HOUSE OF COMMONS

Health and Social Care Committee

Oral evidence: Future cancer, HC 1250

Wednesday 19 July 2023

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Watch the meeting

Members present: Steve Brine (Chair); Paul Bristow; Mrs Paulette Hamilton; James Morris.

Questions 55 - 90

Witnesses

I: Professor Matt Brown, Chief Scientific Officer, Genomics England; Professor Stephen Duffy, Professor of Cancer Screening, Wolfson Institute of Population Health, Queen Mary University of London; Marcel Gehrung, PhD, Co-founder and Chief Executive Officer, Cyted; and Sara Hiom, Vice President, NHS Implementation & External Affairs, GRAIL Europe.

Examination of witnesses

Witnesses: Professor Brown, Professor Duffy, Marcel Gehrung and Sara Hiom.

Q55 **Chair:** Good morning. This is the Health and Social Care Select Committee. This is our last session of term and we are looking ahead at our future cancer inquiry, in which there is huge interest and there is a lot of excitement among the Committee about it. This is the second oral evidence session of the inquiry. We are trying to understand how we can more effectively screen for cancer, detect it early, very early, upstream of symptoms, and how we can treat it in a much, much more targeted way, with much more precision.

We have a fantastic panel who are, hopefully, going to enlighten us in that respect. Professor Matt Brown is chief scientific officer at Genomics England; Professor Stephen Duffy is professor of cancer screening at the Wolfson Institute of Population Health at Queen Mary University of London; Marcel Gehrung is co-founder and chief executive of Cyted, which the Select Committee will be visiting in due course; and Sara Hiom, is vice-president, NHS implementation & external affairs at GRAIL Europe.

To start with you, Sara, what we are really interested in, in this inquiry, is very much looking to lift our gaze beyond the 28-day faster diagnosis standard, the 62-day wait and all of that stuff. It is critically important and we do not ignore it as a Select Committee. We have had Cally Palmer, Peter Johnson and the NHS England cancer team in several times, and we will have them in again to track where we are on that because it matters to patients now. But what we are interested in here is very much the future. There is a huge amount of excitement about GRAIL and the ongoing Galleri trial. Could you give us an update on the trial and how excited, or not carried away, we should get about what it promises? Could you very briefly summarise what it promises, because not everybody who is watching will have heard of it?

Sara Hiom: First of all, for an update on the trial, we have just finished the second year of a three-year active period of the trial. We recruited just over 140,000 people in 10 and a half months in 2021 and brought them in for their first round of blood tests. This is a randomised control trial, which means that half of those people, around 70,000, will have had their blood taken and then stored. The other half will have had their blood taken and then tested with the Galleri test. That is our intervention and our control arm.

We will be repeating that blood draw and the test in the intervention arm twice more. We have just finished the second round; everybody has now had their blood taken twice. Starting in September this year, we will be doing the third and final year of active testing. We will wait another year after that, another year after the last patient or member of the public is in the trial, and then assess the final data at the end, after which the National Screening Committee will make adjudications and judgments on

the basis of the final analysis. In the meantime, we will be looking at the interim results early next year. On the basis of those, and if the trial has been successful up until that point, GRAIL is in an understanding and a partnership with the NHS to roll out the test to 1 million extra people starting from summer next year, depending on those interim results. That is where we are on the trial.

As with any test that is used, especially for a screening programme where we are looking at asymptomatic people who are otherwise seemingly well, we need to be really rigorous in the amount of testing we do. Already, the Galleri test has been extensively clinically validated through studies in the US and the UK, but this NHS Galleri trial is the first randomised controlled prospective trial looking at the clinical utility of the test in the NHS in this country. The NHS was the major partner that gave us the ability to utilise not only the infrastructure that exists but the centrally collected data that enable long-term follow up of everybody on the trial, both in the intervention arm and in the control arm, so that we can compare the outcomes, the cancer outcomes, for the people on the trial with the test and those without the test. That is how we will know how well it performs.

GRAIL's ambition is to see a future in which cancer is detected at an early stage, in which it can much more easily be treated, and will have longer-term survival, and to do that, wherever possible, even before symptoms begin. We are a long way forward with that now. We are hugely excited, obviously, by the potential of the trial, but as with any test, as I said, it needs rigorous analysis and assessment and that will be ongoing.

Q56 **Chair:** You guys in the cancer community are, rightly, always circumspect. You try to manage expectation and, hopefully, under-promise and over-deliver. No pun intended, but this really does sound, from what I have read and heard, to be the holy grail. How excited, on a one to 10 scale, could I get, do you think, about true upstream prevention, pre-symptomatic prevention?

Sara Hiom: We can all get very excited about the potential, undoubtedly. Prior to my work at GRAIL, I was 20 years at Cancer Research UK. I spent 18 of those years focusing on earlier cancer detection and prevention and how we get there. I moved to GRAIL because of the potential of this test and also because my chief exec at Cancer Research UK had moved to head up GRAIL Europe. I feel, and I think we all feel, certainly at GRAIL, that this test has huge potential.

Chair: Yes.

Sara Hiom: It has the ability to detect a signal that is shared across many different types of cancer, over 50 to date. If it detects that signal of cancer, it is able to predict the tissue or whereabouts in the body the cancer is likely to be located.

Q57 **Chair:** Finally, to give an example, pancreatic cancer is legendary for its

lethal late detection. Are pancreatic tumours one of the cancers this trial could try to detect very early?

Sara Hiom: Yes, it is. In fact, pancreatic cancer is one of 12 cancers that are particularly aggressive and account for high mortality. The Galleri test has a particularly good ability to detect more aggressive tumours, such as pancreatic, oesophageal, stomach, lung and colorectal cancers. Those 12 cancers account for something like two thirds of all cancer deaths. If we think about the cancers that we do not screen for in this country, they account for 78% of all cancer cases and 83% of all cancer deaths. We are not screening for those at the moment. The real potential is for cancers like pancreatic cancer and other aggressive tumours that are less common and are almost never likely to have their own individual screening programme.

Q58 **Chair:** We will come later to how we land on those 1 million and more. James Morris might touch on the data. Turning to your left, to Marcel from Cyted, your core product, the cytosponge, is your flagship. Sara mentioned oesophageal cancer as equally challenging to detect early. Tell us about that, and then tell us about other products you are working on that can help with our future wobbles.

Marcel Gehrung: To recap briefly for Committee members and the general public, the technology we are working on is a capsule sponge technology. It is a technology where patients swallow a small pill on a string. It goes into the stomach. In the stomach, after a few minutes, the capsule dissolves, a small sponge expands and then that is withdrawn and collects cells from the digestive system, particularly the upper part of the digestive system. We can then look at those cells for abnormalities.

One of the very interesting things, as a follow-up to what Sara said, is that we are very much focused on detecting pre-cancer. In a large, at-risk population of patients living with heartburn and reflux symptoms, which is many millions here in the UK, what we are trying to do is address a population that is at elevated risk of developing one of the most lethal cancers there is, oesophageal cancer, but we very much focus on detecting it at a preventable and treatable stage that is much earlier than the late stage associated with very high mortality, resulting in low survival rates of less than 15% over 10 years. It is certainly down there among the most lethal cancers like pancreatic cancer and certain brain cancers. This is what we have been focusing on in the last three years, and on delivering this together with the NHS cancer programme in England and Scotland.

The opportunity for what we are doing is very much going to a symptomatic population, instead of a general screening programme for the asymptomatic population. What we see is that, by developing technologies that are focused on specific, at-risk populations, we have a very defined population to work with, and we have a very defined population to create awareness with. That is what we are working on, building an association and awareness of, for example, heartburn and

reflux symptoms predisposing a patient to develop Barrett's oesophagus, which is a pre-cancerous lesion for oesophageal cancer that has around 1% prevalence in the UK population. That is what we are focused on right now. To your second point, we are currently building out from that around what other diseases and cancers in the upper GI tract we can use this technology for and potentially expand the indications we can diagnose with these technologies. To summarise, it is really focused on a population that is symptomatic, but trying to detect cancer as early as possible, even before it becomes cancer.

Q59 **Chair:** Fascinating. The next stage in this is with you, Professor Duffy, from Queen Mary University. Does future cancer still maintain an important part in population-level screening programmes, in which you obviously have great experience? What does that look like in the next chapter?

Professor Duffy: I do not have a particular invention. What we are going to see in the future is smarter exploitation of some of the things we are doing already. For example, at the moment, we do faecal immunochemical testing in the bowel cancer screening programme. It does a good job, but in England, for example, if there is more than 120 micrograms of haemoglobin per gram of faeces, you get a colonoscopy. If there is less, you get another test in two years. That throws away all the continuous information about how much haemoglobin there is in the faeces. I would like to see better exploitation of that.

The reason we have that very stark threshold is that we only have so much capacity to do the colonoscopies. For instance, supposing you said, "If it's more than 50, but less than 120, we'll do a repeat one just to check for persistence," that would increase the effectiveness of the programme without putting a huge burden on the endoscopy services. Generally, from our point of view, a lot of the things we work on are how we can do the stuff we are already doing better. I am sure we can think of examples in other areas of cancer screening as well.

Q60 **Chair:** That is a very good point. There is always a balance between the risk and the reward, and how we access bits of the population where we will get the best chance of finding something we can help with. I can see that. That is a real challenge in a population size.

Finally, before we move on, Professor Brown from Genomics England, on the treatment side of things, you led efforts in Australia to translate research sequencing capability into precision medicine programmes for cancer patients. What are the headlines we should understand at the start of this inquiry around precision medicine?

Professor Brown: I hope we get to talk about genomics in screening as well, because it has a significant role there. The headlines are that the costs of sequencing are plummeting at the moment. Genomics is going through a turning point in its costing, and its potential, therefore, for large-scale roll-out. Until about 12 months ago, a whole genome

sequence in the UK cost between £700 and £800 or about $1,000. Since the beginning of this year, there have been technologies that have come about and competitive tensions in the market that have meant that the cost of sequencing has dropped significantly. You can get a whole genome sequence for $100.

Chair: It is not often someone comes before us and says stuff like that. That is great to hear.

Professor Brown: That means that instead of being almost a boutique research tool, or a tool you only use in extremely severe circumstances, it is a tool that is sufficiently low cost that you can consider quite widespread adoption, either in screening cancers for precision medicine in people who already have cancers or, alternatively, screening for risk of cancer or to assist with early diagnosis of cancer and predicting people's likelihood of having cancer if they turn up with symptoms.

That is the big news story. Basically, the test will reduce its costs significantly. It means that genomics-informed, personalised cancer medicine will be able to be used much more widely, at a much more affordable rate in developed countries like the UK. In addition, developments in cancer management and, in particular, cancer chemotherapy over the last decade have largely been about molecularly targeted cancer therapies. That means genomics becomes much more important in guiding therapeutic decisions in modern cancer treatment than it was a decade ago.

In the UK, we have really good cancer genomic services, although uptake of those varies significantly by region, and their performance also varies significantly by region. Currently, roughly one in eight cancers is listed in the national test directory as being indications for whole genome sequencing for cancer, but only about 1% of all cancers actually end up having a whole genome sequence because uptake is so poor. That varies region by region. It also varies by ancestry and by socioeconomic status. Reducing inequality in the use of existing funded tools for cancer-precision medicine would be something that could bring about significant improvements to management.

Q61 **Chair:** That said, help us out with regards to the work that we do and recommendations that we make to Ministers. How well set up do you believe the system in England is at the moment, the NHS in England, to take advantage of some of the opportunities you have just talked about and the very dramatic cost drop that you have explained to us?

Professor Brown: I think the NHS is doing its best, although it is struggling to make the most use of this potential.

Q62 **Chair:** What are the three things you would like to see change?

Professor Brown: I would like to see more investment in genomic laboratory hubs so that they can deliver on the potential of cancer genomic screening. In particular, there is a need for a marked expansion

of analytic capacity in genomic laboratory hubs so that the turnaround time for genomic testing and reporting on tests gets down to something that is clinically useful. At the moment it is way too long.

I would like to see more emphasis on evening up inequality, particularly when it is geographic, economic, ancestry-related or ethnicity-related. Those things are all closely related anyway and need specific attention. There needs to be some forward planning on how the NHS can better use genomics, given that the cost of the test is going to fall so low in the near future.

Q63 **Chair:** That is brilliant. That, in a nutshell, is why we are doing this inquiry. What forward planning needs to happen in 2023-24 to make sure that in '33-34 and '43-44 we are in a place to make use of this emerging technology? That could be the same for any one of the four of you who has spoken. There is clearly an implication in the work that GRAIL are doing with Galleri around how we scale that up and who pays, given that resources are always finite. We will come back to that. In the meantime, our colleague Paul Bristow is going to take it forward.

Q64 **Paul Bristow:** The Committee went to America earlier this year. We spoke to a lot of clinicians about the potential of AI in identifying cancers. Professor Duffy, what are your thoughts on the potential of AI, with particular emphasis on how you think it is going to be adopted across the NHS, or used across the NHS, considering that in some trusts we are still using fax machines?

Professor Duffy: I see quite a strong potential for AI in, for example, reading of mammograms in the breast screening programme. In the programme, they are working their socks off at the moment to catch up after the hiatuses of the pandemic, and so on. There are going to be issues with the number of staff needed to double-read mammograms, and they are not going to get any better over the next few years. Those issues are not going away.

It seems to me, and it seems to a lot of people, that AI systems have already been shown to be very good at detecting cancer in mammograms, so they are safe in that respect. I suppose the policy people are still treating it as a research issue—that we do not quite know enough. My feeling is that the circumstances of staff pressures, and so on, really dictate that we get on with answering the questions that remain about AI and the effect on reader behaviour and so on. I feel that could be done faster than it is being done at the moment. Technology goes much faster than the research community can evaluate it in any case. The trouble is that we cannot always wait, because we have the problem now.

Q65 **Paul Bristow:** Professor Brown, what are your thoughts on the potential for AI diagnosis?

Professor Brown: It has lots of potential across a wide range of different areas, from reading imaging to GRAIL, which is actually an AI-

based test as well, to genomics, where interpretation of sequencing data is largely a cottage industry, basically done by people giving expert opinion; yet it is a big data question that should be addressable by AI.

There have been previous attempts to commercialise AI interpretation of whole genome sequencing, through IBM, for example. They have largely been unsuccessful, but there are a lot of projects in academic and commercial research at the moment that I expect over the next few years, the next two or three years, will end up having real applications and will mean that analysis of whole genome sequence data, for example, will be significantly AI-driven.

Q66 **Paul Bristow:** Sara, Professor Brown mentioned GRAIL when it comes to AI. Do you want to elaborate?

Sara Hiom: As Professor Brown said, the Galleri test is an AI-based test. Essentially, it looks for DNA methylation patterns in the blood—cell-free DNA that is released into the blood by cancer cells. It is able to distinguish that shed by a cancer cell from that shed by a normal cell. It is able to do that because of constant rounds of machine learning and honing an algorithm, essentially. We have a classifier that is AI-based. The test looks at the patterns and is then able to distinguish between cancer and non-cancer and then give an idea of where in the body that cancer is going to be, so that it can direct the subsequent diagnostic tests that would be needed.

Q67 **Paul Bristow:** Wow. Changing tack slightly, Marcel, I have heard of your innovation. It is not brand new; it was certainly talked about a few years ago when I had a different career. Unlike AI or anything like that, it is a very simple innovation. How confident are you that the NHS will be able to adopt it at pace and scale?

Marcel Gehrung: To your point on the simplicity of the test, it is composed of two different components. One of them is a device to collect the cells. At the laboratories, we are now working on various AI-aided algorithms to integrate demographic data of patients—age, family history—into a classification algorithm that enables us to be even better at triaging patients between pre-cancer, high risk or low risk of progression or whether they can be discharged and basically reduce pressure on various endoscopy or NHS resources. In our case, the big opportunity is in the next generation. On Sara's point about what these AI technologies are doing, they are able to bring different types of data together to improve tests and to improve how tests will impact outcomes in the long run.

From a delivery perspective, one of the very interesting parts around simplicity is delivery in the community setting. The simpler the procedure, the easier you can bring it from a secondary care out-patient setting into primary care and community care practice, so community diagnostic hubs play an important role. Given the evidence we have been building over the last decade or so in various UK populations, it has been

proven to demonstrate that it can find 10 times more pre-cancers than the current standard of care does.

The opportunity is in how we get that operational and move it into a healthcare setting that is as accessible as possible and enables as many patients as possible, particularly in areas of the country where we suffer from large health inequalities, to access these tests in a community-based and primary care-based setting.

Q68 **Paul Bristow:** Do you worry about that access challenge? In some ways the NHS does okay, but it has not always been brilliant at adopting innovation and new pathways, and at doing that on an equitable basis.

Marcel Gehrung: In our specific case, one of the things that was fantastic to see was the agility of the NHS during the pandemic in reacting and deploying this technology in a pathway where it has and had significant impact on endoscopy demands across the country. It was diverting very precious resource away so that secondary care hospitals could focus their resources on something that mattered, not looking at patients where, for upper GI endoscopies, which is the intervention we are looking at, it creates 70% of endoscopies that have no clinically significant findings. It was really diverting that away.

To your specific question, the big point for us to look at right now is that we have adopted this technology in a very rapid way during Covid, and I think it is very similar for GRAIL and the Galleri test. What happens to these technologies next? They have been proven, and they are well evidenced. What frameworks, strategies and programmes are in place in the NHS to take technologies that have that traction and that background and get them to as many patients as possible? There is work to be done on understanding what that looks like because at a time when we have lots of these technologies, which build momentum and have a lot of evidence, we have this gap. It works, and we have demonstrated that it is cost-effective, but how do we now get it out there?

Paul Bristow: That is the challenge, isn't it? What is the lever and the driver that is going to change clinical practice at pace and scale? Thank you.

Chair: As trailed, James Morris.

Q69 **James Morris:** Thank you, Chair. It seems to me that we are on the verge of several quite significant breakthroughs from a research and clinical point of view and from a technology point of view, but there are constraints. I want to ask about some of the constraints.

The expert panel for this Committee was looking at digitisation of the NHS. In relation to the Government's commitment to "transform access to and linkage of NHS health and genomic data for data-driven innovation and inclusive clinical trials, whose results will be critical to ensuring public confidence in data access for research and innovation purposes," the panel said it requires improvement. Professor Brown, what is your take

on the gap between what you can see as the potential in your area with the reality of delivery within the current constraints of the NHS?

Professor Brown: This is something that came up in the O'Shaughnessy report about clinical trials. There is no current national comprehensive phase 1 to phase 3 clinical trial registry for cancer clinical trials. The consequence is that there are significant numbers of patients who could be enrolled in clinical trials but who are not. It is not easy for the NHS to link reporting of cancer screening to clinical trial access and potential for patients.

That significantly reduces the value of cancer-precision medicine testing. It would be a relatively simple win to fund the establishment of a clinical trial registry that includes the molecular inclusion criteria for the trials—in other words, what DNA mutations are needed to get into the clinical trials—so that when NHS sequencing for cancer gets done, patients can find out rapidly whether they are eligible for particular trials for their cancer. The evidence indicates that patients who are enrolled in clinical trials generally do better than patients who are not.

Q70 **James Morris:** Is there any work going on in the NHS in relation to the particular initiative that you are describing?

Professor Brown: There is a lot of wish for it, but it is not actually happening.

Q71 **James Morris:** Marcel, you talked about the next stage, and what happens to these technologies. Again, that is subject to constraint in what is deliverable within the current NHS digital environment. What is your take on the constraints?

Marcel Gehrung: One of the key elements in a healthcare system like the NHS is the balance between technology feasibility and the cost-effectiveness of implementation. We know of some digital interventions, ranging from digital therapeutics to digital health measures like the GP at home feature, which would bring massive opportunity, but we face a headwind around, for example, the consolidation of IT infrastructure across the NHS. People talk about being able to access the electronic health records of a patient and use them in an intervention, but if a patient has symptoms at home and wants to go to their GP and to receive care, the challenge is where does all the data come together and who has access to the data at the right point in time? The question on that side, particularly around the broader challenges, is not whether the data is there; the data is somewhere in the UK. The question is whether the right people have access to it at the right time.

Q72 **James Morris:** One of the particular weaknesses that we identified in our work was in data interoperability. As you say, the data exists but it is not consolidated. What is the solution? Is it just more investment and a more strategic focus on that in the digital piece in the NHS?

Marcel Gehrung: One of the best initiation points for this in our experience, if there is a technology or an intervention that serves or addresses a specific clinical need, is whether you can build around the technologies and basically build infrastructure from the inside out, instead of just generically saying, "We need to invest in NHS IT infrastructure." I think Sara might want to add to this point. GRAIL has undertaken some monumental effort, and we are now doing a lot of work around prescription records in the UK and how we can use those to find patients and offer them our test. The easiest way is when you have a specific intervention where you know what happens with the patient in their pathway. We then build IT infrastructure from the inside out instead of from the outside in.

Q73 **James Morris:** Sara, what is your take? Was your trial constrained at all by existing infrastructure weaknesses?

Sara Hiom: First of all, I have to talk to a real success story of NHS digital infrastructure, which is NHS DigiTrials. That was the key reason why we were able not only to recruit 140,000 people in 10 and a half months but to do it in an equitable way. This was the first use of NHS digital trials outside the covid era. It was used very successfully for recruitment to a lot of the covid treatment trials, and it was used here for the first time in cancer.

Q74 **James Morris:** It was an innovation that came out of covid, as it were. Was it something that emerged as a result of the ability that we had to—

Sara Hiom: It emerged as a result of the necessity urgently and rapidly to recruit people to trials. We were able to utilise that success story in cancer to great effect. In fact, we were able to build an algorithm using the data that we had about the areas we were inviting people from, to ensure that we over-invited people from the most deprived areas, so that our overall cohort would be nicely balanced between those in the most deprived groups and those in the least deprived groups. Usually, in clinical trials, we get a very healthy volunteer bias. We greatly tend towards having people who are better educated and better off, essentially. DigiTrials enabled us to do that, and to do it at quite a rapid rate.

Marcel is absolutely right. It is better the more that we can work in partnership and develop infrastructure from the inside out. For example, the trusted research environment that I know is being created, albeit a little too slowly at the moment, will enable researchers to get access to linked data and to be able to do their research in a safe and secure way.

Q75 **James Morris:** On diagnosis and screening, we had some evidence where Cancer Research UK, identifying some of the weaknesses in the existing digital infrastructure, said: "Existing infrastructure would struggle to facilitate complex call/recall arrangements that mean different people are offered different tests, or screening at different intervals." Do you think that is a constraint on the evolution of screening and diagnostics,

Professor Duffy?

Professor Duffy: For sure, the IT systems for breast cancer screening have been due for overhaul for many years, for example. I am told that there will be substantial improvements within the next two years. It seems to me that it must be within the wit of man to have an IT system that can handle different regimens for different people, if necessary. I am trying not to say, "It's not rocket science." It is probably a constraint now, but I do not see it being a constraint a couple of years from now.

Q76 **James Morris:** If we have an environment where we are screening for multiple different things, in two years' time we should be in a position to cope with that. Is that your view?

Professor Duffy: I am probably being over-optimistic at two years, but say five years.

Chair: We like optimistic. On that note, we bring in Paulette Hamilton.

Q77 **Mrs Hamilton:** I am going to target my questions towards Professor Duffy and Sara Hiom. I have been reading that Cancer Research forecast that we will have a massive increase in cancer rates, from 384,000 cases per year to 506,000 cases per year by 2040. What does NHS England plan to do to improve the take-up of screening?

Professor Duffy: We have already been doing a lot of work and a lot of thinking about improving the uptake of screening, particularly in populations that are already under-served. While we do not have all the answers, we are doing considerable work on trying to find them. For example, the breast screening programme has funded us to do a four-way comparison of different invitation strategies.

I am a bit worried about one thing. I am sorry to keep harping back to breast cancer screening, but we are clearly moving from a system where you used to get a letter with an appointment, and a date, time and place for it, to one where you go online and book your own appointment. You get a letter telling you to go online and book your appointment. That has the potential to further put off certain populations who are slightly more digitally shy, as it were. We have a big job to find out how to reach the people for whom this is a new world, where the customer goes online to do everything and books it all themselves. How do you reach all of your population despite that? Do some people still need to have the old system, for example, of being sent a fixed appointment for screening?

If we knew, we would have solved the problem already, but there are still certain ethnic populations and people of lower socioeconomic status to whom screening is not delivered as much. It is changing. Before the pandemic, the socioeconomic gradient in participation in breast cancer screening was getting smaller and smaller. Then the pandemic hit us and we have probably fallen back a bit. As I say, I do not know all the answers, but we are looking for them.

Sara Hiom: I think there are two main ways in which the NHS is looking to improve screening programmes. The first is looking at new screening tests. Obviously, Galleri is one that we hope will give the opportunity to be able to diagnose many cancers at once through this screening technology. We never know what cancer we are going to get, so when it comes to screening programmes, being able to screen for many types is very important.

As Stephen alluded to, the other thing is about accessibility. Much more needs to be done, and I think we now better understand the barriers to accessing screening. We have decades of research on this, so we know what needs to happen, but it needs to be translated into action. That requires a lot of forethought and planning on both the information provision, to explain what the screening test is about and how it works, and making it as easy as possible to access the appointment that you need to have for whatever screening programme it might be. That involves the provision of information in various different formats, be that braille, large print, translation into different languages or, indeed, having translation services.

One of the reasons we were able to recruit significant numbers of ethnically diverse groups on the NHS Galleri trial was that we had a number of means and methods. We worked with community groups in areas of high ethnic diversity to understand and to talk to the people that those groups would respect and understand. We talked to them about the trial and explained to them why it is important for those groups, and to encourage them to come on board. Sadly, there is a lot of mistrust about clinical trials, and even, in some cases, the NHS, among certain groups. It is really important to try to find ways to overcome that. Hopefully, as Stephen said, our digital transformation of screening, in which we will have a much more integrated digital system to send invitations, certainly on the basis of risk but increasingly on the basis of ethnic or social deprivation, should also help.

Q78 **Mrs Hamilton:** That is excellent. There has been a lot of talk about moving screening to a more local level. First, do you have any examples, whether it be local, regional, national or international, of where that has actually worked? Secondly, how easy has it been to transition to that local level? I will start with Professor Matt Brown. Let's spread it out. Spread the love.

Professor Brown: I am not sure I am the best person to answer that question.

Mrs Hamilton: I don't think you are, so you can pass it on, but you were sitting there and I thought, "No, I'm going to see if he's on his toes."

Professor Brown: I want to come back to the question about targeting screening, if that is okay.

Mrs Hamilton: That's fine.

Professor Brown: One thing the NHS is doing is looking at the use of genomics to pick people who have high risk of cancers and therefore to personalise screening programmes. At the moment, you will be aware that the uptake of screening is fairly low; for faecal occult blood testing, for example, it is only about 40%. It is intuitively likely that, if you can tell people that they are at high risk of particular cancers, they are more likely to get screened. Whether that is the case has to be demonstrated, but it seems likely.

There is a programme that you may have heard of called Our Future Health, which will be screening 5 million people over the next three to four years. It uses a genetic screen to inform patients and their clinicians about their likelihood of getting particular diseases, including any common cancer types. I see it as a future application of genomics to be able to target people at high risk of particular cancer types and to really push them to make sure that they get screened properly.

There are also uses of genomics to pick up the roughly one in 20 cancers that occur in people who have single-gene variants which cause the cancer. We do not use those nearly enough at the moment. For example, about 5% of colorectal cancers are caused by a single genetic disorder called Lynch syndrome. So far, we have diagnosed fewer than 10,000 patients in the UK who have Lynch syndrome. It is thought that roughly 200,000 in the community have it, but, of course, we do not have a community-level screening programme for Lynch syndrome. We could do much better with our targeted screening if we properly applied genomics, both for single-gene disorders and for multi-gene common and garden cancer types using, for example, the Our Future Health approach.

Q79 **Mrs Hamilton:** That is excellent and really interesting. Do you want to add something, Sara?

Sara Hiom: As well as the genetic determinants of risk, there are social determinants of cancer risk. We know that cancer is not only more common in more deprived groups, but cancer mortality is higher in those deprived groups. Being able to get the screening tests, whatever tests they may be, to local areas is going to be hugely important, because people with greater social deprivation are less able to travel long distances to appointments.

To answer your specific question about local, certainly the NHS Galleri trial used mobile units to travel to the places where people live. We did not expect people to come to hospitals or to centres; we went to them. We had seven large units and four small units that could get into much more rural locations, often to excluded groups as well as into the city centres where people would be more likely to pop on board and see what was going on. I know that is also increasingly happening with mammography. The use of mobile units to reach people in inner cities is a way forward, as indeed are the community diagnostic centres which will offer opportunities for diagnostics in local areas.

Q80 **Mrs Hamilton:** I absolutely agree.

Marcel Gehrung: To add to what Sara said, what we have done similarly, along the lines of delivering the test in mobile diagnostic units, is partnering with Heartburn Cancer UK, one of the biggest patient representative groups in the UK, and trying to understand their members' motivations in accessing and participating in these types of programmes or initiatives. Sara has already outlined this really nicely. The interesting part is engaging with those local communities and understanding their barriers to accessing these types of tests. Is it because they do not trust their GP? Is it because they do not trust the NHS? Is it because they do not trust technology? Is it because they do not trust trials?

If we bring something right to them, like when they go to work in the morning or are just walking around their hometown, they see it right in front of them. I am sure many of us have seen the targeted lung health check vans in various parts of the country. We are now working on this envelope, which is called heartburn health check, which makes the technology of what we do much more accessible to people. When you walk past our mobile diagnostic units, there is an element of advocacy and engagement. It is not just that you get a test there. You can also just come to the unit and ask. How do you get that engagement to a local level so that people do not even need to take their phone in their hands and go to a homepage? How can you do it while they are walking to the supermarket? It is getting awareness right to the point where it hits the most, because that is where people usually engage.

Q81 **Mrs Hamilton:** Let me put a challenge to you on that point. One of the big issues is the time factor. The mobile vans do come, but they come between 8 and 4 or between 9 and 5, when many people, if they are not at work, are doing their little cleaning jobs or looking after children. Sometimes we need to be uncomfortable with the times that we put these things in those places, so that people can get to them, especially people where perhaps English is not their first language. They do some of the most difficult jobs that we have in this country, but they are not doing them from 9 to 5. For me, time is part of the issue in all this.

Every mammogram I have ever had has been in a mobile van. I don't know what it is like to go to a hospital. They plant it in a car park, I go there, I have it and it is done for three years. I am in an inner-city area, and it would be the same for rural. My honest belief is that if we want the uptake for screening to get better, we have to start thinking out of the box, so this is my other question—tell me when you want me to shut up, Chair. What good practices have you seen, regionally, nationally or internationally, that you would like to bring into local areas, or that perhaps you are struggling to bring into local areas at the moment?

Sara Hiom: I think it is more of the same. It is more of the ability, as you said, not only to bring the test, the innovation, the screening or whatever intervention it might be, closer to the people, but also to do it in hours when they can access it. In fact, we know from NHS Galleri that

it was not until we started Saturday openings in the trial that we increased the involvement of certain groups. You are absolutely right that they needed a time when they could access it outside office hours. We had already started earlier in the morning, and we were trying to extend it until later in the evening to try to catch people who were working from 9 to 5, but doing the Saturday appointments as well made a huge difference.

Once you have positioned your intervention locally, you need to understand the way in which you talk about it and explain it. Not everybody necessarily understands what screening means. A lot of people think you need to have symptoms even to access a screening programme. They think they have to be unwell. A lot of people still do not understand that screening is for people who are seemingly well. We can now do so much more to detect diseases at an earlier stage so that we can prevent them from causing death and morbidity.

Q82 **Mrs Hamilton:** Professor Duffy, earlier you talked about the workforce. That is a massive issue, and I talk as an ex-nurse myself. At the moment there are some terrific things going on in cancer care, but I am not sure that the workforce are keeping on track or are as advanced as they need to be to be able to read the records or to get people there to do what needs doing. Do you think the NHS workforce plan, which has just come out, goes far enough to capture some of the issues you are facing in this area?

Professor Duffy: Personally, I have to admit ignorance. I am not familiar with the workforce plan, but I can talk about the workforce as they are now. They have proved to be very resilient and adaptable. The last three years have shown us that. Essentially, I think the workforce in the NHS, if there are enough of them, can take whatever is thrown at them, pretty nearly.

One of the issues, of course, is that there are not enough of them in certain areas; for instance, we cannot do as many colonoscopies as we would like. We are struggling to maintain double reading of mammograms in the breast screening programme. In many ways it is actually a question of getting more people into certain areas of health service activity. The workforce themselves, the people in the health service, have proved themselves to be terrifically adaptable.

Marcel Gehrung: Speaking to your background as a nurse, one of the major initiatives we have been driving is trying to understand how we can change the pathway that patients go through and build nurse-led services around it. How do we move certain resources and redistribute them in the existing workforce to make use of people who are highly skilled healthcare professionals and are completely able to deliver certain procedures independently? As we have seen in certain countries, there are nurse practitioners. Even here in the UK we have nurse endoscopists, who can deliver endoscopies completely independently. With phlebotomy, for GRAIL, there is already an excellent pathway, but there are various

other pathways of cancer diagnosis where we could do a lot more work and use all levels of the workforce and engage them equally to build services that are led from the ground up.

It also speaks to the point of engagement, from a previous question. Who are the patients more likely to engage with? Is it someone who is more similar to them, for individuals from a more disadvantaged area of the country? How do you build something that is as accessible to them as possible? In our experience, we have seen that nurse-led services usually result in more patient satisfaction and improved patient experience.

Q83 **Mrs Hamilton:** Sara, are you a doctor or professor?

Sara Hiom: No, I'm not. I'm sorry.

Mrs Hamilton: You're not at the moment, but you will be.

Sara Hiom: I need to work on that one.

Q84 **Mrs Hamilton:** The question is the same for you. I am trying to get a picture. Do you feel that the NHS plan, if you know enough about it, has addressed some of the issues that our previous speakers have spoken about?

Sara Hiom: There is a lot in there to be hopeful about, definitely. Clearly, it will need to be fully funded. That is the issue. There has to be long-term funding for it. What is hugely welcome is the fact that we now have a long-term workforce plan that looks ahead, because that has been sadly lacking for rather a long time. I think that will be the key. Any plan that looks only at the next few years is not looking far enough in terms of workforce, and certainly not in training for specialist roles which, as we know, can take five-plus years. We really need to start doing that well ahead of the actual need.

To Stephen's point about resilience, there is no doubt that the NHS workforce are hugely resilient but, at the same time, we see large numbers of people burnt out after covid and therefore leaving the service. We need to be planning ahead, as well as thinking about what new roles will be needed in a new environment where technology plays more of a role to support people in the health service—for example, having patient navigators, which are alluded to, and more nurses with specialist interests who can guide patients through what can often be a very scary and disjointed pathway from first diagnosis to final care. All those things will be hugely important. Having them fully funded and long-term funded is going to be critical.

Q85 **Mrs Hamilton:** Professor Brown, you have the last word.

Professor Brown: I have worked, on and off, in NHS hospitals since 1994. I have obviously also worked in overseas healthcare systems. While I agree that the system is pretty resilient, I think at the moment it is not unfair to say that it is at the worst ebb that I have seen it in my time working in the system. A lot of it is not due to workforce issues but

is related to the efficiency of the systems and the problems with how the NHS operates. A lot of it is just the numbers of people, how pleasant it is to work in the NHS and the pressures that get put on people.

The workforce plan is excellent in that it identifies the problem with the numbers. It sets out a way forward, that over the next 10 years or so we will probably get at least sufficient numbers of trainees entering the system. I think it lacks a proper plan for how we are actually going to get that many trainees. Secondly, it says virtually nothing about retaining our current staff. To make a difference in the short term, retaining current staff would seem much more likely to have an effect than trying to increase trainees. As Sara says, it is going to take at least five to 10 years to train those people.

Q86 **Chair:** There are a couple of things from me before we close. In November, Amanda Pritchard, chief executive of the NHS, said that GPs will be given direct access to diagnostic tests such as CT scans, ultrasounds and MRIs for patients with concerning symptoms who, as Professor Duffy alluded to, fall under the threshold for urgent referral for suspected cancer. NHS England said this would help "to cut down wait times for"—routine testing—"to as little as four weeks" and potentially free up "hundreds of thousands" of appointments with specialists. The direct access scheme, as it is called, is intended to be delivered using community diagnostic centre capacity.

That sounds fantastic, but I can hear GPs sighing about their capacity, given that so many people could be in that bracket. Professor Brown, you said at the start that you hoped we would talk to you about diagnostics and diagnostic pathways. How can you help general practice, with the work that you are doing, to know better where to look?

Professor Brown: I share the anxiety that opening up imaging ordering will add pressure to GPs. I also think it is likely to result in a lot of inefficiency in the system by screening people who are basically the worried well. Genetics has a role in helping to prioritise a bit better. I mentioned the Our Future Health programme and the polygenic risk score programme, which can basically sort out people who are at high risk versus low risk. That needs to be built into care plan pathways, with tools made available to help GPs to assess an individual patient's risk when they are sitting in front of them.

Personally, I do not think opening up access to GP level and ordering all these tests is the right way to go. We need to be very careful about how we assess the benefit of this programme. It could not only cost a lot of money but, because of the limited amount of imaging available, result in more directed pathways not getting access.

Q87 **Chair:** Presumably, the logic of what you are saying is that you most certainly would not endorse the suggestion made by the Leader of the Opposition recently that people should be able to self-refer to secondary care. That would literally block secondary care with the worried well,

wouldn't it?

Professor Brown: I'm not going to get into a political question.

Chair: Forget who said it. The suggestion was made.

Professor Brown: The answer is that I strongly disagree with direct access to secondary care. I think the primary care networks are absolutely critical in filtering what goes through to much more expensive and much more limited-availability systems. There are countries in the world where there is direct access to secondary care, which show that it is not a great model. For example, the United States basically spends far more than we do on healthcare for not dissimilar or worse outcomes. China has virtually no primary care facility and runs everything through secondary care, and it desperately wants to change. One of the strengths of the UK system is primary care. We need to get back to strengthening primary care and, in particular, ensuring continuity of care for patients so that when they see the GP they see the same GP over and over.

Q88 **Chair:** Penultimately, I want to raise the issue of paediatric oncology. I am not sure who would be best to answer. Obviously, the conversation we have been having this morning has mostly been about detection in adults and the treatment thereof. We have not directly said that, but I think that is the assumption of what we have been discussing. Given that the biggest killer of children is brain tumours, who would like to touch on the subject of paediatric oncology when it comes to future cancer? Who feels qualified to say something about that? That's a free hit.

Professor Brown: I can comment to some extent, in that paediatric cancers are one of the tests for which whole genome sequencing is available on the NHS. Of course, that is once the cancer has actually presented, but it is highly informative for management of paediatric cancers. The UK does pretty well in this area. I would say it is significantly better than my own birth country, Australia, so it is something that we should be fairly proud of.

Chair: Good.

Professor Brown: However, outcomes are still well short of what you would like them to be. It is an area that obviously needs a substantial amount of research done on it.

Professor Duffy: One of the things that my primary care colleagues say a lot is, "Of all these consultations we do—however many we do a day—it is still only once every few weeks that we see an actual cancer patient." With children it must be an even bigger problem.

It is not just in this area, but in terms of primary care not being a gatekeeper but a pathway, one area which we see expanding already is being able to do certain biomarker tests in primary care that can rule people out and save them from onward referral to secondary care. For example, in the last few years GPs have started using faecal

immunochemical tests and so on. As the technology that some of my colleagues here work on progresses, my hope in the long run is that there will be simple blood tests or other biomarker tests for paediatric cancers that do not involve a huge battery of imaging to start with.

Q89 **Chair:** Finally, in the next few days we are going to launch an inquiry into men's health, which this Committee has not looked at for many years. It is not talked about enough on Select Committee corridors. There is an all-party group on men and boys, which looks at the issue. The Men's Health Forum tells us that men are at a 37% higher risk of dying from cancer.

Who would like to have a go on the subject of male cancers when it comes to the predictive nature thereof? Is it nature or behaviour? Where should we be looking in talking about men's health, and cancer in particular?

Sara Hiom: I can make a start, but I would very much like to pass over to my colleagues. Historically, men have been at greater risk for certain cancers because of smoking. For many years, men were most likely to smoke, increasingly more than women, but lately that has shifted. We might see that shifting because so many cancers are smoking related, as we know. There is also a behavioural element that we have seen in the past about men being reluctant to come forward and less likely to interact with the health system and the health service. Women are much more used to dealing with the health system and the health service.

I wonder if there is some glimmer of hope, because there is great interest in new technologies. We may be able to raise awareness of the technologies and how they pertain to men's risk; I am obviously mainly talking from a cancer perspective, but many of the lifestyle factors that increase the risk of cancer increase the risk of other diseases as well. If we can engage the male population in the technologies that are coming forward that enable us to detect diseases at an earlier stage, perhaps there is an opportunity for us to detect those diseases earlier and engage with them in order to be able to treat them more successfully.

Professor Duffy: There is currently a massive drive, in research terms, for ways of controlling prostate cancer. Traditionally, we have been reluctant to screen for it because we were aware that so many men had prostate cancer but did not suffer from it. It is becoming more and more of a real possibility that we can identify those who need treatment, and separate them from the ones who don't. I see that happening in the next few years.

Marcel Gehrung: To Sara's point, wherever the level of invasiveness is moving in the right direction towards non-invasive or minimally invasive testing for most male cancers, you will certainly increase compliance and uptake. Some of the cancers that we are talking about are more sensitive in their invasiveness for certain populations. Anything that moves the needle on the invasiveness of these types of testing or technologies will

make a significant impact on uptake, and therefore also, to your point, the outcome.

Professor Brown: Prevention is better than cure. Smoking, alcohol and obesity probably contribute to the vast majority of that increased risk. Obviously, as Sara mentioned, there is the likelihood of people getting screening, but on a public health level probably those three things contribute the vast majority of it.

Q90 **Chair:** The HPV vaccine is a good part of prevention.

Professor Brown: Yes, it is. For oropharyngeal cancer in males, for example, it is a really useful preventive tool.

Chair: Thank you so much. What a fascinating session. I hope you have enjoyed it and got across the points that you wanted to make. We have certainly given it a good go. Thank you Sara Hiom, vice-president of GRAIL; Marcel Gehrung from Cyted, and we look forward to visiting you later on in the year; Professor Stephen Duffy from Queen Mary University of London; and Professor Matt Brown from Genomics England. Thank you so much for your time.