



Select Committee on the Long-Term Sustainability of the NHS

Corrected oral evidence: The Long-Term Sustainability of the NHS

Tuesday 29 November 2016

11.10 am

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Members present: Lord Patel (Chairman); Baroness Blackstone; Lord Bradley; Bishop of Carlisle; Lord Kakkar; Lord McColl of Dulwich; Lord Lipsey; Baroness Redfern; Lord Ribeiro; Lord Turnberg; Lord Willis of Knaresborough

Evidence Session No. 24

Heard in Public

Questions 236 - 242

Witnesses

I: Dr Ron Zimmern, Chair, PHG Foundation; Professor Keith McNeil, Chief Clinical Information Officer for Health and Social Care and Head, IT, NHS; Andy Williams, Chief Executive, NHS Digital; and Professor Sir John Bell, Regius Professor of Medicine, University of Oxford

Examination of witnesses

Dr Ron Zimmern, Professor Keith McNeil, Andy Williams and Professor Sir John Bell.

Q236 The Chairman: Good morning, gentlemen. Thank you for coming to give us evidence today and helping with our inquiry. Our inquiry is looking at the long-term sustainability of health and social care beyond 2025 to 2030. In that respect, we are interested to find out from you the developments that are likely to impinge on how health and social care may change in the next five to 10 years and beyond, in the short term, in the medium term and in the long term—the developments in science and technology that we can be confident will be delivered in time to be used in clinical settings and in social care settings.

We are on live broadcast, so any conversation you have will be picked up. At the end of the session and in due course, you will get a transcript, as you know. If there are any inaccuracies, please feel free to correct it, but you cannot change it. If there is any material in the discussion that comes up that you are able to send us afterwards that will help us with the evidence, please feel free to do so.

Before we start, could you introduce yourselves from my left—of course, I know most of you. Welcome also, Professor McNeil; I know that you have replaced Dr Sood, and thank you for doing so at the last minute. If anybody wants to make an opening statement, please feel free to do so.

Professor Keith McNeil: I am Professor Keith McNeil. I am currently the chief clinical information officer for health and social care and head of IT for the NHS. It is wonderful to be able to come and speak to you about the potential power and opportunity that we have in getting the IT right, particularly in the data and the information that will flow out of it.

Professor Sir John Bell: I am John Bell. I am the Regius professor of medicine in Oxford, but I am also the chair of the Office for Strategic Co-ordination of Health Research. I have been involved in writing the Accelerated Access Review and I am now leading for the Government the industry group thinking about the industrial strategy for life sciences, all of which I think are material to this discussion.

Andy Williams: My name is Andy Williams. I am the chief executive of NHS Digital, which is responsible for delivering the national technology systems, the data infrastructure for the health and care system and, in the future, the national developments to support the National Information Board, in partnership with Professor McNeil.

Dr Ron Zimmern: I am Ron Zimmern. I am a public health physician and I chair the think tank, the PHG Foundation, which I started in 1997. Basically, our strapline is “Making science work for health”. For the last 19 years, the concentration has been on genomics, but more recently we have widened our brief to include the whole gamut of personalised or precision medicine.

The Chairman: Thank you very much. Do any of you wish to add anything?

Dr Ron Zimmern: I have four small points to make, if I may. First, sustainability is a problem in all health systems, which is to say that the three drivers of the lack of sustainability are demography, the rising expectation of the citizen and technical and scientific advances. Whilst we cannot do much about demography, we firmly believe that dealing with the expectations of the citizen and science and technology will help solve some of the problems which it has created.

The second point is that, although we have people, such as Andy here, talking about IT, and Keith and John, who are very familiar with the biological and genomic, as we observe it there is very little inter-discussion. The guys who discuss digital do it out here and the guys who discuss genomics do it out there. Looked at from the outside, it seems to me that there would be a bit more to be gained if there were more connection. In that context, I prefer the term “personalised medicine” rather than “precision medicine” because it is not sufficient just to deal with the biological and the biological risk; we have to put the patient or the citizen at the centre of the new healthcare system.

The final thing, and probably the most important, is that, sitting where we are, looking at the whole health system, we firmly believe that muddling through is not enough and that, if we are to get the benefits from the science and technology, we have to redesign a new health system that puts the patient at the centre.

The Chairman: Does anybody else want to make an opening statement?

Andy Williams: I would just say one thing, if I may—and perhaps, Ron, to your delight—we are working very closely with Genomics England.

Dr Ron Zimmern: Yes, that you are.

Andy Williams: Sir John Chisholm, who heads up Genomics England, is a member of the NHS Digital board, and we are working very closely with them to work out how the data, in particular, can be worked together over the coming years.

Q237 **The Chairman:** That leads me on to the first question, which is: what technologies which are now in the process of development are likely to be embedded into health and social care—and presumably it is more healthcare—by 2025 to 2030, and what effect will that have on the sustainability of the health service?

Andy Williams: There is a wide range of technologies. I will confine myself to information technology and data, which is not all-encompassing, and some of my colleagues can perhaps comment on some of the wider things. I think there are three main areas where information technology and data will come together.

The first is to help on this point of personalisation. I think we can do much more, as far as the patient is concerned, by better use of digital technologies to allow patients to understand more, to access their health records and increasingly to use intelligent systems to allow them to look at self-diagnosis—so, one big trend.

The Chairman: Give me a real example so that we and the public can understand what you are talking about. How do you use digital technology to self-diagnose?

Andy Williams: Two examples would be that in the short term I think we can make relatively straightforward transactions, if I can use that phrase, with the healthcare system, so ordering a repeat prescription or booking an appointment can be done very effectively using digital technology.

In the future, as patients start to have access to their health records and so-called “artificial intelligence” can be used to understand what is wrong with them and to compare their health record to the health records of the broader population, they can come up with smart diagnoses to help the patient understand what they should do next, and it could be to go to A&E or it might not be. So those are the sorts of things from the patient’s point of view. With apps and wearables, I think in the next five to 10 years we will see a revolution in the way devices will be monitoring people, and using technology to take the data that comes from that is another big advantage as far as the patient is concerned, so that will be the first thing.

The second is that we can use technology better to create more efficiencies in the way the system works, through interchange and passing information around, so if the age-old problem arises where you turn up at hospital and the information about you is not there, we can get information flowing much more effectively. Within hospitals, technology systems can not only improve quality but can increase efficiency and effectiveness.

The third area is a much better use of data generally. Before I say anything about that, it is worth saying that we have to be very conscious of the public’s understanding of the use of data and the need to have the public’s trust in how their data or data about them is used. If we can do that, data can be used in all sorts of ways in the future: to understand how effective the system is; to develop new treatments and new drug treatments more effectively; and linking genomics data to phenomics data. The whole world of data is the third area. That is the path that every industry other than healthcare has been on for many years and that is what we have to do in healthcare.

Professor Sir John Bell: If you are trying to think about that problem, you have to look back, as it were, at the natural history of new innovations in healthcare. Most of them start in the physical sciences more than 20 years before they are applied at scale. Digital would be a good example of that. From the time people start waving their arms

around about it being a revolution in healthcare, you could start a stopwatch and it would be 20 years until you got to the point where it was of any use to anybody. There is a long gestation period for most innovations, but I think there is an opportunity to think about what those innovations might look like 20 years from now, for example. As part of the life sciences industrial strategy discussions with industry, we have been talking about what they perceive the world might look like, which is an interesting view, and many of those things overlap with what Andy has described.

There is a wide view that digitisation and large sets of data will lead to quite a lot of artificial intelligence applications across medicine. We are starting to see a few of those now, but the AI revolution—particularly in places, such as MIT, Caltech and Stanford—around robotics and intelligent use of data to draw conclusions out of a rather noisy set of data as to what is going to happen to people is a huge play. The UK is not very good at it, to be honest, but we could get better in the health space.

Implantable nano-sensing devices will almost certainly be there—things floating around in all of us that will be radioing out to say, “Keep an eye out for that”. That, I think, is inevitable and will add to this personalisation component because, of course, those signals will have to be interpreted on an individual basis.

The other area which is extremely interesting is that if you look at the natural history of all the chronic diseases—cancer, cardiovascular disease, diabetes, heart failure—all the things that are causing such a huge problem in the healthcare system, we diagnose them in the last few years and then we prop people up and therapeutics are entirely symptomatic. What we know in all those settings is that early diagnosis of those diseases completely changes the way you manage them and completely changes the outcomes. With cancer, for example, we have a lot of very expensive drugs which we give to people at the very end stage of their cancer, they get an extra three months alive, which is all fine, but the truth is we know that if you diagnose cancer really early, you can often, in fact usually, cure it. I think there needs to be quite a lot of attention paid, and there are now technologies which will allow us to analyse for very early malignant disease based on circulating tumour DNA, which should allow us to identify people who have very early tumours, maybe even before they would appear on a scan, and allow us either to track them or to excise those tumours at a very early stage. That frontloads the costs, but it saves you a lot of trouble downstream because the expensive bit is propping people up at a late stage of life. The same is true with diabetes, hypertension and cardiovascular disease.

Prediction and early diagnosis is going to be, I think, the new world of healthcare 20 years from now. Interestingly, the NHS is about the best place in the world to apply that at scale, but the problem is they keep talking about it and not doing anything about it. We cannot just keep saying, “It is going to be a public health-generated healthcare system”,

but we have to say, "Okay, but what exactly are we going to do to get it to where it needs to get to?" That is my view.

The Chairman: So most of the technologies over the next 20 years that we now use—and you are right, the gestation period is long—end up delivering maybe more efficiency and better outcomes, but increase the cost?

Professor Sir John Bell: I disagree with that. I think the fundamental problem with innovation in healthcare is that we do not systematically look for the ways that innovation can extract cost from healthcare systems. In fact, the definition of "innovation" should be to improve outcomes and to save costs, and it saves costs by changing pathways, allowing you to re-profile the workforce, which is essentially where healthcare systems spend all their money, and you should be able to extract very large amounts of money out of the system using those tools.

The problem is that the healthcare system is really bad at doing that; they layer innovation on innovation and they do not say, "Okay, this is an innovation, but it saves money because we can shut those beds over there and reduce the staff in this area of the hospital" and save money in those domains. My view is that innovation should be seen systematically through the lens of how they save money and that data needs to be robustly generated by these guys, who will have the digital data to show it is true, and that is how innovation needs to be implemented. We describe that a bit in the AAR report, but it does need real focus. Therefore, I disagree with that premise. Innovation that just raises costs is going to be unaffordable by everybody.

Dr Ron Zimmern: I would like to add that innovation can save costs, but not if it is added on as an extra layer to the system that we have today. We have to have a new bottom-up-based system where care starts at a much earlier stage with the healthy individual.

The Chairman: That system does not exist just now? Is that what you are saying?

Dr Ron Zimmern: It does not exist. I would only agree with John, I think, if we were talking about a much more disruptive sort of situation. By layering technology on to the existing system, it could increase costs, but, if we do it in the right way it will save costs. It has got to be done in the right way.

Professor Keith McNeil: Following on John's point, to give you a practical example of innovation and costs, when coronary angioplasty came in, which is putting a balloon in a coronary artery to treat a heart attack or a blockage, the previous treatment would be to open someone's sternum and do an operation. The cost of doing an angiogram is much less than doing an operation, but the angiogram enables that technology to be available to a much wider population, so you get the balance between an individual procedure which is less costly and innovative but is

available across a wider population and, in fact, the aggregate cost is greater.

I think of technology in two ways. There is technology that enables us to interact with the patient more effectively, say, to do an operation with a robot or a laparoscopic device. Then there is technology that enables us to gather information, such as an MRI machine or a CT scanner, which effectively gives us information. As we have alluded to, the power of what we can do now—or we are starting to be able to do with aggregating that information—is to feed that information back to the individual clinician-patient interaction to make that more effective. There are a million of those every 36 hours across the NHS and if we can make each and every one of them more efficient, effective and more productive, that will start to embed sustainability. We feed it through for business intelligence so that we can run systems more efficiently and productively, which is the whole business intelligence tool, and we feed it through to research so that we can prosecute the issues around genomics and phenomics and how we bring that back into personalised and precision medicine. That is the platform we have set out with the National Information Board portfolio and that is exactly what that portfolio is aiming to do: to enable us to gather information and make it available to people when they need it and in the form they need it as a real-time technology.

Bishop of Carlisle: I do not need to ask my question now because you have just answered it; it was about costs.

Lord Turnberg: Is the problem the timing: that the cost of an innovation is quite high when it gets put in, but the savings are downstream? The savings are not necessarily made to the health service but they are made to the productivity of the country and the Treasury, and the Treasury does not recognise that the NHS is providing it with some extra money. So how do you get that right?

Professor Keith McNeil: That is a really good point. Even within a hospital, for instance, in the way we cut the budgets, often where you will spend money is not necessarily where you will gain the reward. Right across the system—from the very bottom to the very top, if you like—it is difficult to figure out how you follow the paths where you get those productivity efficiencies and cash-releasing savings.

It is not outwith our capacity to be able to do that. In fact, particularly with the digital stuff we are doing, it is important that we consider innovative ways of looking at the return on investment. We have to do that to know where we can most usefully invest, because it is expensive, but there are great gains to be made, as you say, for UK plc in a lot of areas around data.

Professor Sir John Bell: It raises the interesting point that, first, introducing innovation always causes an uptake in the cost because you have to change the pathways in order to make the savings, which always means you have to change some things, so there is always a real increase, sometimes modest, in what it costs to get things to happen.

I think the problem is further upstream because what we are not very good at is understanding where you extract the savings before you introduce innovations. You can only do that in a closed system because it is not helpful for a hospital to think that it is saving money for the costs to be dumped on the primary care docs or vice versa. Therefore, unless you understand the integrated pathways as to how making an innovation changes things in cost terms and how you can change pathways where you capture the savings across the whole system, you do not really have an innovation. We are not very good at doing that.

The advantage of the digital agenda is that you will be able to capture data on the same patient in primary, secondary and social care, and you will be able to know the captured cost of that whole pathway and then manage that to try to get yourself in a better position in terms of cost reduction.

Q238 Lord Kakkar: I would like to explore the question of whether you can provide evidence that adopting an innovation or technology has provided improved efficiency in the measurements that Sir John was talking about—understanding the tick up not at the initial introduction of that innovation but downstream, that that innovation has provided efficiency and financial gain in the delivery of healthcare. I should declare my interest as the chairman of UCL Partners, which hosts the national Innovation Accelerator. What systems and processes exist to take these innovations and embed them at scale across the NHS at the moment?

Andy Williams: With all the data and technology systems that we run nationally within NHS Digital, we measure the costs and the benefits. A lot of that data has been provided to certainly the PAC once a year, but there are some good examples of national technology systems that are producing very significant benefits versus their costs. There is a national e-referral system, which used to be called “Choose and Book”, where the benefits of electronic referrals across the system are massively higher than the costs of running that system.

Lord Kakkar: By what proportions?

Andy Williams: In the case of the e-referral system, I would have to provide the data, but it is multiples—perhaps 7:1, 8:1, 9:1—of benefits versus cost. If I could sidetrack just for a moment, the evidence across all industries, not just healthcare, in what is now called “digital technologies” is that, generally speaking, a well-implemented digital system produces annual savings of between one and two times the cost. The issue that we were getting to in some of the previous discussion was that those come, typically, one to three years down the line. In healthcare, one of the difficulties we have had in technology systems is the speed of take-up. Only 50% of all first referrals across England currently go through the ERS system, so it is producing big benefits, but its uptake is not as high as it could be. With the EPS system—repeat prescriptions—you can order those online and have them delivered to a chemist or a pharmacy of your choice and go and pick them up. That

produces significant benefits above its costs, and there are other examples of national systems which do produce significant benefits.

The Chairman: What you have described about prescriptions happens now, does it not?

Andy Williams: Yes, it is the system that exists today.

Professor Sir John Bell: It is not just digital. In fact, we are at the beginning of a digital revolution, so I would not expect a catalogue of examples where it is saving a ton of money because it is not yet, but, if you look historically, the list is very long. We do not do duodenal ulcers anymore. In 1990, 50% of all hip and joint replacements were due to inflammatory arthritis and last year it was 0.5%, so, even in absolute terms, there are dramatic savings. With the use of antipsychotics, which allowed us to close all the asylums around the country, there are huge savings if you add them up over time and, of course, those drugs are all generic now, so they cost very little and have a huge impact. In stroke care, which is an integrated set of innovations, integrated, highly effective stroke care saves a ton of money in the healthcare system. It is not just one but multiple things that get done in that pathway, and London is probably the best example of that nationally.

There is a list of really spectacular savings from innovation, but it is quite hard to predict at the beginning which ones are going to give you a really big hit. When the anti-TNFs were introduced 20 years ago, I remember the debate with people saying, "They are really expensive" and, in fact, they did get embedded and they cost the system quite a lot of money, but, if you look at the numbers they are terrific. Most hospitals do not have wards anymore for rheumatoid patients because you do not need them, and all the surgery has gone because you do not need surgery for hands that used to look like that. There are a lot of savings in a lot of domains that are not digital which I think are very real.

Lord Kakkar: Do you think we have a system that allows the adoption of this innovation at scale in such a way that we can quickly realise the financial benefits to drive long-term sustainability? If we do not, what needs to be put in place in the adoption of, let us say, disruptive innovations which, by definition, will attend some local controversy in terms of the disruption created?

Dr Ron Zimmern: It is absolutely true and, although innovation is necessary, it is not sufficient. There are huge barriers at the moment to diffusion—although we should not use that word because it is passive and, if you allow it to be passive, it will not happen. Change management is the thing. If we are going to have disruptive change, we have to change champions. There are issues about both having and developing clinical champions, clinical leadership, managerial champions and managerial leadership for change management. It will not happen by itself. It is an explicit activity.

Indeed, in dealing with this, the other thing—and we are doing a lot of it now but nowhere near enough—is to use citizen power. In patient groups in the whole rare diseases environment, a lot of this is being driven by the patients. Those are the active things.

In addition, we have to get rid of certain things that are barriers. I do not believe that our regulation is proportionate enough in many areas. We need to break down barriers, particularly between clinical and research, where the governance mechanisms are at the moment different, but clinical and research are coming together. Indeed, there are barriers between clinical and public health because, to get the big data revolution going, it is dealing with huge populations of data and that is where we need a public health input. But at the moment most of my public health colleagues have no interest and no expertise in some of these areas, so there is a huge divide between clinical and public health.

Finally, another barrier is the realisation that politicians' timescales are short term. Here we are talking about a 10 or 15-year strategic change management programme, which I firmly believe—unless we act—will not happen.

The Chairman: John, you were shaking your head when Lord Kakkar asked the question.

Professor Sir John Bell: I agree that one of our biggest limitations is a system-wide approach to try to take advantage of innovation in extracting money from the system. We tend to allow innovations to go in and for local healthcare economies to cook up how they are going to use them, and there is no systematic approach to how to change pathways. The two ways to save money in healthcare systems are to completely alter the way a patient flows through a pathway and to re-profile the workforce. I am sorry to say the workforce in the healthcare system is hugely, in a sense, unionised; they are deeply conservative; they do not want to change what they do; they are dug in.

The Chairman: You have brought a smile to Lord Willis's face.

Professor Sir John Bell: Sorry, I did not anticipate that. Those are real obstacles and, unless we are prepared to bite the bullet on those things, we will never extract the savings.

Lord Kakkar: So how do you think we should bite that bullet, because that comes down to the core question for this inquiry? How is that going to happen?

Professor Sir John Bell: One of the things we recommend in the AAR, which is important, is that you should not introduce these innovations unless you have a clear view about how you will change the pathway and the workforce in the way that you apply these in real life. Very often, we will say, "That's a nifty gizmo. Let's see if we can use that", and what it really needs is some rather more systematic work in a closed system supported with digital data, so that you know what the benefits are.

Then, as we suggested, NICE takes the role of saying, "This is not just cost-effective but it's cost-effective if you do the following things to save money". This is an anecdote, but rather interesting. Twenty years ago we introduced PACS systems for X-rays. We went digital on X-rays and the view was, "Well, you have a lot of ladies in white coats in the basement putting X-rays in folders and sticking them on shelves and the X-rays always get lost, we cannot get them and it is hugely costly", and those of you who have done a bit of clinical medicine will understand what I say.

The Chairman: Yes, every day of the week.

Professor Sir John Bell: It was kind of obvious to do the digital thing, so they did the digital thing. There was a graduate student in my place who did some rather interesting analysis as to what happened and it turned out that the cost of maintaining the digital system was exactly the same as having the little ladies in the basement, so you were now cost-neutral. All the savings came from the efficiency of the radiologists who could flick through 10, 20 or 30 X-rays from individual patients or multiple patients much faster, so their efficiency hugely improved. In America, where they introduced the same system, they fired a lot of radiologists. In the UK, everybody just drank more tea and ate doughnuts. That is the problem and that is what you have to fix.

Lord Kakkar: Do you think that, as currently constituted, we have the flexibility in the system to be able to address those two critical issues: the definition of clarity with regard to pathways of care, and the modification of the workforce to allow us to take advantage of innovation that we might introduce? Where is the impediment in both those areas?

Professor Sir John Bell: The impediment in the pathways is that the structure of the healthcare system at the moment is multiple balkanised states, even at a local level, all of which carry a yellow card and can stop you from doing almost anything. If you have a good idea that changes the pathway that runs right through the system, there are all kinds of people who say, "Sorry, we are not doing that", so there is no command and control to make things happen. That is the pathway thing.

On the people thing, it is this heavily—"unionised" is probably the wrong word—consolidated view of healthcare workers who form groups and tribes within a healthcare system where they defend each other, defend their space, and they do not want to change. Worse than that, we train people to be highly focused on doing one thing and if we want them to be doing something else later in their careers, they will fight for their lives to stay doing what they were doing, even though we all know it is not cost-effective, so it is a real issue.

The Chairman: Including doctors.

Professor Sir John Bell: Including doctors, or doctors more than anything.

Lord Willis of Knaresborough: Consultants are worse, Chairman.

The Chairman: You are speaking to one or two there.

Q239 **Baroness Redfern:** Following on from that questioning from Lord Kakkar, I know it has been mentioned that speed is an issue on the take-up of new technology and is a barrier to innovation, but how can we incentivise a greater take-up of those technologies and innovations, and who monitors progress nationally on that?

Andy Williams: My answer to that comes back to the discussion we had a moment ago. I have been doing this job for about two and a half years and previously I had spent time implementing technology in all sorts of other industries, so I have spent a lot of time reflecting on why things are different in healthcare compared to some of the industries I have worked in. Part of the reason I say that is that you can always find across the health and care system in this country examples of really good, innovative uses of technology, but they do not spread at anything like the rate you would expect them to. Why is that? I would point to two things, and one of them we have talked about. Quite often, in large, complex organisations, the benefits of something sit in a different part of the system from where the costs lie.

Baroness Redfern: It is about the silo mentality?

Andy Williams: Yes, this sort of silo, I think, is one of the inhibitors. Another one is a technology inhibitor. Without going into too much of the detail, new technologies quite often get plugged into the existing technology of one of those organisations and it is unique to that, and trying to replicate it somewhere else requires an awful lot of planning, so it is hard and difficult; it is not simple just to take something from here and put it over there. From a technology point of view, over the next few years we have to make that much simpler. Despite the organisational constraints and the costs and benefits lying in different places, we ought to be able to do much more so that, if technology innovations exist over here, you can make them work over there and it is much easier. That is a big task, I think, over the next few years.

Baroness Redfern: Do you think that will happen in the next five years?

Andy Williams: I think we can make big strides in that.

Baroness Redfern: In five years?

Andy Williams: In the next five years, yes. That is one of the aims.

Professor Keith McNeil: Following on from your point, one of the issues about anybody adopting innovations is headspace to do it, both in terms of funding—because it is always expensive, as John said, before you start to see the benefits and, unless you can access a fund or something, the trusts, hospitals and providers do not have the funding to invest to save—and the time involved. To put most of these things in, it needs to be done properly and usually it is added on to what you are doing already, as you assess the impact, and it takes a lot of time and effort for people, which is quite often discretionary, and there is no headspace on

the ground to do that. I can tell you, from having implemented an electronic health record in Cambridge, that it is unbelievably disruptive, and we all know we have to do it. We had to do that with virtually no headspace at all, added on to what we were doing already, and that is spreading. That adoption of technology is really hard because you are so focused on just getting through day to day and dealing with the demands. I do not know what the answer to that is. I think some of the digital things that we can do, providing there is persuasive evidence that you need to do this and to have the system invest in doing this, will be really important. Having the space for people to do it in real time is a problem.

Lord Willis of Knaresborough: All the questions and answers have been, for justifiable reasons, about tertiary care, intensive care and serious long-term care. My concern, and this Committee's concern, is that the issue of social care impacting on health budgets is absolutely massive. Can you give us any indication at all of where there is going to be a technological or digital revolution to deal with the intense monitoring of long-term care in order to save the sums of money that are needed to make the system sustainable?

Andy Williams: It sometimes comes across as being a tertiary care focused conversation, but everything that certainly Keith and I are talking about applies also to social care. The remit of my organisation is health and social care, not health only. Much of the patient revolution from a technology point of view, and the shift towards prevention rather than cure as part of that, also applies to social care. When I talk about stitching things together much more effectively using technology, that includes social care. When we are talking about information flowing around the system, that has to include social care. I do not know whether that answers your question.

Lord Willis of Knaresborough: Not really, because I spend a part of every week in social care settings and the use of technology is virtually non-existent in monitoring quite vulnerable patients, particularly those in domiciliary settings. If you go to McLaren Technology, which has offered the most wonderful sensing systems to use to monitor those patients, they can monitor their Formula 1 car out in Abu Dhabi, but elderly patients in the North Yorkshire moors cannot get that sort of simple technology. I find that really quite disturbing when we are looking ahead to 10 or 15 years' time.

Professor Sir John Bell: The point is a good one, but those systems are actively under development. You can, off the webcam of a PC, measure pulse, respiratory rate, temperature and, believe it or not, oxygen saturations in a patient. You can track virtually everything that is going on with webcams and monitor people at home and probably get somebody to them if there is a problem as fast as you can get a house officer to level seven in their local hospital. I think the opportunity, say, to manage people who are having acute episodes in their chronic illness and track their mobility—are they going to the shops or are they

spending all their time sitting in a room immobile?— should be relatively easy to do with digital sensing technologies. There is a project near my place which is doing exactly that to try to increase the effectiveness in functionality of domiciliary care. At the moment, people do not use it because they are worried that bad things will happen when they are at home and they will not get healthcare. The truth is that bad things happen in hospitals too and, in many ways, if you can get that set up, it would be a better place for patients.

Lord Kakkar: Do you think that the STPs, the 44 or so which have now been described, are more or less likely to overcome the two impediments—the pathways of care change and the workforce change—to allow innovation adoption at scale?

Professor Keith McNeil: Yes, I think they are more likely. The STPs, particularly working across with constructs, such as academic health science networks, will be able to spread that technology and innovation much more effectively. The short answer is yes, they should absolutely help in this space.

Professor Sir John Bell: Conceptually, it is a good idea, but the execution is poor, in my view.

Dr Ron Zimmern: There is one other thing, which relates to the last two questions on clinical pathways and the workforce—I totally agree that it is essential to get those changed—which is the citizen or the patient. We see in the rare diseases sphere and in whole other spheres that public engagement is seen to be absolutely key. It seems to me that, if we are to have this transformation, we have to take the patient or the citizen with us and put them at the centre of the healthcare system. Because of all the political forces and so on, there is much more likelihood of that if we have the patient or citizen behind us. Also, the perspective of the patient or the citizen takes us to an earlier point of using these technologies—to keep the patient healthy before they have even had the need to engage with primary care, let alone secondary and tertiary care. With clinical pathways and workforce change, putting the citizen at the centre is an essential part of everything.

Q240 **Lord Ribeiro:** The Health and Social Care (Safety and Quality) Act 2015 provided a legal framework to share data. I have heard both Andy Williams and Ron Zimmern talk about patients and patient trust and, in fact, we know that, because of a lack of patient trust, the care.data system failed. Realising that this Committee is about the long term, how will we make sure that we use the data effectively to create a sustainable NHS in the future—and that clearly means starting with the patient?

Andy Williams: This is one of the crucial challenges. A lot of people talk about there being a balance between the patient's trust on the one hand and the use of data on the other. In that sense, it feels like it is an either/or where you do a bit more of one and less of the other. I do not think that is the case at all, but you can do both effectively, which we have to. Dame Fiona Caldicott wrote quite a long and important report on

this recently, in my view at least, that is currently beyond consultation and there has been wide consultation. The Department of Health is currently ruminating on that consultation, and I do not want to in any way prejudge what they may or may not say, but the recommendations that Dame Fiona came up with and what we do about them are really important. You are right that care.data, in part, failed through a lack of public trust in the use of the data that was going to be generated. When we are thinking about the benefits of data in the future, which are enormous, we have to bring the public with us and this comes down to the public having to trust that we are handling their data with care and respecting whether they agree with the use of their data. We have to convince the public that we are doing the right thing and involving them and asking them.

Lord Ribeiro: This is a challenge because, in fact, the Caldicott principle is about the ability to share information being almost as important as the ability to care for the patient. Inevitably, we try to do things top-down. What you are describing is a situation where patients may, in the future, have implantable instruments put inside them which will monitor what they are doing, but they will not allow you to do that unless they trust you and what you are doing. How will we take that mechanism forward?

Andy Williams: We have to allow patients the option to tell us whether they are happy or not for their data to be used, particularly for secondary care and what is called the "secondary use of data", and Dame Fiona's report talked quite a lot about that. We have to convince the public that, when it comes to the use of their data, the NHS brand is as trustworthy as it is in general. We have some work to do on that. I think it is possible to do it, we have to do it and that gives us the right then to use the data in the ways that we talked about earlier, to the benefit of the patient. That is the crucial thing: nobody wants to use the data in any way other than for the benefit of the patient.

Professor Keith McNeil: It is absolutely critical. This agenda will not go forward without the effective sharing of information, and that relies on citizens and patients being confident that we do what we say we will do, so it is pushing forward the imperative and making sure that people understand that. Secondly, it is about having robust security, data guardianship and information governance systems, having transparency in how that data is used, giving people options as to how their data is used and doing it in an open and transparent way.

The Chairman: Do you think that currently, there are mechanisms in place to communicate this information to citizens?

Professor Keith McNeil: Not as widely as we would like, but they are being put in place.

The Chairman: How will that happen then?

Professor Keith McNeil: When we have the response to the Caldicott review and the whole system comes to a view as to what to recommend,

there will be a media campaign, for want of a better term, to explain what has happened, why and what we will do moving forward in terms of how this will all play out.

Professor Sir John Bell: There is an important point here, which is that engagement is unlikely to be done by Government Ministers. It is very likely to be done at a local, not a national level. If you get a letter from these guys—who are terrific, I have to say; NHS Digital are terrific—saying how they are going to use your data for X, Y and Z, you will flip. If somebody in the local GP surgery or the local hospital says, “We are going to try to get a system where you can look at your records. Will that be okay with you?” you are likely to say, “Yes, that is kind of interesting”. If they say, “We would also like a system whereby the hospital consultant can see the GP records and the GP can see the hospital records”, if the patient knows the GP and they know the hospital, they will say, “Well, I thought you did that already”, which we do not, and then they will say, “Well, of course you can do that because then, when I go to see the consultant, he will know what the GP said and vice versa”. If you can build their confidence at a local level, it becomes much easier to make those things associate with each other and you then end up with very powerful master databases, but it is all done with consent on things that will benefit the patient. If this does not benefit patients, it is going nowhere.

Q241 **Baroness Blackstone:** Last year, the National Advisory Group on Health Information Technology was set up to advise the Department of Health on secondary care digitisation. Which of its recommendations do you think we should be focused on, and how far have they been implemented so far?

Professor Keith McNeil: Are you referring to the Wachter review?

Baroness Blackstone: Yes.

Professor Keith McNeil: As you know, there were 10 recommendations and they were all widely accepted. That report, when considered in its whole, both complements and informs the national information strategy, so there is a nice piece of synergy there. To my mind, the important thing to take away from that is that the report encompassed expectations—what you can expect from digital maturity and from having to go through the journey to achieve it, which was important because it is a difficult journey in some instances. The second thing was interoperability and how the systems should come together to enable effective data flows so that information can be available where and when it is needed. The third critical thing from my point of view is the absolutely vital need to engage clinicians in the whole gamut of what we are doing in this space, because they will be the end users with the patients and citizens. The report in its entirety is important, but those, to me, are the three things we take away.

Andy Williams: Can I just add one thing to that, if I may? There is another recommendation in there which applies to a lot of what we have

talked about, which is the importance of leadership around the use of technology and data. If we are to get much more effective use or uptake of these technologies in the future, working with leaders across the health and care system locally and nationally to understand, by doing this set of things, how your organisation can change to effectively take advantage of this, and how it helps patients and clinicians, is really important. It was one of the recommendations of the Wachter review to focus on the leadership community across the health and care system.

Professor Keith McNeil: There were two pieces on leadership. One was around upskilling the clinical workforce and not just in digital capability but in thought leadership and actual leadership in leading transformational change underpinned by technology, which is important. The other leadership piece was around the exemplar programme, which was picking hospitals that are already showing investment and maturity in this instance, and getting them to a high level so that they can act as system leaders right across the country to pull the rest of the system up to that level.

Dr Ron Zimmern: Can I add technology to this, if I may? It is not something I know a lot about, but some of my colleagues are telling me that, since we have this tension between the patient wanting data protection and the clinical and scientific community wanting the sharing of data, blockchain technology may be one way to go—it is almost a network because no one is dominant and everybody plays a part in it. I do not know whether this will take us anywhere, but it seems to me, on my very superficial look at it, that it could be a promising way forward whereby we can get a greater link between the two.

Baroness Blackstone: I think the Committee recommended that a more realistic date for achieving 100% digitisation in hospital trusts was 2023 rather than 2020, but do we have enough people who can train all the hundreds of thousands of clinicians, both nurses and doctors, in this new digital world to achieve it by 2023? It is a huge task, is it not?

Professor Keith McNeil: It is a huge task and it depends on what we mean by what we want to achieve, because this will be ongoing beyond 2023 into 2025, 2030 and beyond. We will accomplish an enormous amount by 2020 and are driving very hard at the original 2020 vision. In reality, will we get everybody there? Probably not, but we will cajole, incentivise and inspire people to try to get as far as they can. There are organisations starting at different levels, so we want everybody to raise the bar, if you like. We have a tremendous capacity in the workforce right across the NHS and across social care. The key is to engage them and empower them to make these changes. We cannot do it from the top and, in fact, the ethos of the programme is to devolve wherever possible and centralise only where critical and necessary. That is really important because, if we do not empower the workforce to do this, it will flounder.

Professor Sir John Bell: It is worth remembering that the Americans did this in a really short timeframe. They, essentially, digitised their entire healthcare system, which, as you know, is chaotic at best, and

they did it by incentivising the hospitals and making sure that reimbursement was directly related to the ability to digitise. If the NHS tomorrow said, "Do it at whatever pace you like, but you will not get paid if it is not digital data", I can tell you that, by Christmas, you would find a lot of stuff had happened. Hospital trusts have a lot of stuff on their plate, so why would they do it when they are doing everything else? There is a bit of a problem in incentivising these places in the way we need to. The American example shows that it can happen really fast.

Andy Williams: I do not want to underestimate the point that you are making, but one of the characteristics of digital technologies is that they are easy to use. One of the things we have to work on with technology and its use across healthcare is making it easy to use, not just for the patient but for the clinician. That is one of the things you could look at over the last 10 years where we have not done as well as we could have, so we have to do better.

Q242 **Baroness Blackstone:** Of all the things that we have discussed today, what single key change should the Committee be recommending to sustain the health service over the longer term?

Professor Keith McNeil: If you are asking around digital—

Baroness Blackstone: Broader really.

Professor Keith McNeil: Broader, we have to get social care up to speed. That is where the money is, for me.

Professor Sir John Bell: I think it is about being really rigorous about taking innovations and trying to evaluate how you can extract the costs of innovations in a closed system, measuring and evaluating everything and then recommending that across the system. That will make a huge difference.

Andy Williams: I would say that, in many ways, this is not a technology challenge; the technology largely exists and will continue to exist. Like everything, it is a people challenge, so the one thing I would point to is to get the leadership at all levels across the system to understand the benefits generally and the benefits in particular to their organisation of these sorts of technologies.

Dr Ron Zimmern: I think data is at the centre of all this. No matter what technology you look at—epigenetics, microbio, liquid biopsy—in the end it is about data and data sharing. To do that properly, you have to engage the citizen, you have to break down silos and you have to actively develop leaders. Without that, you will not get the data sharing which is absolutely at the heart of everything that we want to do.

The Chairman: Thank you all very much for coming today. You have been very helpful. If you do think of something else that will help us, please feel free to send it in and we will record it as evidence. Thank you for coming today.