being produced from today's system today, use it in a predictive model or in a proactive value-based model in order to save cost, deliver better care and get the individual more engaged today. So, we are seeing that often, those are two examples we are doing right now.

**Juliet:**

I think the particular nuance on that question is how do we land this correctly in the world as it's organised here, which is not organised around the problems we are trying to solve. I think there is a major risk we re-complicate some of the challenges and the physical experience of health and care online if we are not very careful because of course the problems that we solve aren't pigeonholed into primary, secondary, social care they are real people with real problems who don't care about the difference between those provisions.

One of the things in my last 12 months here I have spent a lot of time trying to do with the help of some brilliant teams but is actually break down those silos and say it doesn't matter, don't even use that language and don't talk about the problem that way because what I care about is that I can. For example, say to my mother next time go online and you will get what you need. It's not going to be a different kind of triage and if you go online you don't want three different types of triage whether it's primary care or secondary care. That doesn't make sense to people.

I think there is a major risk, let's be open and honest. Some of the 2020 stuff was about that. It was breaking that down and getting everyone in the room at CCGs and everyone else let's think with patients from primary and secondary care in the room designing this with us to solve the actual problem, not to look at it from a supply of technology point of view which clearly won't get us where we need to go.

**Floor:** Thank you.

**Chris:**

Do we have any more questions out there in the audience? Gentleman there, anyone else we can take at the same time because we are getting towards the end.

**Floor:**

Thank you very much for the words you have all said. It was very kind of you, especially the gentleman who came from the States, Mr. Bruce. Can you tell us more about how best to go about working, companies to work with, the public sector, one of the key issues we are finding is the bureaucracy and for businesses we just want to focus on creating more shareholder value and the NHS for example is very focussed on giving the best healthcare, so what is the middle ground for those two? For Bruce, if you don't mind me asking what is the best way for UK companies to export their healthcare and take the values of the NHS to the States? Because the systems are different, different, you guys are more insurance-based we are public funded, so if you guys would like to elaborate on that I would be grateful.

**Juliet:**

I mean, obviously there isn't always a disconnect between the best healthcare and shareholder value and in fact many of the people we do work with obviously are in the private sector so that is already happening and what we are trying to do is make that conversation easier, but clearly on the private side you have to be doing something, solving the problem the NHS needs so solve. I hope as taxpayers' people would expect you to have that as one of the caveats of working with people. The really good news is there is a bunch of things going on through AHSNs, through the accelerators which is expediting the conversation. Part of what you are saying is that the language is different, it is different.

When I sat on the other side I couldn't find anyone to have a conversation with that made sense to me when I was on the private sector in a start-up. I thought did that meeting go, I didn't know whether meeting went okay because everyone nodded, now from the other side I can kind of understand how that happens, a lot of the AHSNs, they have their second cohort through, navigators of the NHS, people who sit between and make that conversation make sense and understand what the start-ups in the private sector need but

also understand what the public sector need and talk in a language that is going to resonate when they sit down and have that conversation. Because too many times those conversations happen between those two parties and then afterwards nothing happens and no one is brave enough to say I am not interested in what you are doing, so they continue the conversation and they continue emailing but nothing happens. That is a waste of everyone's time.

We need a navigator, someone who sits between us, we need someone who sits between and has an open honest conversation, if the answer is no, you are not doing something that this hospital or social care needs the answer is no. What I hate is when a conversation goes on for two years and nothing happens.

**Floor:**

I agree, I would say as a company whether has a successful partnership with the NHS today, I don't see shareholder value and patient value as being diametrically opposed you have to find the areas in what the company is trying to achieve and what it can offer as a partnership for a health system match. I think those areas are definitely there. Is bureaucracy a challenge? I am sure it is. I am sure that corporate legal speak is a challenge for the health system as well. If you enter into the partnership, looking to find something that is mutually beneficial I think you will find a willing partner on the other side. For us, the great benefit with our testbed with the NHS is that we know we don't know everything, we entered into this as an experiment to see what works, what doesn't work and to improve it going forward.

**Bruce:**

We are very conscious of this and I think it's a good question. You will probably find that Teva working with the FDA, the Food and Drug Administration in the US gets better and easier over the next several years. We have put out changes in regulation, especially for digital health fewer approvals that need to be made before even your Fitbit app had to be

approved. You had two parts to your question one was how to navigate the bureaucracy and the other to export. Part of my role in this job was to work with the secretary to make it easier for start-up for small companies as well as large companies to work with our department.

I know this from being in the department before but also, I have run parts of large corporations, Microsoft as well as start-up companies. In the private equity world and the start-up world very few of those companies really strain their target on -- train their target on the public sector. That is two things. One it's expensive to hire attorneys and lobbyists and figure out how to penetrate the bureaucracy or you can go in the commercial sector and there is a bit of it more streamlined aspect to it. The way I look at it is my programmes don't get the benefit of the cutting-edge innovation and technology approach, the commercial sector does, they are stuck with those who have it, the large federal sales force.

Part of what we do is we partnership up with companies that have a solid value proposition to make and we help bring them through the process to articulate our priorities and the way it takes to work with the Government, there is no preference and we don't do any part of the procurement, but we want everyone company to have the same access to understanding how it works than large companies do. So, I will give you my card afterwards with my email address and we can look at it that way. In terms of exporting I think there is already quite a bit that happens, whether it's companies that are born and raised on our side of the Atlantic or from here, but I know that Sterner and Epic, Microsoft, I see their booth out there, Apple, Google, Amazon, they all translate across multiple countries. Some very healthcare specific, others, I think you will see a deeper and deeper penetration into the healthcare market, especially Apple, Google and Amazon over time.

So, we view and again yes you guys should take consider than you do when you do something right, I guess if it's the British sensibility, once in a while

take credit for the things you are doing correctly. We pay close attention to what is happening here, particularly on the digital side as proof points and when companies show up and they have a good track record here it means a lot for the way we look at them. I think over time we will see more companies that operate in multiple markets. That experience means more to each of the countries that they work in and again we look at it, while our healthcare systems are vastly different the panel before about social care it's the same problems as we see, it's around cost shifting and the incentives are not aligned and payment policy drives behaviour and that is what we would try to overcome with a variety of innovations on the technology side.

**Chris:**
Do we have a last question before we wrap up? Gentleman in the front there. We will take both at once.

**Floor:**
A question for Juliet please, Mike Cunningham here. What time scales will we see the digital benefits on offer come to fruition?

**Chris:** The lady just there and then we have to wrap it up.

**Floor:** I am Tory digital director of south West London. Could you say three things to our patient population, what are the three things you would say about what we hope would bring in the next two to three years that is meaningful for them.

**Chris:** Good questions to wrap up on.

**Juliet:**
Two nice and easy ones! In terms of the timescales obviously we have talked about some of the timescales in terms of what has been announced this year and what is coming and I do think they are reasonable, in fact some of the

timescales are working on it sitting here, I absolutely think that the, a much better version of what I believe the digital NHS should be is on the near term horizon and I am incredibly excited for that, part of the reason is a lot of the components exist, some of the things are new, of course, with the online one-on-one and the different piece, the trials we have been doing around that and some of the components exist, but need linking together in a more sensible fashion and better at user experience.

So, it's absolutely legitimate to believe that we can and in fact are already a long way towards doing that within the timeframes that have been spoken about. I think that will make a huge difference to the metrics that I care about which is not just how many people have signed up for these things but how many people are using these things and of course the outcome and the effect of them using those things. So, I think the near-term horizon you will see big differences.

In terms of the three things you would say, the three things I would say to patients, first of all I would say to my mum, you can stop emailing me and asking me how you do all of these things with the NHS. It sounds like a small thing, but actually that is the point. You shouldn't have to explain digital to people in the way we still have to in this system because actually it should be much more intuitive than it currently is. If I Google something I should find the thing I want, not a list of 10 things that I don't really understand was the one that I wanted.

So that first point is that one of just a much more intuitive experience and that is very important, but the second point which obviously is much more important is that that group of people, with long-term conditions who really, really need this to stay alive and really need this in order to have just a better life and a better standard of life can get tools that take some of the pressure off everyday life, because it's obvious when you do research that we are making life harder than it needs to be for a group of the population who

actually for whom we could make an enormous difference. So that would probably be the second one.

Then the third promise to patients is that actually health outcomes of course will get better and of course if we can connect all of this data in the way we want to and part of that story is the front end of the experience about making it more seamless but part of that is extra operability, if we can collect that data and analyse that data in a way that patients feel comfortable with because it's anonymous data then we have an enormous opportunity to make a difference to real people and save lives and we all know people who have been affected by some seriously horrible diseases and died from them and I think that is of course the promise is that if you get cancer you will be less likely to die from cancer because of what we are doing here in the digital NHS.

**Chris:**

That was pretty comprehensive, I don't know if there are other promises we should be making to patients. If not, I will end there and say thank you to my speakers.