

# nme

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The Cognitive Team

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# Improving health outcomes through patient education:

## How do we get it right?

By Dr Alice Wood, General Practitioner



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**P**atient education and engagement is fundamentally important when it comes to improving a patient's ability to manage their health and improve their health outcomes. By educating people about their health condition, they are more likely to be able to seek, understand, and act on the health information they are given. Insufficient health literacy can lead to health disparities, an increased use of the health system and poor health outcomes.

The influence on health from education is huge but without evaluating its performance, how can we measure its true impact on health outcomes?

### Measuring the impact of patient education

Not only do we need to ensure that patient education drives the improvements in health outcomes for which the education is designed, but we need to be able to demonstrate the return on investment of the education.

We now have techniques and technology available for evaluating the impact on patients. So, do they provide a more effective method of evaluating the impact on a person's health?

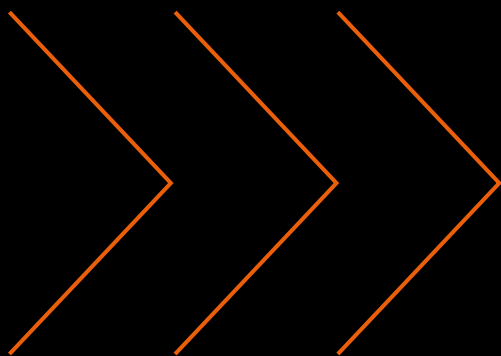
In the past, measuring the impact of health education programmes has not been

easy. Typically, it has been limited to a one-off measure of knowledge acquisition, sometimes comparing a group of people who received the education with a control group who did not. However, this method does not capture the education's impact on health outcomes.

Some have argued for the need for a conceptual framework and there have been recommendations to apply a randomised approach when carrying out studies. Indeed, the National Institute for Health and Care Excellence (NICE) has an evidence standards framework for digital health technologies. [➔](#)



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### **Can modern day technology revolutionise the evaluation of patient education?**

Progress in technology opens up new potential for measuring impact.

For example, we have much easier access to patients, thanks to the majority of people owning a smartphone. We can ask them questions about their health and their health knowledge over long periods of time. Electronic patient records now mean information and data about a patient is stored in one central electronic record (although only accessible with permission).

Patients can now monitor key vitals such as heart rate, glucose levels, blood pressure and blood oxygen saturation level through wearable devices and share this data throughout their life. This means a person's health outputs can be

measured over time, allowing for analysis of the data and a correlation with the health education delivered.

### **Big data is the big opportunity**

The greatest opportunity available to us for revolutionising how we evaluate patient education is big data. Traditional data processing software struggled to process large or complex data sets, but we now have big data tools which can do this. This means we can carry out more intelligent research with larger quantities of patients and data. Big data analytics also offer a range of exciting opportunities when it comes to measuring the benefits of health education.

Having a wider data set means it is now possible to connect patient records to build up a picture of how people manage their health.

Trials can also be conducted with bigger groups, either online via surveys or through apps. Having two comparable groups in studies gives a better picture of outcomes. For example, one company has done this by comparing the impact of written health information with avatar-led digital education programmes in patients with Diabetes and Chronic Kidney Disease. Not only did they find the response was positive, but they were able to test patients' knowledge over time.

Big data combined with using questionnaires to measure patients' subjective views about their health could help with identifying problems early and allow them to receive specialist care more rapidly.

Dr Chris Paton and the LIFE team at the University of Oxford along with the KEMRI-Wellcome Trust in Oxford have developed an educational



intervention for healthcare workers in Africa. The LIFE app uses a cloud database to collect anonymous data on educational outcomes in a cost-effective way. In the future, they aim to link LIFE data to routinely collected healthcare data to determine how effective the app is on improving patient outcomes.

### **The future of improving health outcomes through education**

When carrying out any form of health education the first thing to think about is the impact on the health

#### **Top tips for measuring the impact of patient education**

Define a measurable impact on the health outcome you want to achieve

Identify how to best identify this health outcome

Make use of wearables, patient records or patient-reported information to gather the information

Apply observation or randomised control studies (RCTs)

Analyse health outputs using large data sets, frequently over time

outcome you want to achieve. The second thing is to look at whether it is measurable. If we want to measure knowledge this should not be one off. Instead, we need to test knowledge over time as this will ultimately impact on health. Increasingly, thanks to digital technology, these things are now measurable because they are more accessible.

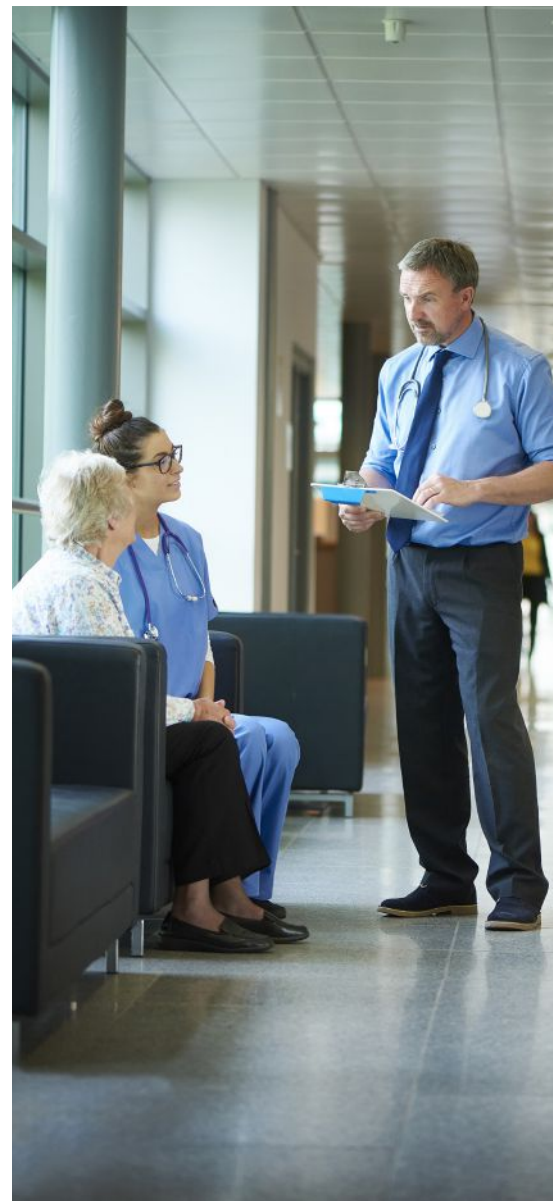
Studies which measure the impact on health education can be carried out through observational studies or randomised control studies (RCTs). The latter ensures balance between the group of participants and prevents bias but there needs to be logic to it so that the study makes a difference and has an impact on health outcomes. Simply carrying out observational analysis lacks matching and comparable data as it is difficult to control the variables.

### **So where do we go from here?**

Measuring the outcomes of patient education is essential for determining its value and the broader impact on our communities. In order to measure the impact of education, both in terms of health improvements and retention of knowledge over time, we need to be able to analyse health outputs using large data sets.

These could be data from wearables, patient records or from patient-reported information. For example, by linking up electronic medical records with symptom trackers the data sets would be much larger, giving a clearer picture of how they are impacting people.

Ultimately big data and digital technology can change the game by opening new avenues for modern healthcare and delivering true value for the health outcomes patients experience.



# Patient Pathway Reform:

## Addressing Current & Future NHS Capacity Challenges

Mike Farrar, former CEO of the NHS Confederation and NHS Northwest Strategic Health Authority

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### Do Integrated Care Systems hold the key to widescale change?

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**T**oday, almost 6 million patients are on NHS waiting lists and estimates from the National Audit Office put that figure at near 12 million by 2025. In a new report, published by the cross-party Health and Social

Care Committee, MPs have warned that tackling the NHS backlog is an unquantifiable challenge stating that NHS staff are under pressure and could quit unless capacity can be increased to help deal with the pressures on the health service.

It is my view that government, advisers and policy makers, rather than NHS CEOs and Representative Bodies, must now openly acknowledge the pressures the service finds itself under. They should move swiftly to focus all their energy and effort on both

long-term workforce planning (and resourcing of course) and the actions needed to underpin our responses in the immediate term. By this I mean implementing policy options that enable transformational steps to the way that patients are managed at all key stages in their pathways of care. I would highlight the diagnostic and outpatient stage, which is ripe for reform through the application of new technologies and approaches at scale.

The service pressures are now monumental, as a consequence of COVID-19, but their origins, and the NHS' experience of them, are not new, nor insurmountable. The NHS was able to reduce waiting lists in the noughties to an unprecedented 18 week maximum, but then it had the benefit of supply side growth fuelled by large injections of money. This time, we don't have that luxury and so cannot expect more and more from a tired workforce - It's damaging for our healthcare workers own health, and it is detrimental to patient care. Instead, we must look elsewhere for solutions.

How to address capacity challenges whilst maintaining care services and protecting the wellbeing of the workforce?

We must use data more intelligently to prioritise care and stream patients according to need. Too often the prioritisation process is poor, and the pathways end with a hospital visit or stay. Yet, these are the very places that are creaking at their foundations and currently face increased pressure on the workforce due to COVID-related absences. We have to recognise that a hospital setting is not necessarily a pre-requisite to a more effective outpatient and/or diagnostic screening service.

Of course, we also must acknowledge that workforce and workload pressures are not insignificant in the primary, community and social sectors and so never has the mantra of 'manage the patient in the right place, at the right time, seen by the right person' been so important.

For this to happen we must re-consider how we prioritise patient referrals. How many patients would rather have their referral from the GP dealt with by a specialist consultant in days as opposed to weeks? How many would rather have that same appointment undertaken virtually, at their home, if it was safe to do so as opposed to travelling to the setting of care/the hospital? I would hazard a guess that it would be the majority.

Just as patients have, for the most part, embraced virtual GP appointments so that local services can be maintained, is it about time to start applying the same principles to outpatients and diagnostic services? Experience shows that this could alleviate pressures on staff, helping to reduce backlogs whilst at the same time, expediting and prioritising patient care.

### **A blueprint**

Consider the transformational approach the Isle of Wight NHS Trust took back in the summer 2021. The Trust was facing increasing patient backlogs and forecasted GP initiated referral activity of upwards of 27,000 patients per year because of the pandemic. Rather than doing the same - and getting the same result - the Trust undertook a proactive COVID-19 recovery programme.

The Trust's immediate priority was to identify a solution that could clinically assess and mitigate the risk for the backlog of patients awaiting an outpatient appointment, and where safe, discharge patients to primary care.

The Trust collaborated with a virtual hospital outpatient provider, to manage the clinical risk of closing outpatient services during the pandemic due to the



emergency reallocation of clinical staff. The Trust wanted to ensure patients requiring urgent intervention for non-COVID-19 presentations were recognised and managed appropriately and promptly.

In the first 8 months of the service there were: 5,800+ referrals, with the average new referral triage being 35 hours from when the patient was first referred by their GP. 47% of all referrals avoided an outpatient appointment at the hospital altogether; but more importantly 2.7% of patients were quickly upgraded onto 2 Week Waiting/Rapid Access Pathways.

The work undertaken at the Trust is now a blueprint for other offshore populations of the UK and Trusts across the UK who are all facing the same pressures on their workforce and outpatient services, which continue to be compounded by the ongoing COVID-19 crisis. But beyond COVID, it is a viable future proofed outpatient model that can support the transformation of the wider health economy throughout the UK.

### **A coordinated approach**

Right now, the Trusts across the UK are battling with the fall-out of the pandemic. Given this, there is little bandwidth in the hard-



pressed management and clinical community for changing systems and innovation, yet these are the solutions are essential to resolving these current operational challenges. As a consequence, there is a great opportunity, and I would argue imperative, now for a coordinated approach from ICS' or NHS England Regions to identify what solutions exist to help address these challenges and enable them to be deployed swiftly at scale.

### **Looking ahead**

Whilst the pandemic has compounded waiting times, it has highlighted a challenge that has long persisted. One that has been caused by consistent staffing and funding pressures, and pathways that often direct patients into the exact environment that is under the most intense pressure.

There must be another way and the time to act is now. Technology, alongside a

modern transformational mindset to patient pathways and care delivery, has to be at the forefront of addressing waiting lists, expediting patient care and relieving pressures on the healthcare workforce. And in truth, if we fail to deploy these immediate term technological changes, our longer-term workforce planning will be inaccurate, unaffordable and ineffective.

# The next generation of midwives & health visitors

*A new report suggests perinatal mental health training for midwives and health visitors would be beneficial and cost effective. But could we go further?*

**Dr Jess Heron**, Senior Research Fellow in Perinatal Psychiatry at the University of Birmingham and Chief Executive of national mental health charity Action on Postpartum Psychosis

**Dr Sally Wilson**, National Training and Research Coordinator, Action on Postpartum Psychosis

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**W**hen resources are stretched, specialist training, such as perinatal mental health training, might seem a luxury. However, as a report from the Maternal Mental Health Alliance illustrated this month, investment in specialist perinatal mental health

training for midwives and health visitors could save the NHS up to £52 million over the next ten years.

But could we save even more if we go further? There are many other health and public service professionals on the perinatal frontline - supporting women and families as they enter this most crucial stage in life.

Postpartum psychosis is a debilitating mental illness that affects around 1400 women and their families each year in the UK. It is a medical emergency and rapid admission to a Mother and Baby Unit is usually necessary to ensure the safety of both mother and baby. Around 50% of women affected have no previous history of mental health problems. Since the illness isn't widely understood, women are often misdiagnosed with postnatal depression, or experience less than optimal pathways to care. Delays in receiving appropriate care cause delays in recovery, risk the safety of the family unit, and increase the burden upon our health, social and emergency services.

Postpartum psychosis (which, put simply, is the development of acute mania or psychosis in the days or weeks following childbirth) cannot remain a specialist subject confined to the training rooms of perinatal psychiatrists. We need to acknowledge the importance of the entire patient journey and prioritise early interventions for women and families. All frontline health professionals have a role to play in identifying early symptoms and those at risk. Cross-department access to evidence-based and patient-centred training is essential and will save money in the long run.

Women who experience postpartum psychosis are often frightened, confused, uncertain what is happening to them. Symptoms wax and wane from moment to moment. Delusions and odd behaviour may be followed by periods of lucidity. High mood, grandiosity, irritability, depression, perplexity, paranoia, anxiety or fear may dominate the clinical picture. Postnatal depression (PND) might sometimes be diagnosed – the common treatment for which (antidepressants) can significantly worsen symptoms of postpartum psychosis. Sometimes symptoms might be misread as stress, tiredness or ‘baby blues’. But once the family hits crisis point, emergency services and urgent action is required to access the right course of treatment as quickly as possible.

Clearly, if women, families and front-line professionals were aware of postpartum psychosis and its best practice management, then we lessen both risk and burden. Curiously PND and other physical health risks are often discussed in antenatal classes yet postpartum psychosis rarely is.

However, so many of these health touchpoints in the perinatal period are not with ‘specialist’ perinatal mental health professionals. It is

in the routine contacts that we miss opportunities for good management and cost saving.

Nursing staff, midwives, health visitors, GPs, A&E and ambulance staff report low confidence in identifying and managing new mothers with postpartum psychosis. Many report lack of funding and time to attend perinatal mental health training. Yet these are the very professionals that women and their families come into contact with when they need emergency help and advice.

Currently, at Action on Postpartum Psychosis, we are commissioned by NHS trust departments to deliver training to Mother and Baby Unit staff and perinatal mental health teams. What is clear from the findings of the MMHA report, is that the minimal costs involved in introducing more health professionals to our training sessions – would result in many cost savings, if viewed from a Trust perspective rather than a Department one.

Well-trained frontline professionals, who feel confident in talking about postpartum psychosis to women and families at routine appointments could save multiple trips to the GP, as well as anxiety and trauma to partners who have to call

upon all their negotiation skills to persuade a fearful or delusional new mother to attend a GP appointment or visit A&E. Pathways to care too often include multiple attempts by partners to seek help, missed opportunities, A&E visits and police involvement.

Raising awareness of postpartum psychosis amongst the general public is paramount, but swift interventions by health services can dramatically transform outcomes and save lives. Suicide is the leading cause of death to women in the 12 months after childbirth. Postpartum psychosis, an eminently treatable condition, accounts for a large proportion of these.

If we put ourselves in the shoes of women and families experiencing perinatal mental health problems and walk their journey through the perinatal period, it is these frontline professionals that we should be targeting with our training budgets – in the knowledge that, not only will it give women a better experience and better chance of recovery, but it will also, ultimately, save the NHS time and money.



# The need to urgently tackle less survivable cancers

Anna Jewell, Director of Support, Research & Influencing at Pancreatic Cancer UK

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**T**he Health Secretary has declared ‘war on cancer’ and it’s warranted – half of us will get cancer at some point in our lifetimes and the UK lags woefully behind in survival outcomes. But does he have the right targets in his sights?

More than half of people diagnosed with cancer will survive for 10 years or more, so often we no longer assume it’s a death sentence. But for the deadliest common cancer – pancreatic cancer – this is sadly not the case.

More than 50% of people will die within three months; 75% within a year: appalling statistics that have barely shifted in decades.

To win we need to ensure this war is targeted, not scattergun. Pancreatic and other less survivable cancers need to be the lynchpin of any future plan from the outset. Otherwise, we risk widening the already stark survival gap, failing to meet the NHS’ own targets, and pancreatic cancer continuing to be one of the most dreaded diagnoses.

We need to level up the system for people with pancreatic cancer. The NHS aims for 75% of all people with cancer to be diagnosed at an early stage, but for pancreatic cancer, only 20% of people are currently diagnosed at stage one and two – where potentially curative surgery is possible. We need to find better ways to get those with alarming symptoms referred for investigation as people attend their GP an average of three times before referral. That’s three missed opportunities for earlier diagnosis. ↻



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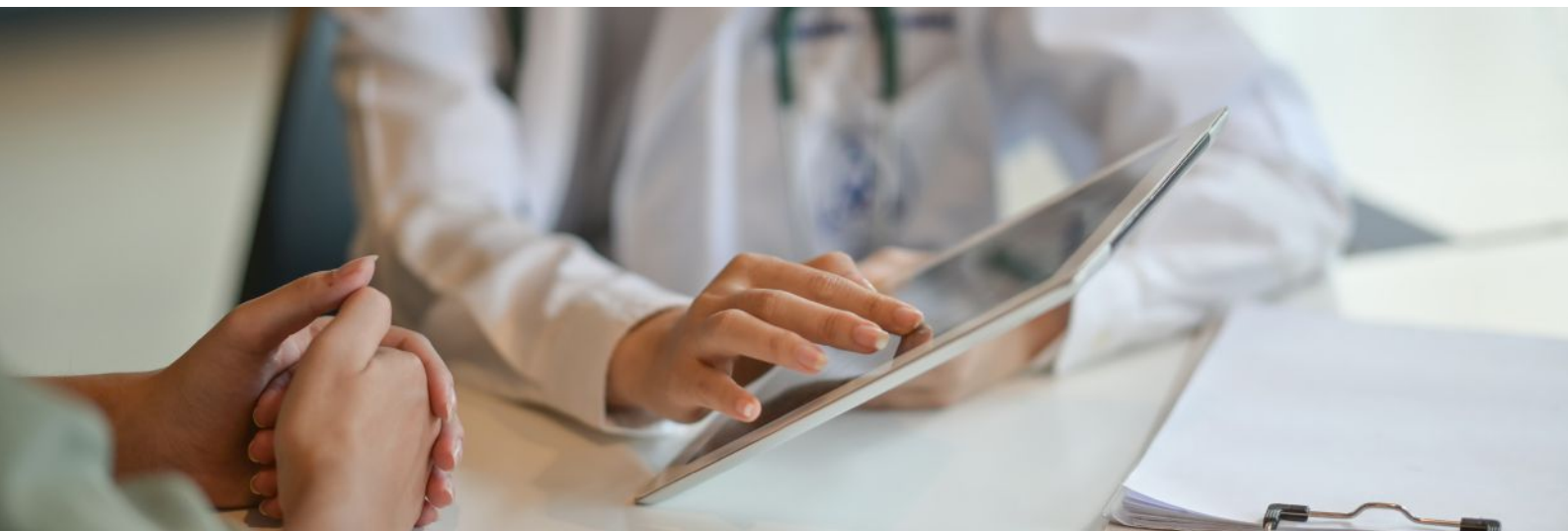
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We see too much variation in people's experience of receiving a diagnosis and accessing treatment fast. To combat this, Pancreatic Cancer UK are creating an Optimal Care Pathway that, if adopted, will ensure consistency and quality of treatment. Everyone, from doctors and nurses to patients and their families, must know what to expect and what should happen the moment someone presents with symptoms, throughout their treatment and, if necessary, during palliative care.

Data is a key weapon in our armoury for making change happen, but we need more of it and better quality. Currently, data on pancreatic cancer is usually grouped with other cancer types denying us a clear picture of patients' experiences. Without this intelligence we can't take decisive action to improve treatment, care and survival. Collecting and publishing quality, disaggregated

data would be a simple yet incredibly effective line of attack on this and other cancers.


Undoubtedly this war has many fronts and we need concerted action across them. Without targeted research we'll remain where we are for decades to come. Pancreatic cancer receives a fraction of the funding of cancers with similar case numbers, such as leukaemia (which has received four times more investment since 2002). This has created a precarious research environment for the disease, failing to attract new candidates to the field and providing insufficient security for those it does. Researchers are inadvertently discouraged from undertaking innovative projects – which are vital if we are to make desperately needed breakthroughs.

It's bad enough that research has long been neglected. But worse, the weapons we do have available aren't used

properly. Pancreatic Enzyme Replacement Therapy (PERT) is an essential tablet for people with pancreatic cancer. It does the crucial job of allowing people to absorb nutrients from their food, without which they begin to starve to death. Yet shockingly, only half of people with this cancer are being prescribed PERT. This is low-hanging fruit. It's a proven, cost-effective solution to incredibly distressing nutritional symptoms. So why aren't we using it?

The answer is indicative of a wider problem in our approach to pancreatic cancer. Too often, people are simply being written off. The deadliest common cancer is viewed as just that – deadly – and there is not enough political will to change this story.

Improving the outcomes of specific cancers is possible. Over 20 years, lung cancer has seen a succession



of national government and clinical initiatives that have been transformative, more than doubling five-year survival from 7% to 16%. Four years ago, the Government announced the Tessa Jowell Brain Cancer Research Mission, which set aside £40m investment into brain cancer research. These actions prove that, where there is political will, governments can set a positive strategic direction for cancers that have been historically neglected.

We can achieve this victory for pancreatic cancer too, if we plan our war with focus. Strategies that approach cancers with a broad brush, failing to address their individual issues will not deliver the far-reaching progress we desperately need. By listening to people with cancer, charities, and the clinical community – and acting on their advice – the potential is there to make the next decade a truly historic one in transforming cancer survival. But words must be matched with urgency, infrastructure, and crucially funding. The thousands of people affected by the deadliest common cancer annually deserve more than simply a return to the pre-pandemic status quo.

# Security and Parking:

## Keeping NHS staff and patients safe

 Northwick Park Hospital Car Park  
Staff Only Parking  
Restricted Access - Authorised Cars Only  
Height Restriction - Maximum 2.2m

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**Kim Challis**, APCOA Regional Managing Director UK&I and Group ESG Director

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**Graham Tidball**, APCOA Director of Commercial Parking Services

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**Ron Gregory**, Security Manager, Hull University Teaching Hospitals NHS Trust

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Patients' hospital experiences do not occur in isolation. For many, their first and last interactions with an NHS trust during their visit come outside of the hospital building, in the car park. Just like inside the walls of the hospital too, there are a number of key considerations which have to be made to ensure the smooth operation of the hospital. This includes appropriate information being made available, effective management of the flow of traffic, and increasingly in recent times the ability to introduce digital technologies. Having security officers with the ability to manage difficult situations and maintain public safety in a way that reflects the sensitive environment is also key.

While they might not always jump to the forefront of people's minds, effective and efficient management of hospital car parking and security can have positive impacts for NHS trusts, staff and patients alike.

To better understand these opportunities, National Health Executive sat down with Kim Challis and Graham Tidball of APCOA. In this article, we're looking at APCOA's role in keeping NHS staff and patients safe, and in the next issue we'll be exploring innovation in NHS parking and security.

As Kim explains: "For many people, parking management is what APCOA is known for. But over the last 12 years or so we have developed our skillsets and our security management services suite

too. We have invested in our own technologies, systems and security personnel, which have helped further that expertise - not just to deliver traditional services but also to provide innovative, flexible solutions to some of the common challenges facing trusts in managing healthcare estates.

"These solutions include the provision of ANPR technology combined with convenient customer payment options such as cashless payment via App or credit/debit card, autopay and late pay, as well as complex integrated permit solutions for both staff and blue badge customers. As a result, we now manage security and parking for many NHS and healthcare client sites across the UK including Royal Stoke, St Mary's Isle of Wight and Walsall Manor hospitals. ↻





“However, we’re seeing budgets becoming tighter, especially in the local government and health sectors, and therefore we have to work to deliver things more efficiently and effectively. You can only deliver that efficiency through integrated services and combining the two parts of the proposition – people and technology – and this is where our core expertise comes into play.”

Graham adds: “No single trust has the same characteristics as another,

even on its doorstep. Therefore we cannot treat parking or security needs as the same for all. The ability to deliver a blend of combined security and parking together allows us to pitch a strong proposition no matter which service requirement is most prominent.”

Kim comments: “Providing effective security within sensitive and challenging health care environments requires much more than following procedures. It’s about working as one team

and treating everyone – staff, patients, visitors – with respect. We see the role of our security officers as one of customer service, helping and guiding people as well as maintaining safety and delivering safe, appropriate escalation procedures for patients with challenging behaviours.

“APCOA developed a range of bespoke training and development programmes and got those systems and skillsets accredited, which is important - in the NHS, you can’t do anything

**“We wanted to not just do the basics but continue to develop our staff.”**



without the appropriate accreditation behind you. As a company, we are also accredited as Gold-level Investors in People, and our training is backed up by strong health and safety procedures, incident management and a culture of proactive improvement.

All APCOA's 400+ security officers who specialise in the NHS are recognised by ACS Pacesetters as being in the top 5% of SIA-accredited companies. Graham says: “Not only do we talk about the good stuff but placing patients

and colleagues at the heart of what we do, day in, day out, is ingrained in our DNA.”

And that confidence in their security offering is not just within APCOA. Speaking with Ron Gregory, Security Manager at Hull University Teaching Hospitals NHS Trust, one of the trusts using APCOA's services, he explains: “We've got a combined security and parking contract [with APCOA] that is predominantly security with parking bolted on.

“Since they came in, there was a lot of modernisation to be done.

“When they took over, they moved some of the positions that we have on-site around, so we opened up a CCTV control room at our secondary Castle Hill site. We didn't have that before.

“And I suppose the biggest thing that they've changed, or we've done collectively – because we do very much view it as a partnership – is that they took over the part of the specification around training and the competency matrix for all of the staff.

“What we had previously was staff who had the competencies they needed. They had the security industry authority license. But that's all they were going to have.

“We made sure, on this contract, we engaged with our internal stakeholders to

look at what the staff need to deliver. And we put that into a quite comprehensive training matrix.

“[It allowed us to] put various things in place. We began to use the apprenticeship levy, and we were very keen to develop the staff from within. For all of the security supervisors, we wrote into their contract that they need to do their security first line manager apprenticeship or have been enrolled on it within three months of starting, while the contract manager on site needed to have level five leadership management or equivalent.

“We wanted to not just do the basics but continue to develop our staff.”

This partnership at Hull, comprising directly employed NHS staff and contracted staff from APCOA, was recently recognised as ‘Healthcare Security Team of the Year’ by the National Association for Healthcare Security (NAHS).

Kim concludes: “One essential element of APCOA's partnership approach is that our colleagues are seen as ambassadors for our clients, and I'm really proud that is the case.”

A blue-tinted photograph of three healthcare professionals (two men and one woman) in a meeting, looking at a document. The man in the center has a stethoscope around his neck. The woman on the right has curly hair and glasses. The background is a blurred office setting.

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# The need to establish more robust pharma supply chains for future preparedness

**Matt Roberts**, Editor, National Health Executive

*featuring comment by*

**Dr Michelle McMurry-Heath**, President & CEO of the Biotechnology Innovation Organisation

**Rajinder Suri**, CEO at the Developing Countries Vaccine Manufacturers Network (DCVMN)

**Steve Bates OBE**, Chief Executive at the BioIndustry Association.

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**O**ur healthcare and pharmaceutical industries faced a huge challenge during the pandemic. From a near standing start, they had to innovate and adapt to establish new supply routes and reinforce existing

partnerships, all in the face of a hugely disruptive, global pandemic. Now, two years later, we're seeing the world emerge out the other side of the Covid-19 virus, fuelled by life-saving vaccines and fast-paced, collaborative health research, and it is a time to reflect on and learn.

Developing and delivering these vast national vaccine drives around the world has taken immense collaboration from all sides of the drug supply chain, from research and academia through to manufacturing and logistics experts. ➔

Spurred on by the speed at which successful Covid-19 vaccines were developed – years ahead of the usual timeframes for new medicines development – leaders from across are set to meet to share learning and experiences.

It is hoped that by building and maintaining these close professional relationships, the industry will be able to foster the development of new vaccines within 100 days of a future pandemic being identified, as well as ensuring the fair and equitable distribution of these vaccines around the world.

This includes efforts from the Coalition for Epidemic Preparedness Innovations (CEPI) to replenish its fundraising target to support ambitious initiatives to reduce the risk of future pandemics and epidemics. This will include the continued close working of organisations like CEPI and the biopharmaceutical industry.

With two years' experience now under their belts, it is now the time for the industry to reflect and transform the lessons learned during the pandemic into tangible and sustainable pandemic preparedness solutions.

This will involve building agile and responsive health system structures,

ensuring the health and pharmaceutical industries are as prepared as possible to respond to the next global public health crisis.

Dr Michelle McMurry-Heath, President and CEO, the Biotechnology Innovation Organization, said: “The Covid-19 virus has reinforced the importance of a robust and functional vaccine ecosystem.

“We’ve witnessed first-hand over the last two years the power of strong collaboration between academia, small and large biotech companies, regulatory officials, and manufacturing sectors – all in record time.

“Supporting partners like CEPI, along with other NGOs, are crucial to ensuring rapid and equitable access to vaccines on every corner of the globe.

“We look forward to collaborating with CEPI in their effort to fully replenish funds to boost pandemic preparedness and vaccine access to save lives”.

To supercharge that collaboration, manufacturing and research have had to co-work much more closely, with every innovation and efficiency achieved in one area of the industry having a positive impact on the rest.

All of this was enshrined in an agreement by the G7 nations in June 2021, and in the subsequent 100 Days Mission report.

To continue contributing and seeking to improve how we collectively respond to future pandemics the vaccine manufacturers in the developing and the developed world, and the biotech and biopharmaceutical industry more broadly commits to:

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Investing in research and development on target pathogens with epidemic and pandemic potential and to build a portfolio of promising candidate vaccines, treatments and technologies.

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Working to reduce manufacturing complexities and developing new manufacturing methods to adapt and quickly expand manufacturing capacity for new vaccines to address future public health emergencies.

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Contributing to a strengthened global clinical trial infrastructure by producing high-quality evidence on the efficacy and safety of our products, both prior to and during pandemic conditions, and maintaining the highest levels of quality and ethical standards, transparency and accountability.

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Steve Bates OBE, Chief Executive at the BiIndustry Association, said: “The UK’s experience of true partnership working between government, science, academia and industry embodied in the Vaccines Taskforce enabled lightning speed progress in developing vaccines and therapeutics for this pandemic.

“As the UK hosts this key global event, we both offer our practical expertise in what worked well to colleagues from around the world and

seek to learn, partner and prepare better for the future”.

Rajinder Suri, CEO at the Developing Countries Vaccine Manufacturers Network (DCVMN), added: “During the past two years we have witnessed an unprecedented global collaboration, advances in science and technology, regulatory flexibilities and manufacturing at risk, which made it possible to develop and roll-out the COVID-19 vaccines in record time.

“The continued all round presence and support of CEPI right from identification of partners to development, scaling up and scaling out of vaccines has been critical success factor.

“We at DCVMN strongly believe that Mission 100 Days would turn out to be a pathbreaking step in the preparedness for any future pandemic”.



# Delivering a sustainable, resilient & green NHS

Martin Toomey, Sustainability Manager, NHS Supply Chain

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**N**HS Supply Chain has a crucial role in delivering a greener NHS that is both sustainable and resilient.

Led by the government's Net Zero Strategy and the NHS Net Zero Report that commits to being Net Zero by 2045, NHS Supply Chain has committed to ensuring our Delivering Health Sustainably Strategy makes a tangible impact and that our work with suppliers creates a definitive transition to a green and sustainable future.

Martin Toomey, NHS Supply Chain's Sustainability Manager, explains: 'We work with suppliers to provide high-quality care – from the

provision of nutritious food and world-class medical equipment, to safe and secure healthcare supplies for all trusts. It's our role to deliver this through a sustainable supply chain set against the NHS Net Zero Supplier Roadmap, which charts a route towards a net zero healthcare system and lays out a process for collaboration over the coming years.'

By the end of the decade, the NHS will no longer purchase from suppliers that have not aligned with our trajectory towards net zero carbon. From 1st April 2022, all trusts must adopt the Government's Social Value Model (PPN 06/20), by including a minimum of 10% weighting on net zero and social value in all tenders.

Martin adds: 'We recognise the value that becoming greener can offer and are working to decarbonise our operations. In addition, we are committed to working in collaboration with suppliers to resolve roadblocks along the way and realise a healthier, low-carbon future.'

## Our Pledge

NHS Supply Chain committed to specific actions that we will take to deliver Net Zero. This pledge to achieving Net Zero showcases our collective support and action across the health and care sector.

**Our commitments are as follows:**

NHS Supply chain will promote and champion hybrid working, using technology as our standard solution for working with all stakeholders

NHS Supply chain will reduce our direct CO2 emissions, eliminate single-use plastics (where possible) and reduce all packaging used in our operations.

NHS Supply chain will champion the supply of environmentally sustainable products and services to the NHS, including these requirements in all future tenders.

As part of NHS Supply Chain's commitment to sustainability, supplying trusts with the right tools to reduce waste is a significant priority.

We are excited to announce the launch of a brand new Reusable Clinical Waste Containers framework, which became available for trusts in January 2022. This framework

is for the provision of the full end-to-end service, which can be amended to suit trust requirements, on a direct basis agreed upon between supplier and customer.

**The aim of this sustainable initiative is to:**

Offer a new framework for the provision of a reusable sharps and clinical waste containers' service as an alternative for customers to consider to the established single-use sharps and clinical waste container consumable products.

Support the NHS net zero plan to eliminate all single-use plastic within the next 10 years.

Giving trusts the option to make a sustainable choice that is better for the environment and could reduce SUP and CO2 emissions.

Financial savings that may be achieved when switching to the reusable service. The nature of the service creates a circular economy by utilising reusable clinical waste containers that can be used up to 500 times before disposal.

'We are confident that customers using the framework will see a significant reduction in single use plastic and CO2 emissions, helping them towards their

sustainability targets, as well as seeing potential for financial savings across the entire waste management service. This framework also means that there will be a

wider variety of options for customers to choose from for their waste management products and services.'

[CLICK HERE TO VIEW THE SOCIAL VALUE MODEL](#)



# Streamlining access to innovative stroke imagery analysis technology

**Matt Roberts**, Editor,  
National Health Executive

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*featuring comment by* **Darrien Bold**, National Digital and AI Lead for Stroke at NHS England and NHS Improvement (NHSE/I) & **Adam Nickerson**, Senior Category Manager – Digital & IT at NHS Shared Business Services (NHS SBS)

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[CLICK HERE TO READ ARTICLE](#)



The use of artificial intelligence in the analysis of stroke imagery can make significant differences in providing rapid treatment where required for patients undergoing an ischaemic or haemorrhagic stroke. But where do healthcare organisations start when looking to procure these innovation AI technologies?

NHS Shared Business Services (NHS SBS) have looked to streamline that process, unveiling their new procurement framework to enable NHS organisations

to have access to this evidence-based, cost-effective technology.

The new 'Provision of AI Software in Neuroscience for Stroke Decision Making Support' framework is the only, one of its kind framework in the UK specifically for the analysis of this type of stroke imagery.

As an emerging marketplace, there can be challenges to contracting with some of the most innovative tech start-ups, with the new procurement framework agreement aiming to remove some of

these barriers and de-risk the process, providing NHS organisations with a more viable commercial solution – and offering the necessary assurances to buyers.

The new framework agreement has been developed alongside expert contributions from NHS England and NHS Improvement (NHSE/I), clinical leaders from the 20 Integrated Stroke Delivery Networks across England, the Academic Health Science Network and with further input from NHSX and the Care Quality Commission (CQC).

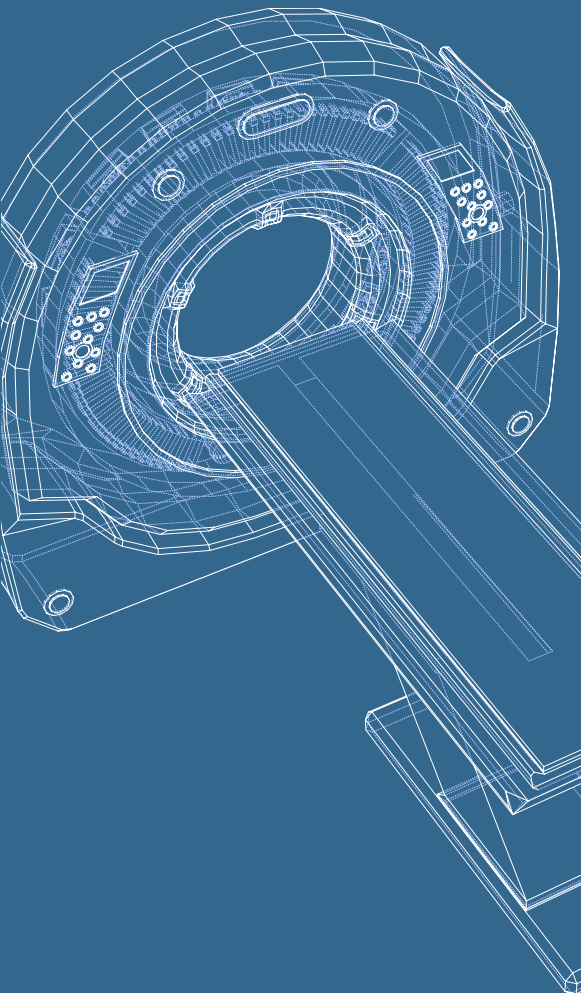
[CLICK HERE TO READ THE AI FOR STROKE FRAMEWORK](#)



## But why does it matter?

In the UK alone, each year over 100,000 people are affected by stroke, according to research by The Stroke Association.

As a time-sensitive condition, speed and accuracy in interpreting brain scans is critical to the diagnosis and treatment of ischaemic and haemorrhagic stroke. Image analysis software can use AI algorithms to support the clinical decision-making process by providing real-time interpretation of imaging and scans, augmenting the review, diagnosis and delivery of these time-sensitive treatments.



Improving services and outcomes for stroke patients was a key objective outlined in the NHS Long Term Plan.

This included a ten-fold increase in the proportion of patients receiving a thrombectomy after a stroke by 2022. Achieving this increased level is expected to mean 1,600 more people can live independently after their stroke each year.

Under the NHS Long Term Plan ambitions, the NHS also aims to have the best performance in Europe for delivering thrombolysis to all suitable patients by 2025.

## The relationship between imagery and AI

The stroke care milestones outlined also include the scaling up of technology to drive expansions in life-saving treatments.

This includes the use of AI interpretation of CT and MRI scans regarding the suitability for thrombolysis and thrombectomy, though always as a supporting tool to clinical decisions.

Using AI solutions can reduce the decision-making time for both thrombolysis and thrombectomy, increasing the



number of patients eligible for both interventions and improving the likely benefit of treatment.

When manual reviewing of brain scan imagery is undertaken remotely by a reporting doctor, it can take up to 30 minutes for a decision – according to data from NHS England’s Diagnostics: Recovery and Renewal Report.

By comparison, an AI tool can provide interpretation of imagery within seconds.

The use of AI software has also been included as an integral part of the National Optimal Stroke Imaging Pathway (NOSIP), where it is designed to guide the efficient use of radiology resources and reduce duplication. Under NOSIP, the need for rapid acquisition and interpretation

of appropriate brain and vessel imaging is prioritised during the initial assessment when a stroke is suspected in a patient.

AI solutions form a key part of achieving this rapid interpretation of the imaging, though being used prominently as a decision support – rather than as a substitute for expert radiological interpretation.

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The NHS England Diagnostics report also highlighted AI as being of a significant benefit to improving access to both thrombolytic therapy and mechanical thrombectomy in England.

The new NHS SBS framework is seen as an important mechanism in supporting NHS trusts and networks to be able to access these AI solutions and deliver optimal pathways for patients where a stroke is suspected.

Darrien Bold, National Digital and AI Lead for Stroke at NHS England and NHS Improvement (NHSE/I) said: “We are already seeing the impact AI decision-support software is having on stroke pathways across the country, and the introduction of this framework will drive forward further progress in delivering best-practice care where rapid assessment and treatment are of the essence.

“Over the past 18 months, the health and care system has been compelled to look to new technologies to continue providing frontline care, and the stroke community has embraced new ways of working in times of unprecedented pressure. This framework agreement will be of great benefit as we implement the NOSIP - driving better outcomes, better patient

experience and better patient safety, using new technology quickly, safely and innovatively.”

Adam Nickerson, Senior Category Manager – Digital & IT at NHS SBS added: “This use of AI is a prime example of how new technologies have the potential to transform NHS patient care, speeding up diagnosis and treatment times by ensuring that expert clinical resource is targeted where it has the greatest impact for the patient. By identifying areas in which technology can be used to help speed up patient pathways, clinicians have more time for providing personalised care and patient waiting lists – exacerbated by the pandemic, are reduced.

“We have been pleased to work alongside some of the country’s leading tech minds, expert stroke clinicians, and policy leaders to develop this unique framework, which will go a long way to enabling more rapid uptake of Stroke AI software across the NHS.

“The suppliers on our framework agreement are working right at the cutting edge of healthcare. Their work is already improving and saving the lives of patients who – as a result of this digital healthcare technology – are given access to the right treatment more quickly.

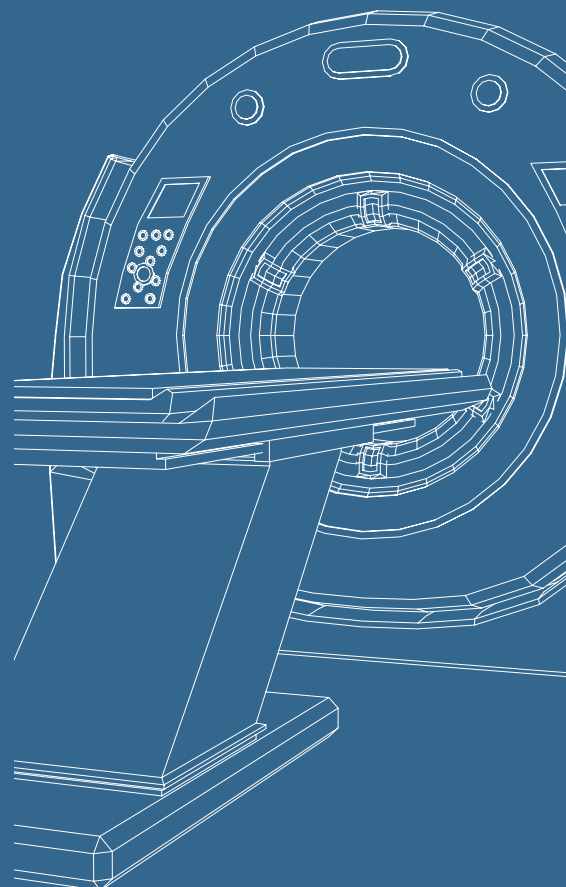
“We look forward to seeing how the technology evolves and the potential for equally life-saving solutions for patients with other medical conditions.”

The new NHS SBS procurement framework agreement offers a compliant route to market for all NHS and public sector organisations for a range of services around AI software and the analysis of stroke imagery.

It will run across an initial four-year period, from February 18, 2022, through to February 17, 2026.



**FIND OUT MORE  
ABOUT THE  
FRAMEWORK HERE.**



# Social Value: The impact on the NHS supply chain

Saskia Hicking, Lead Journalist, National Health Executive

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*In October 2020, the NHS set out its roadmap to becoming net-zero by 2045, taking into consideration the impact caused by each area of the NHS from patients to production to procurement.*



According to Greener NHS, 60 percent of the overall NHS carbon footprint is caused by the NHS supply chain, with more than 80,000 suppliers contributing to this in order to keep supply of drugs, food, medical equipment and more.

Whilst the NHS are doing all they can to improve their output and reduce their carbon emissions, suppliers are not yet in line with the health organisation and are still contributing a huge percentage to the NHS carbon footprint.

In order to align suppliers with the NHS' net-zero ambitions the NHS England Public Board have approved a roadmap which has set a standard that suppliers entering into a framework should adhere to help achieve this goal.

Below is the roadmap which is in addition to the UK Governments procurement policy:

Next month (April 2022), the NHS will adopt the Governments Social Value Model where new and existing NHS tenders will have to include a minimum of 10 percent scoring criteria in all procurements in order

to remain or become an NHS supplier. The criteria will allow the NHS to see how much a supplier would be contributing towards the NHS' net zero targets and social value.

Within the government's Social Value Model there are five themes: COVID-19 recovery, tackling economic inequality, fighting climate change, equal opportunity and wellbeing.

Suppliers must complete a Model Evaluation Overview which will describe the organisations commitment to ensuring the contract delivers the themes set out in the Social Value Model.

### COVID-19 Recovery:

When looking at new contracts the Government will consider the number of relevant outputs such as how it impacts the economy and local communities through factors like employment, re-training and return to work opportunities.

Contracts should look to outline how they will tackle high unemployment rates that have been caused by COVID-19 and how they could help to reduce this.

In addition, mental health, social distancing measures and remote working options are all also factors which new and existing contracts will be assessed upon.



**CLICK HERE TO READ THE FULL SOCIAL VALUE MODEL.**

### Tackling economic inequality:

The Government will assess contracting authorities and ask them to report the number of full-time equivalent jobs and traineeship opportunities that will be created through their contracts.

This theme will also look to address any skill gaps that present themselves in the local area, particularly in technical skills such as in the construction industry.

### Fighting climate change:

This theme will fall in line with the Government's 25 Year Environment Plan, which sets out goals for improving the environment and how we can work with communities and businesses to achieve this.

### Equal Opportunity:

The Government have set an aim to see one million more disabled people in work over the next ten years. This strategy looks to reduce the disability employment gap by ensuring a diverse and inclusive workforce to reflect

the customers it serves and the community in which it is based.

Contractors must outline how likely under-representation may be within the workforce and if there are equal opportunities for employment of people with disabilities.

### Wellbeing:

In partnership with Mind, the Government have created the Mental Health at Work website which includes resources to help both employers and employees address mental health within the workplace.

Progress under this policy will be monitored by the proportion of suppliers in the contract supply chain who have implemented measures to improve the health and wellbeing of employees.



**YOU CAN SEE A FULL LIST OF THE PRIORITIES, POLICY OUTCOMES, MODEL AWARD CRITERIA AND REPORTING METRICS LISTED IN THE SOCIAL VALUE MODEL HERE.**

# Digital

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Trust in technology requires visibility

Katherine Saunders

# Tackling health inequalities in rural and coastal areas

By **Patrick Mitchell**, Director of Innovation, Digital and Transformation at HEE

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A combination of worsening health, ageing populations, social deprivation and workforce staffing issues are leaving health and care services in rural and coastal areas facing serious challenges.

Services are having to meet the needs of populations with deteriorating health and range of significant physical and mental health conditions, while also trying to address staffing shortages in key disciplines.

That's why, here at Health Education England, we have unveiled plans for a new programme aiming to help tackle health inequalities in these locations – and enable agencies to work together

to find a range of solutions. These plans, based on global evidence, set out an ambition to help reduce ill health and inequalities through education, training and use of digital technology.

There is a whole range of research and data that illustrates the extent of the problem, and the impact it is having on the populations of these areas of the country. Indeed, in February the findings of a three-year parliamentary inquiry by the All-Party Parliamentary Group (APPG) for Rural Health and Care and the National Centre for Rural Health and Care revealed an urban-rural divide in accessing healthcare.

And last year, Chief Medical Officer Sir Chris Whitty warned in his Annual Report

2021 that “there will be a long tail of preventable ill health which will get worse as current populations age”, if the problem is not addressed “vigorously and systematically”.

This is not just an issue that affects small pockets of England – it is a national challenge that is being experienced by swathes of the population. It is therefore vital that we look at ways that HEE can work with partners throughout the country, across multiple education and training programmes, in a targeted way.

Under the plans, HEE will launch evidence-based pilots in selected Integrated Care Systems (ICSs) having similar problems attracting, recruiting, and retaining a workforce needed in the face of growing demand. ↻

These would be designed on a mix of existing proven interventions but be anchored around some key initiatives that internationally have been proven to be effective in sustaining a local community's recruitment and retention of health professionals.

The ultimate aims in these areas will be to improve patients' access to services, the quality of clinical services they receive and the outcomes they achieve.



We know that rural communities tend to have older populations than urban areas. The Rural Urban Classification found the most prominent age groups in rural areas were 50-54 years and 55-59 years, compared to 25-29 and 30-34 in urban areas. With that comes worse health and a greater need for health and care services, while access to these services is often poorer than in urban settings.

Therefore, HEE's plans focus on three key pieces of work:

Widening participation and access to medical schools, with ambition to increase applications from rural communities

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Innovative rural and coastal healthcare apprenticeship programmes.

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Initiatives focused on increasing digital and health literacy (the ability to access, assess and use health information) among members of the public, such as Digital Ambassadors.

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HEE's regional teams will work in collaboration with the ICS pilot areas, supported by HEE's national teams as appropriate, to establish a targeted and sustained programme of education and training.

HEE will work closely with ICS colleagues to utilise existing HEE activity - such as the Medical Education Reform Programme and the Dental Education Reform Programme - and tailor them to the needs of each population.

A key element of this will be working with local teams who have knowledge of the context and specific issues of those areas to fully understand the health and workforce issues. This will then enable us to focus our work on ensuring trainees develop a broad range of skills needed for rural and coastal practice.

It is also vital to develop residents' digital skills and confidence to enable them to access help and information in a variety of ways, and make the most of technology available in the NHS. In our digital age, health literacy needs to be underpinned by digital skills, so that people can find and evaluate information online as well as access digital health services. This is even more important as healthcare appointments move online.



A number of ICSs have already trialled innovative projects including training local residents to use online services and appointing Digital Ambassadors in the workforce and community to promote the importance of digital skills.

Meanwhile, HEE will also develop solutions to secure the workforce by learning from global research - particularly the importance of a rural upbringing; positive undergraduate clinical and educational experiences in rural settings; and targeted training for rural practice at postgraduate level. While the work will be place-based at a regional level, HEE will take good practice and learning to inform future investment and direction.

Addressing longstanding inequalities requires a new vision for professional practice in rural and coastal areas which is locally distributed, community embedded and where education and learning leads to greater collaboration with other partners in health, care, local authorities, and communities.

It's not about devising a new way of working from scratch. Health inequalities in rural and coastal areas are not going to improve unless we find achievable ways to work together to target our resources at locations facing the biggest challenges - and that is what these plans set out to do.

# Calling time on stop gap solutions – why it's time to change the focus on digital

By Lord Victor Adebowale, chair of NHS Confed and member of the House of Lords

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**W**e all learnt pretty quickly during the pandemic that digital solutions can be used to provide a quick resolution to health and care delivery. Within weeks we saw technology platforms installed to help professionals and clinicians to respond in a proactive and effective way.

However, what COVID has also demonstrated, is that the introduction of rapid technology provides only temporary relief to the high-pressure health systems are facing, and, to sustain this momentum and provide long-term gain, we need a different approach to digital implementation. The 'stop-gap' solutions have led to many conversations about

whether digital can protect health and care from its gradual decline.

On its own, I do not believe it can. In order to be the redeemer, it needs the collaboration of all its stakeholders - clinicians, commissioners, innovators and patients. It also needs to deliver interventions in each part of the patient journey,



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providing opportunities for digital care, from one end to the other; it needs a sustainable and holistic solution – and one which puts people first.

### Shift the focus from acute care

Take brain injury, including stroke, as a case in point. Digital platforms in this pathway already have a proven track record on the acute end. This is not surprising as this is where the investment is – and always has been. There are excellent examples of high quality, clinical grade digital platforms supporting a virtual health and care system, at the acute phase of this pathway.

Over the last ten years, we have seen some real benefits in the East of England using digital solutions to deliver ischemic stroke treatment, therefore improving outcomes. Lives have been saved by having access to accurate diagnosis and treatment at the point of need and through smart ambulances to speed-up acute care.

But we really need to shift the focus and concentrate on designing and implementing digital interventions in other segments of the pathway. There is a massive digital opportunity to optimise

outcomes for people – especially in recovery – and provide a blueprint for other interventions to follow.

### Accelerate the recovery plan

Sadly, when we refer to the basic conversations we have had, it's very clear that treatment and recovery programmes are pretty inconsistent. This is apparent across the world and not just in the UK.

A report from the charity SameYou, captures and shares hundreds of real life stories and provides insight into people's experiences of recovery and rehabilitation following an acquired brain injury or stroke.

**CLICK HERE TO VIEW THE REPORT**



Their stories have shown that outcomes are much more positive for those with multiple interventions, including remote monitoring, access to therapies, centralised services in specialist units and peer-to-peer support.

We really should be showcasing those stories, to enhance the digital offer and accelerate the introduction of virtual rehabilitation platforms, which in turn will reduce the need for longer-term care. The savings could

be substantial, but more importantly, it could have a profound impact on people's lives.

Yet despite the evidence and efforts, we still seem to fall short.

With the initiation of 21 Integrated Stroke Delivery Networks (ISDN) in the UK, there is hope that there will be some co-ordination of innovations within and between the Integrated Care systems (ICS), to facilitate a sustainable cohesive response.

However, there is no evidence that this is starting to take shape anytime soon. In fact, the continued focus on Acute Stroke Units seems to reiterate the treadmill of investment in crisis management, rather than prevention and rehabilitation.

It was also hoped that the post-Covid learnings would re-ignite the ambitions of the NHS Long Term Plan, to improve post-hospital rehabilitation models – but again this is happening at a slow pace.

As innovators and influencers, we need to accelerate this plan.

By supporting people at home and providing earlier intervention we can help prevent deterioration,

particularly as people are faced with long waits for care. This in turn will reduce readmissions and exacerbation, but also reduces unnecessary low value follow-ups.

The benefits are therefore substantial; with a focus on health promotion and wellbeing and lifestyle optimisation, it will reduce demand on primary and community care as well as overall healthcare utilisation

And, what's more, the information captured can feed back into the overall pathway design in order change clinical practice and inform systems for future population health management.



### Closing the virtual circle

Integrated health and care delivery cuts across the whole system – bringing in both formal and informal care.

Our communities – including digital ones - can play a key role in lifestyle changes and choices. Prevention and recovery are not even a technology challenge, they are a societal one. Race, geography and politics have a huge effect on the possibility of suffering from long term conditions and access to treatment, however, we need to capture the data and information throughout the pathway in order to change that.

At the moment the data sets are not being passed on and do not discern between people from one end of



the pathway to the other, therefore a patient is not seen as the same person, rather as a different episode. This lack of integration often is the missing link to complete pathway design and needs to be addressed.

We should also be encouraging innovative strategies and technologies to detect and address physical and socio-economic risk factors for stroke, and the impact of health inequalities when managing high risk groups. Only then can we identify what interventions are high cost and high impact.

### **So where to from here?**

Firstly, we need a digital footprint to follow the patient, and focus on the whole person. If we have this, we will then see the shift and impacts on all other pathways.

By optimising the platforms we have and focusing on rapid treatment and effective recovery, we can build the evidence on prevention and contribute to the debate.

In addition, the advent of digitally enabled rehabilitation with patient centred care at its heart, can reduce the costs of rehabilitation hugely, and thus enable the NHS and care system to properly fund this element of the pathway.

By taking the lessons learned from the pandemic to speed up digital collaboration and to organisations to commission technology as part of a complete operating model, not as an addition to an existing model, we can truly make a difference. And it needs to be more than just in acute care, and with more than just clinicians.



It is time to shift focus and invest in people; helping them to be well and stay well. Digital can help - it can be lifesaving and life-changing in so many ways - but it can't do it alone.



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# Online consultation systems can reduce GP waiting times

How online consultation can improve patient care and reduce pressures in general practice

Ric Thompson, Managing Director, Advanced Health & Care

Online consultation (OC) systems can enable GP practices to conduct patient consultations entirely online, prioritise patients based on clinical need, and reduce their workload.

Online consultation software enables patients to contact their GP via their practice website, home computer or smartphone, which dramatically reduces the pressure on phone lines and reception teams as well as eliminating the need for most patients to attend the practice in person.

OC systems help patients with urgent requests to get through to their practice on the phone faster, while GPs can manage non-urgent requests online in their own time based on clinical priority. The triage and workflow functionality built into the systems enable practices to handle hundreds of requests simultaneously and signpost patients to the right care provider in real-time, thus reducing their workload. Patients who prefer in-person appointments also benefit because practice staff have more time to support them.



An important benefit of online consultations is that of communication. Patients who previously struggled to reach their GP practice by telephone or arrange in-person appointments can now communicate in their own time, and in multiple languages. The language translation functionality of online patient consultation systems can operate with up to 30 different languages, something of great benefit to patients with limited English-speaking skills.

OC software also has the advantage of being able to distribute messages via a variety of methods. Messages can be sent to individual patients in the form of a two-way communication or announcements can be sent out to thousands of patients in bulk. This mass communication function can be especially useful for distributing online questionnaires and conducting annual reviews.

Working in partnership with The University of Manchester and Spectra Analytics, Advanced has developed an online consultation solution for GP practices called PATCHS that not only handles large volumes of patients efficiently; it has been proven in some practices to reduce GP waiting times from three weeks to just three hours.

PATCHS is used in GP practices across England such as Langworthy Medical Practice in Salford. Dr Benjamin Brown, a GP Partner at Langworthy Medical Practice and researcher at The University of Manchester, comments: *“Since the start of the Covid-19 pandemic, all GP practices have been expected to provide online consultations. Unfortunately, a rush to adopt online consultation systems has left many GP practices with outdated solutions that are unable to deliver value. PATCHS is different, and has transformed the way we handle patient demand.”*

The Langworthy practice processes around 160 requests each day, for a population of 20,000 patients, and has reduced waiting times from three weeks to three hours on average.

*“In my practice, we used to have back-to-back appointments with patients but no effective triage procedures. Patients would often get face-to-face appointments when they didn’t need one, and everyone would get 10 minutes regardless of how simple or complex their problem. Now we spend most of our time communicating with patients via PATCHS, as 75% of consultations can be managed without*

*face-to-face, telephone or video contact. Most online consultations take anywhere from one to eight minutes, giving us time to spend helping patients with more complex problems.”*

There’s no doubt that the past couple of years has brought more than its fair share of challenges, but there have been silver linings. The last two years of the global pandemic have witnessed a rapid acceleration of investment and innovation in health tech across all care settings and at a scale no one could have imagined. Online consultation systems, such as PATCHS, are a great example of how health technology is transforming primary care across the UK.



# Machine learning outperforms clinical experts in classifying hip fractures

University of Bath

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*Neural networks shown to be better at identifying types of hip fracture, which could improve patient outcomes and reduce care costs*

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**A** new machine learning process designed to identify and classify hip fractures has been shown to outperform human clinicians.

Two convolutional neural networks (CNNs) developed at the University of Bath were

able to identify and classify hip fractures from X-rays with a 19% greater degree of accuracy and confidence than hospital-based clinicians, in results published this week in *Nature Scientific Reports*.

The research team, from Bath's Centre for Therapeutic Innovation and Institute for

Mathematical Innovation, as well as colleagues from the Royal United Hospitals Trust Bath, North Bristol NHS Trust, and Bristol Medical School, set about creating the new process to help clinicians make hip fracture care more efficient and to support better patient outcomes. [➔](#)

They used a total of 3,659 hip X-rays, classified by at least two experts, to train and test the neural networks, which achieved an overall accuracy of 92%, and 19% greater accuracy than hospital-based clinicians.

### **Effective treatment is crucial in managing high costs**

Hip fractures are a major cause of morbidity and mortality in the elderly, incurring high costs to health and social care. Classifying a fracture prior to surgery is crucial to help surgeons select the right interventions to treat the fracture and restore mobility and improve patient outcomes.

The ability to swiftly, accurately, and reliably classify a fracture is key: delays to surgery of more than 48 hours can increase the risk of adverse outcomes and mortality.

Fractures are divided into three classes – intracapsular, trochanteric, or subtrochanteric – depending on the part of the joint they occur in. Some treatments, which are determined by the fracture classification, can cost up to 4.5 times as much as others.

In 2019, 67,671 hip fractures were reported to the UK National Hip Fracture

Database, and given projections for population ageing over the coming decades, the number of hip fractures is predicted to increase globally, particularly in Asia. Across the world, an estimated 1.6 million hip fractures occur annually with substantial economic burden – approximately \$6 billion per year in the US and about £2 billion in the UK.

As important are longer-term patient outcomes: people who sustain a hip fracture have in the following year twice the age-specific mortality of the general population. So, the team says, the development of strategies to improve hip

fracture management and their impact of morbidity, mortality and healthcare provision costs is a high priority.

### **Rising demand on radiology departments**

One critical issue affecting the use of diagnostic imaging is the mismatch between demand and resource: for example, in the UK the number of radiographs (including X-rays) performed annually has increased by 25% from 1996 to 2014. Rising demand on radiology departments often means they cannot report results in a timely manner.







Prof Richie Gill, lead author of the paper and Co-Director of the Center for Therapeutic Innovation, says: “Machine learning methods and neural networks offer a new and powerful approach to automate diagnostics and outcome prediction, so this new technique we’ve shared has great potential. Despite fracture classification so strongly determining surgical treatment and hence patient outcomes, there is currently no standardised process as to who determines this classification in the UK – whether this is done by orthopaedic surgeons or radiologists specialising in musculoskeletal disorders.

“The process we’ve developed could help standardise that process, achieve greater accuracy, speed up diagnosis and alleviate the bottleneck of 300,000 radiographs that remain unreported in the UK for over 30 days.”

Mr Otto Von Arx, Consultant Orthopaedic Spinal Surgeon at Royal United Hospitals Bath NHS Trust, and one of the paper co-authors, adds: “As trauma clinicians, we constantly strive to deliver excellence of care to our patients and the healthcare community underpinned by accurate diagnosis and cost-effective medicine.

“This excellent study has provided us with an additional tool to refine our diagnostic armamentarium to provide the best care for our patients. This study demonstrates the excellent value of collaboration by the RUH and the research leader, the University of Bath.”

The study was funded by Arthroplasty for Arthritis Charity. The NVIDIA Corporation provided the Titan X GPU that carried out the machine learning, through their academic grant scheme.

# Trust in technology requires visibility

**Katherine Saunders**, Chief Executive of Alliance for Better Care (ABC) discusses how having visibility of connectivity was critical when delivering the COVID-19 vaccination programme.

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**T**echnology offers a massive potential for the NHS, but quite often the solutions fall short. Digital services can be seen as a hinderance to delivering good care rather than a benefit, particularly when the systems do not really speak to the end users, the nurses and doctors who need them. Distrust then follows.

ABC is a not-for-profit federation of 46 GP practices across East Surrey and Northwest Sussex. When the COVID-19 vaccination

programme kicked off in December 2020, ABC collaborated with its GP surgeries to deliver the vaccines on their behalf, enabling the GPs to focus on the needs of their patients. The digital services required to deliver the programme were vital to our success, most notably the connectivity on which the services relied.

## **The need for fast internet access**

ABC established eight local vaccination sites each able to deliver 1000+ vaccines

per day. We also provided a roving service for housebound vaccinations and outreach services to underserved areas of the community such as asylum seekers and homeless hostels.

Within the Crawley area, vaccines had initially been provided from a GP practice with some outreach from a Mobile Vaccination bus in association with Metro Bus. As the programme progressed it was clear that we needed extra capacity and accepted an invitation from the Hindu Temple in Crawley to set up

a permanent vaccination hub within its sports hall. Whilst the hall was perfect for the local community, the internet access was unreliable.

Fast internet access is important for several reasons. When someone arrives for their vaccine, their identity and NHS number is checked against a national database. Our team then verifies that the individual is eligible and once the injection has been given, a record of the vaccine number is recorded.

Minimising any bottlenecks means we can move the maximum number of people through the process and ensure they are happy and healthy before they leave. What we don't want is anyone waiting around in the rain or cold. Also, if people see a long queue outside, they are unlikely to hang around. The whole process must be as smooth and efficient as possible and solid internet access is critical.

Paper-based systems are available in an emergency but can cause considerable delays. On the occasion when we had to record on paper rather than digitally, we could only do half the vaccinations that day. It has a real tangible impact whilst also leading to frustration amongst the doctors and nurses who start to distrust the technology.

### Insight into the network

When we first set up within the sports hall, the internet access provided via the Hindu Temple was intermittent.

We were blind to the reasons behind the poor service and felt quite helpless. We needed visibility of what was going on, and confidence that the service would be reliable. We aren't IT professionals, so we needed the information shown to us in a way we can understand.

We got in touch with a company called Highlight, and they donated free access to their leading service assurance platform. With Highlight's easy to understand graphical display, we can see what is happening across all the networks serving the hall including the broadband, the Wi-Fi and the cellular. We can see if there is an issue within the hall itself or if it is an external problem beyond our control.

We can now adjust our activities to ensure everything keeps running. If we spot an issue on the broadband, it prompts a restart of the router, or we can report it to our service provider. On one occasion we found that a particular machine was pushing out lots of data and causing a considerable load on the network which caused

our key record application to run slowly. This was easily adjusted to a quieter time. On another day, we found that the backup cellular network had failed. Again, it was quickly spotted and resolved before it became a problem.

Due to the unpredictable and dynamic nature of the COVID-19 vaccination programme, new sites often start with just temporary cellular uplinks which require particularly close attention. Highlight has provided insight into the quality of the cellular radio reception at these sites, as well as running application experience tests from the Wi-Fi to ensure the end-to-end experience of the vaccinators is as good as it can be.

Highlight's support has been invaluable. It has shown me that when digital solutions are presented in a way that non-IT professionals can easily understand, it enables accurate decisions to be made about critical services. Being able to see exactly what is happening on the network means we can act quickly to deliver the best vaccination service possible. As of January 2022, we celebrated 670,000 vaccinations given.

# The role of clinical communication in a smart hospital

Dr Benjamin Kanter, Chief Medical Information Officer, Vocera

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A smart hospital is not a new concept. But it is one which is gaining significant momentum, and which can provide the NHS with a range of opportunities to improve services and patient outcomes.

Clinical communication forms a key pillar of that development but is one

which can be overlooked at times by people wanting to progress their digital transformation journey.

Dr Benjamin Kanter, Chief Medical Officer at Vocera, explains: “Despite it’s known importance, people often overlook the fundamental role clinical communication systems play in turning a digital hospital into a smart one.

“Being digital – converting analogue processes into digital ones – does not by itself make a hospital ‘smart’. A digital hospital simply means that there is digital infrastructure.

“What makes a hospital smart is not digital infrastructure, rather it’s quick access to data accompanied by a rapid conversion of data to actionable information.”



To achieve this, NHS trusts need to be looking at their clinical communication and collaboration (CC&C) platform. A modern, effective CC&C platform can connect the dots between human and digital systems, helping the hospital operate in tandem between all staff, patients and technology.

On paper, installing a new state-of-the-art CC&C platform seems to be a no-


brainer of a decision for any organisation which has the resources to allow it, but there are key considerations which must be made, as Dr Kanter explains.

In particular, any implementation of a new system must be able to function within the hospital's existing technological environment. Interoperability is essential to the success of the CC&C platform, as it must

be able to communicate with and take information from both human users and the existing hospital platforms and technology to inform care.

But how does an organisation make this happen?

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**The role of clinical communication in a smart hospital**

Dr Benjamin Kanter, Chief Medical Information Officer, Vocera



# Infection Prevention

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Matt Roberts



# Reducing the cost of your front-line infection control equipment

Clare Humphrey, Category Manager, Miele Professional

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The last two years have demonstrated to anyone working either within or alongside the NHS that infection control must be prioritised. Whilst we appear to be over the worst that Covid-19 has had to throw at us, what this situation has certainly done is open our eyes to the risks that we all face daily. A pandemic such as this could easily be on the cards again and, although we are now better equipped to deal with Covid-19, the cost to life and to the NHS and other healthcare services has been almost unthinkable.

As the dust settles and the healthcare sector starts to take account of what it has learnt during this incredibly challenging period, one thing is certain: anything that helps to reduce the spread of infection be an ally in the day-to-day operation of healthcare environments. There are some key areas that will help with this battle

– the kitchen, the laundry, and the sterilising rooms.

In each of these areas there is equipment that can help to ensure a ‘clean first time’ approach by thermally and chemically disinfecting items, be they linen, crockery or surgical equipment. Users are guided through the process by intuitive interfaces to ensure no mistakes are made, all the while providing you with the most efficient and effective solution.

The very latest equipment in all three areas from Miele Professional offers both thermo and chemo disinfection, and the peace of mind of wash cycles that reach high enough temperatures to ensure the eradication of infections. What’s more, Miele machines also guide users through programme selection to ensure correct daily operation of the equipment and precise dosing of things such as washing liquids.

Equipment that is going to be working 24/7 also needs to have reliability at its core. Miele designs, builds and tests all its commercial products to withstand at least ten years of rigorous daily use - that’s equivalent to 30,000 cycles for our washing machines and 15,000 cycles for our dishwashers. But at its heart, Miele is a company that truly believes in sustainability and with the new targets that all sectors are being challenged to deliver on following COP26, it’s important to know that the products are almost entirely recyclable. They are also built to be more efficient on water use, chemical dosing and power consumption too, helping to keep operating costs to a minimum.

So, if you are looking to increase your defences to the spread of infection whilst saving money, being more sustainable and improving your lifecycle costings, then you should look no further than Miele Professional.



# Making the difference in mask manufacturing & design

**Matt Roberts**, Editor, National Health Executive

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**Jon Constantine-Smith**, Managing Director, Bluetree Medical

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Incorporating transparent elements within masks has become an important conversation, particularly those being used in healthcare settings during

the Covid-19 pandemic and beyond. Effective communication often relies on much more than just verbal conversations, with traditional opaque masks

often obscuring facial gestures or other non-verbal cues, which can be particularly disruptive for the elderly, children or people with hearing impairments.



However, creating an effective, medical-grade transparent mask is not as simple as just adding in a transparent element to an existing design. Rather, there are a number of practical use considerations which need to be made to ensure that the masks are safe and functional in a variety of settings.

One such manufacturer, Rotherham-based Bluetree Medical, have seen the benefits of taking those considerations on board, having worked in partnership with NHS professionals at Alder Hey Children's Hospital NHS Foundation Trust among others. Through partnerships and input from healthcare professionals using the products, as an R&D-capable manufacturer, Bluetree Medical were able to innovate and design products which better suited the needs of those using them.

Jon Constantine-Smith, Managing Director of Bluetree Medical, recounts: "Our key focus is making products with [input from] healthcare professionals. We want to work closely with the people using medical consumables so we can design and manufacture products which meet their needs.

"We really want the future to be in transparent masks.

"Our involvement with Alder Hey came when one of our founders was introduced, and they were really impressed with how quickly we'd transformed the business during the pandemic and taken a range of type IIR masks to market.

"Working with them has been fantastic. They've given us real insight into things we wouldn't have previously considered – it's crucial to have that healthcare professional's perspective.

"With the BrillianSee mask we've been developing, just one very small example is that we had to make sure that there was a certain angle to the transparent element of the mask so that when you looked down you still [had full visibility] of your hands. It's little things like that which we might not have thought of which come from working so closely with people who are experts in their field."

To take advantage of this expertise though requires flexibility and a willingness to adapt and learn based on feedback. For Bluetree Medical, given their origins, this comes quite naturally.

Originally a printing business, the rallying call put out during the early pandemic for manufacturers of masks and other in-demand medical products coincided with

Bluetree Group's own plans to expand – allowing them to make a swift flex into the new industry and scale up output and facilities at speed. In that transition, Jon took on his new role within Bluetree Medical and helped develop the product range of Bluetree Medical to include transparent masks as well as oversee the ramp up in production to meet the increased demand for PPE from the NHS.

Jon explains: "When the pandemic hit, many of our customers were small businesses and were forced to close. On our site in South Yorkshire we had a spare warehouse which we were just about to turn into a second manufacturing site for print.

"We quickly recognised that there was a real opportunity for us to support the NHS, but also the country as a whole, in a real time of need.

"We went ahead and started turning that spare warehouse into a medical device manufacturing facility. We purchased 30 face mask manufacturing machines to make Type IIR masks.

"We started working to convert this empty warehouse, installing seven clean rooms and recruiting 200 people, in preparation for scaling up production to be able to support the NHS." ☺

This isn't just seen as a quick, short-term opportunity for the parent company, Bluetree Group, either. The company hopes to be a long-term manufacturer in the UK and has invested accordingly. Spending much of 2021 preparing for the future, Bluetree Medical has also gone through the process of gaining its ISO 13485 and ISO 14001 certifications, as well as "recently installing some high output, highly automated equipment".

And the added benefit of Bluetree Medical investing into their own facility is that they have been able to retrofit it with the necessary equipment and processes to not only manufacture, but also testing and on-site lab capabilities to support the research and development side of the business.

Jon continues: "We have our own in-house lab. That's been absolutely critical. Obviously, there is a lot of testing and regulation involved in producing medical devices. [Having the lab] gives us that ability to make sure what we're doing is the right quality and meets the necessary standards.

"We've got a team led by a biochemist with a PhD in chemical engineering – it's a really strong team there who not only help us with the R&D side, but also monitor quality.



“It makes us a lot more agile and quicker. We’re not waiting for external test houses all the time for results – we can get a good feel of where we are internally before move in a certain direction.”

Particularly during the peak of the pandemic, when many manufacturers were looking to transition into medical device manufacturing, the availability of these test houses was becoming increasingly limited. As such, having an in-house test function ensured progress was always being made at Bluetree.

The company also was able to offer another, human benefit in the pandemic too – as a proudly UK-based manufacturer, their agility and flexibility allowed them to continue forward as a local employer, supporting

the economy in and around their factory site. At a time when many, particularly in the manufacturing sector, were struggling this was able to make a significant positive impact to their local communities.

Jon adds: “We made over 200 jobs when we started Bluetree Medical, which at the time was absolutely fantastic for the area.

“A lot of the team we took on had been made redundant from other manufacturing plants in the area, so it made a really big difference to the community. South Yorkshire has got a great manufacturing history, so we were able to recruit skilled machine operators who were able to join us and really help us over the last 12-18 months to grow the medical division to where it is today.”

Looking to the future, the ambition is to continue that growth. According to Jon, Bluetree Medical want to ensure they become a long-term mainstay in the UK medical consumables manufacturing sector, bringing to market their transparent masks such as the BrillianSee and Visib models, as well as continuing to innovate and develop new products in partnership with healthcare professionals.

Jon Constantine-Smith originally joined us on National Health Executive’s Finger on the Pulse podcast.

[CLICK HERE TO LISTEN TO THE FULL PODCAST](#)



## Episode 028

# FINGER ON THE PULSE

Reducing the cost of your front-line infection control equipment

**Jon Constantine-Smith,**  
Managing Director, Bluetree Medical



# Why wiping away infection requires the use of plastics

**Professor Jean-Yves Maillard**, Professor of Pharmaceutical Microbiology, University of Cardiff & Member of the Safer Disinfectant Network.


Picture a building 200ft high. Now imagine the space taken up by two tennis courts.

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**T**hose are the dimensions of the so-called 'Fatberg,' the human-made mound of waste and detritus held together in large part by non-flushable wet wipes that thoughtless consumers have simply flushed. It's the starkest example of the environmental harm caused by products being incorrectly disposed of and what campaigners rightly point to when demanding action to protect wildlife and waterways.

Small wonder then that the UK government is considering the possibility of banning plastic from wet wipes.

We should be very clear on this point: there is no good reason to flush wet wipes made of plastic. They're not designed or manufactured to be disposed of that way. But, whilst the efforts of environmental campaigners are laudable, a blanket ban on plastics in wet wipes is not the answer – yet. At present, introducing blanket legislation could come with serious unintended consequences for infection prevention and control, patient care and patient safety. We should have the ambition to ultimately become plastic-free, but doing so immediately would have consequences and, in terms of the products used for 



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infection prevention, further work is needed to develop satisfactory alternatives that are effective and not prohibitively expensive.

There is a distinction that must be made between ‘consumer’ products that you would use at home for personal care, and the professional ones that are used extensively in hospitals, GP practices, and community care – not to mention business and schools. These are wet wipes that are admittedly made with plastic, but for a very good reason – and removing plastic at present could potentially cause more harm than good.

Professional wet wipes play an essential role in preventing or reducing the spread of infection. The obvious example is their usage against SARS-CoV-2 (the virus responsible for Covid-19), but you could just as easily point to MRSA, norovirus, or any of a multitude of viruses and other pathogens. They’re used routinely on wards and in surgeries to clean and disinfect high-touch surfaces and equipment. Some types of professional wet wipes will also be used directly on patients. Without them, it would be far harder to prevent the spread of infections in environments where, by definition, individuals are more vulnerable to illness.

Similarly, professional wet wipes will be used in business, in industry and in education as preventative measures, which can in turn reduce demands on the health service.

To be able to kill and eradicate viruses and other pathogens, professional wipes are impregnated with detergents, cleaning agents and in some cases powerful disinfectants. And the more these are absorbed by the wet wipe, the less effective it will be. This is why professional products are currently made with plastic fibres, as they absorb less of the disinfectant active agents than non-plastic alternatives.

Whilst the pandemic has spurred a rapid and innovative response from the healthcare and medical technology world, unfortunately, to make a product that meets the strict efficacy standards the NHS requires, at present, it simply must currently include plastic. Take away the plastic and you're left with a less effective, less useful wet wipe. That has real-world consequences for patient care and patient safety in healthcare – and the effectiveness of cleaning and hygiene regimes in businesses, schools and public places that are designed to help prevent people becoming ill and needing medical intervention. It's also worth noting that professional grade products should be treated as industrial or clinical waste, and in the case of the NHS, guidelines are in place which dictate how they should be safely disposed of.

What this all means is that we must be extremely careful when it comes to future legislation on how wet wipes, at least those for professional uses, are made. Yes, we need to tackle the environmental damage that products cause but we must be mindful of the unintended consequences. That doesn't mean there shouldn't be an ambition to get to plastic-free, even in professional products. But we

shouldn't ignore the reality that, certainly at present, organic alternatives could be less effective and more work is needed to develop professional plastic-free products that guard against the spread of infection and which are affordable.

### **So, what should be the solution?**

Arguably, it's two-fold. Yes, there is a case for legislation to ban plastic immediately from products where it's not needed. But any legislation must make that distinction. There are legitimate reasons to use plastics in some professional products at present and it would be unfortunate in the extreme to impact patient care with new laws that affect important infection prevention procedures. At the same time, we must of course encourage effort in education of end users and continue working and innovating to find environmentally friendly alternatives in all types of wet wipe products.

Any effort to protect the environment should be welcomed, and we shouldn't accept harm to wildlife and waterways that's caused by consumer products that have been inappropriately disposed of. If legislation can address that problem, then it should be supported.

But we should resist the urge and the temptation to think that all plastics should be immediately removed, especially when at present there aren't acceptable alternative solutions which will not decrease product efficacy. Whilst we should certainly support research into alternative substrates that enable the eventual removal of plastic from wet wipes, the reality is that at present, there is a need to protect the efficacy of professional products.

For the moment, a nuanced approach to legislation, combined with public education, is needed. A sweeping bill might help the environment, but it could put patients and those particularly vulnerable to infection at greater and unnecessary risk.

# How the lessons learned during the pandemic can inform wider infection prevention strategies in the NHS

**Matt Roberts**, Editor, National Health Executive

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Infection prevention has always been a primary consideration of the health service, though since the Covid-19 pandemic it's importance to the safe, effective operation of the NHS it has been more widely recognised by the general public and patients. Having experienced two years now of 'hot' and 'cold' Covid zones, enforced closures and mandatory hand hygiene and face masks protocols, patients and visitors too are much more aware of their role to play in good hospital infection prevention.

As we begin to come out of the pandemic and restrictions have been lifted, it is essential that healthcare providers remain vocal, vigilant and visible with their infection prevention messaging.

We've been gifted a perfect opportunity, if through very difficult and imperfect circumstances, to revolutionise patient and visitor infection prevention. The general population is perhaps more vigilant to their own health and safety than ever before, and much more receptive to the necessary steps and 'inconveniences' – for want of a better way of describing them – which support healthy and safe health environments. ↻



People are taking greater notice of information and messaging around infection prevention and control, due to concerns and awareness of the spread of Covid-19. The virality of the pandemic highlighted just how easy it is for airborne viruses to spread, and people are beginning to understand the dangers of passing on illnesses to others without proper care being taken.

That is not to say that those who are sick should not attend healthcare facilities. Exactly the opposite. Our healthcare professionals have long been versed in infection prevention measures, and their workplaces have all the necessary processes and equipment in place.

Rather, it is to say that those attending from the general public may now also seek


out the nearest place to wash their hands or wear a face mask if they're attending with a cold or flu-like illness.

Similarly, for those hospitals or healthcare sites who do experience a viral outbreak, or even just heightened risk, the general population are now more educated on the reasons behind service changes or certain closures.

Healthcare has always existed to protect, treat and monitor the sickliest of us in society, and to achieve that it is just as important to keep out external risks as it is to treat the internal conditions a patient might be experiencing.

Each year, hospitals and NHS facilities across the face issues such as MRSA and norovirus – the “winter vomiting bug” – which can often be tracked in, unintentionally, by members of the public attending routine appointments at these sites. Once there, these viruses can spread rapidly and are a regular battle for NHS infection prevention teams – particularly given that for those in hospital, the impacts of the viruses can be much more severe.

By using many of the lessons learned from Covid-19 and the close management of the virus in our healthcare facilities, these NHS infection prevention teams can more effectively limit the introduction of these viruses, and isolate and segregate those higher at-risk patients within their care.

It would not be unreasonable to suggest the introduction of ‘hot’ and ‘cold’ zones for other, highly virulent hospital-based illnesses would be an effective approach to 



managing these outbreaks; and in truth, is not too far of an evolution from the current NHS approaches.

### **Expanding out beyond the hospital**

It is not just within the healthcare services itself either that these learned lessons can be utilised. In the wider public sector, directors of public health can also take advantage of many of the health lessons which have been picked up during Covid-19 around infection prevention and management and apply them to other virulent illnesses.

It cannot be overlooked that the NHS and traditional healthcare is directly impacted by a wide range of broader health determinants, and the upcoming introduction of statutory integrated care systems (ICSs) will play a major role in better unifying these different stakeholders on a common path.

If local authorities and directors of public health can utilise their knowledge and expertise in population health, training and responsibilities to improve infectious disease control in their local populations – and increase education and awareness among their communities – then they will be able to curtail some of the





spread of these diseases in the community before they become broader issues or a strain on resources.

Their understanding of local places also helps them introduce locally-based initiatives such as contact tracing, pop-up and outreach public health facilities and emergency planning.

Collaboration was also a huge part of the pandemic success, both within healthcare and externally with local authorities, the public sector and private industry. While partly encouraged by extreme, unprecedented

circumstances brought on by the pandemic, there has been a lot of learning and innovation driven here which could be used to equally target and support the treatment of other virulent illnesses.

The continued development of new, accessible face mask technology – including, for example, transparent face masks which provide better functionality for hearing-impaired people – will not disappear with the end of the pandemic and will have potential beneficial uses for healthcare professionals when faced with other, more common illnesses.

This will allow for heightened infection prevention measures to be able to be in place without impacts on the quality or frequency of services – essential as our healthcare service looks to build back from the pandemic and overcome a mounting treatment backlog. Staff will be seeing huge volumes of patients, and there will be risk of common, virulent illnesses spreading such as norovirus and flu-like conditions, which can be overcome through some of the pandemic vigilance. →



After the two years of the pandemic, almost nobody – from healthcare professionals to the general public – are likely to cut corners when it comes to infection prevention, and that will have positive impacts on other illnesses too.

While some will have been masked by Covid-19 reporting, it is no secret that statistics for many other common hospital-acquired infections (HAIs) were lower during the pandemic. Anecdotally, many seemed to feel common illnesses in the local community were less frequent as well.

We have seen our working and living patterns altered significantly, and for many who now see hybrid or remote working long-term as part of their future, there is also less exposure to illnesses in crowded workplaces or during busy commuter times on public transport.

Those same transport providers and employers have recognised the importance of infection prevention technologies and good ventilation, with many businesses across the country investing heavily in technology to support them in this – not just as a way of exiting out of the pandemic, but equally as a long-term health investment.



### Taking every possible step

One of the biggest considerations which has to be made when talking about infection prevention in the health service though is that you can never say never.

No matter how thorough the interventions and processes you put in place are, there will always remain a risk of infectious diseases spreading within a hospital. The job of not only the infection prevention team,

but of every staff member, patient or visitor within a hospital is to take care and the steps necessary to make that percentage chance of viruses spreading as small as possible.

That comes through the introduction – or now, post-pandemic, the continuation of – robust, targeted infection prevention approaches and the continued availability of hygiene spaces for both staff and visitors to use; the sinks, hand gels and

antibacterial gel which had become a vital tool throughout the pandemic.

It comes through continued messaging and education to ensure that people from all walks of life and ages are aware of the importance of infection prevention, and crucially not just in the context of Covid-19 but all virulent illnesses which can spread throughout hospitals and healthcare sites. ➔

It comes through continued close collaboration with those in the public sector and private industry to learn from one another, innovate and introduce new solutions to both existing and emerging infection prevention challenges.


And it comes down to a recognition that it is the responsibility of every person within a healthcare setting to abide by and champion good infection prevention practices. That is the staff, patients and visitors.

Then, just as we did during the pandemic, we will be able to limit the spread of illnesses within our hospitals and ensure that there is a continued, safe and effective delivery of care to all those who need it across our NHS.

Through difficult circumstances, we have uncovered so much learning in these past two years around infection prevention. While the pandemic is beginning to come to an end, it would be a wasted opportunity to allow this learning and innovation to disappear with it.





A photograph of a man wearing a white face mask, sitting on a train. The image is overlaid with a red color filter. The man is looking out the window. The text is overlaid on the left side of the image.

**“It comes down to a recognition that it is the responsibility of every person within a healthcare setting to abide by and champion good infection prevention practices. That is the staff, patients and visitors.”**



# Early multidisciplinary research during the 2020 lockdown

University of Southampton, Global Network for Anti-Microbial Resistance and Infection Prevention

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In the early months of the COVID-19 pandemic, a great deal was unknown about the infection and disease and, with much of the country in lockdown, researchers and inventors were investigating ways to reduce the impact of the

disease. These included the development of diagnostics, infection prevention tactics, therapeutics and public health measures. This article reports on activities that members of NAMRIP rapidly developed, on their own initiative, in response to the

crisis, with a range of funding sources or none. Reporting on multiple teams means that word limits do not leave room for the full team and sponsor listings for each project and interested readers can consult the links herein.

## Infection Prevention

In those early months, with vaccines a long way off, infection prevention was crucial, and yet much about the infection routes was not yet known. For workplaces in health and social care, research and essential services, and for the general public, there were different needs and prioritizations when it came to the provision of PPE and good information.

In April 2020, the PerSo team began designing a personal respirator prototype for frontline healthcare staff, freely sharing the design online, and partnering with industry to make them commercially. Over 3,500 were used by staff at University Hospital Southampton during wave 2, all requested by staff. The full-head hood, with fan-driven air filtered and blown over the visor, was later adapted to designs that left the ears free to facilitate hearing (Figure 1). In June 2020 the Perso-DW (Developing World) team shipped 135 hoods to Ethiopia.

Respirators were also needed for those research labs, essential services and the general public, who did not have access to the PPE dedicated to frontline healthcare workers. One of our commercial partners,

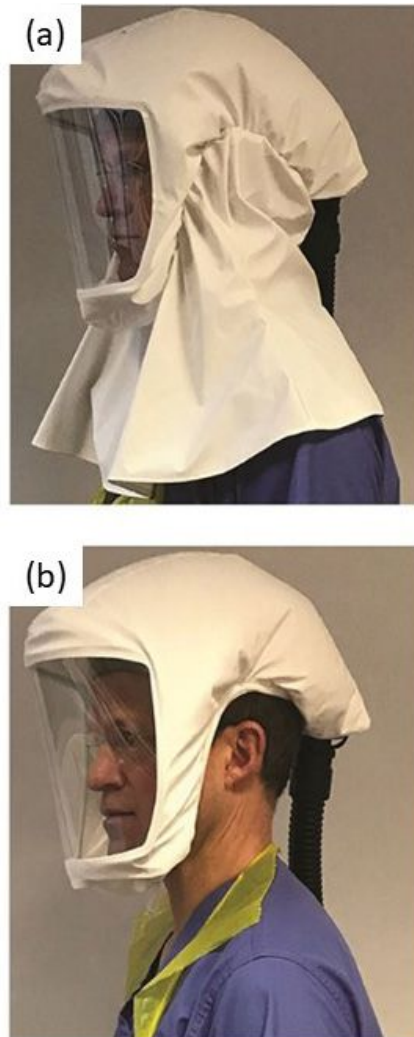


Figure 1. PerSo variants with (a) a long hood type, and (b) short hood type that exposes the ears (adapted from *Front. Med. Technol.*, 14 October 2021, <https://doi.org/10.3389/fmedt.2021.729658>).

SWT, noticed that widely available builder's/mechanic's/DIY masks contained an airtight face-seal, lasted 28 days, filtered the in-breath, but were compromised by an exhalation valve that released potentially-infectious exhalations without filtration. SWT

released files for free that anyone with a 3D-printer could download to add a filter to their exhalation-valve (Figure 2). A month later the US Centre for Disease Control released a warning against the use of masks as supplied by manufacturers (i.e. with only a simple, unfiltered exhalation valve).



Figure 2. The filter (black and white) attachment to the exhalation valve on a standard builder's/mechanic's respirator.



Figure 3. Prototype technology for the ultrasonic water tap.

SWT also produced (for the UK Government's Innovate-UK) prototypes of its ultrasonic water tap for cleaning respiratory secretions off, for example, intubation tubes (Figure 3). By the start of the pandemic, the Mapping Microbes collaboration of geographers, nurses, engineers and microbiologists had already been highly successful gathering data, and releasing

movies for public and healthcare professionals, on infection routes via touch surfaces. During the pandemic they focused on infection routes on public transport, bringing together corporate, government and public stakeholders to identify issues, then publishing a report and series of short films (on 5 November 2021) to convey their findings to the public (Figure 4).

Before the pandemic, the 'Germ Defence' team had developed a website to encourage behaviour to reduce viral transmission. GermDefence is the only website worldwide proven to reduce infections in the home, and so in April 2020 the Germ Defence team released an update of their website to help combat COVID-19. With the aid of citizen science this was quickly translated

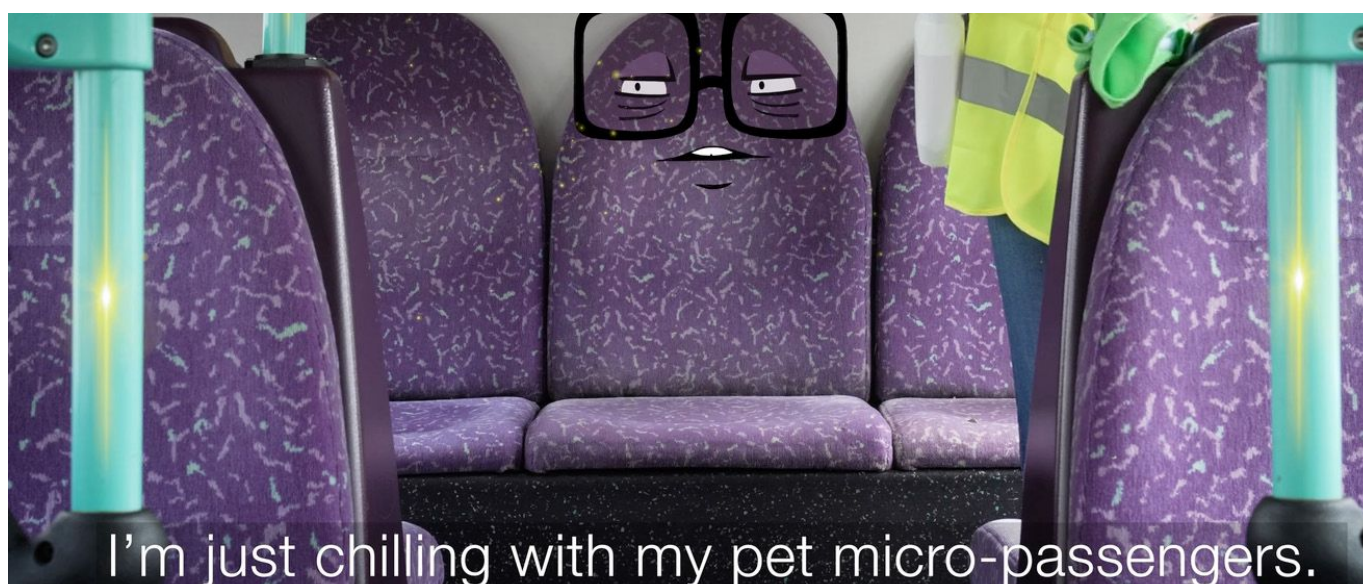


Figure 4. Video frame from film 1 of the 'You're never alone on the bus' series, ('Fresh air shows we are').

into 27 languages and used in 173 countries during the pandemic.

### Diagnostics

At the onset of the pandemic, to explore faster options than traditional PCR tests provided at the time, a team from the University Hospital Southampton NHS Foundation Trust and the Faculty of Medicine took part in evaluations of two kits: FebriDx (a finger-prick blood test of 248 viable patients, tested 20 March and 12 April 2020, and published 20 June 2020) and QIAstat-Dx (a real-time polymerase chain reaction test of nose and throat swab samples from 499 viable patients, tested 20 March 20 to 29 April, and published 20 October 2020). Both of these point-of-care tests were subsequently rolled out as part of routine clinical care at University Hospitals Southampton.

The CERAbTc-19 (Clinical Evaluation of Rapid Antibody Test for Covid-19) team conducted a clinical evaluation of the accuracy and clinical usefulness of a rapid antibody test for COVID-19 in a drop of capillary blood, developed by a diagnostics company in China. Two groups of adult participants were recruited at Watford General Hospital, in two groups: (a) patients who had confirmed COVID-19 on

PCR (from 5th March to 18th June 2020) and (b) hospital staff with history of clinically suspected COVID-19 (based on reported symptoms) who had a standard venous antibody test (from 1st May to 22nd July 2020), at least 7 days after onset of symptoms. The results were published on 18 November 2020 and 14 July 2021.

The Laser-Direct-Write Technologies for Biomedical Sensors Team at the Optoelectronics Research Centre were, by May 2020, exploring the development of the next-generation lateral flow tests using their laser-based fabrication process.

By June 2020 the Microguide app team had adapted their phone-based app (Figure 5) to combat the inappropriate use of antibiotics during the early days of the Covid-19 pandemic, which was resulting in a resurgence of antibiotic-resistant pathogens such as *C. difficile* in some UK hospitals. The app is licenced to over 70 NHS acute Trusts.

### Public Health

In July 2020 the RTO-Covid-19 team launched a retrospective survey of prevention, treatment, occurrence and outcomes of Covid-19 in the community. They collected data on

what behaviours people undertook, what symptoms they experienced, and what they did if they became infected.

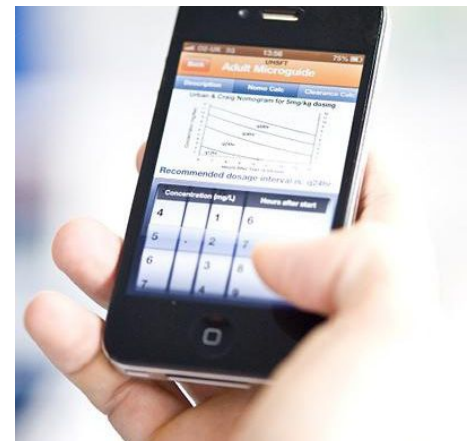


Figure 5. The Microguide app.

The Tec-19 (Teenagers' Experiences of COVID-19) team researched the experience of teenagers in Low- and Middle-income Countries during the pandemic. Starting in August 2020, the aim was to understand how the pandemic was affecting the lives, mental health and well-being, and eating habits and physical activity behaviours of young people living in both rural and urban settings across sub-Saharan Africa (Ethiopia, Ghana, South Africa) and India. The hope was to progress to developing resources to support young people to maintain well-being, eat well, keep active and adhere to government guidelines during the pandemic. →



## Conclusion

Management of an outbreak of a known infectious disease is based on specific prevention (e.g. vaccination) and/or specific treatment. Management of novel infections always relies on interrupting the chain-of-transmission with non-specific measures, until more is known, and specific measures can be introduced. A reliable knowledge base reduces the uncertainties, but in its absence, ingenuity and a quick response are required. The activities in this article covered 2020, a time before

vaccines were available, and when therapeutics were at an early stage.

Since 2000, more than 6 novel zoonoses have crossed species barriers from wild animals to humans (SARS, MERS, Ebola, Avian-flu, Swine-flu and SARS-CoV-2). It seems inevitable that further novel infections will emerge, and just because society has recent experience of one pandemic, it would be foolhardy for the public and lawmakers to assume the next novel infection will always use the same chain of transmission as

did SARS-Cov-2. Airborne infections are particularly hazardous (Figures 1 and 2), and effective handwashing (as illustrated by Figure 3 and GermDefence) is useful against for most infections.

Even well-funded communities have a shortfall in the provision of infection prevention, compared to the need (note for example the frequent Norovirus outbreaks in the cruise industry). Multidisciplinary communities are a valuable tool to provide fast-response, and longer term, solutions.

# Environment

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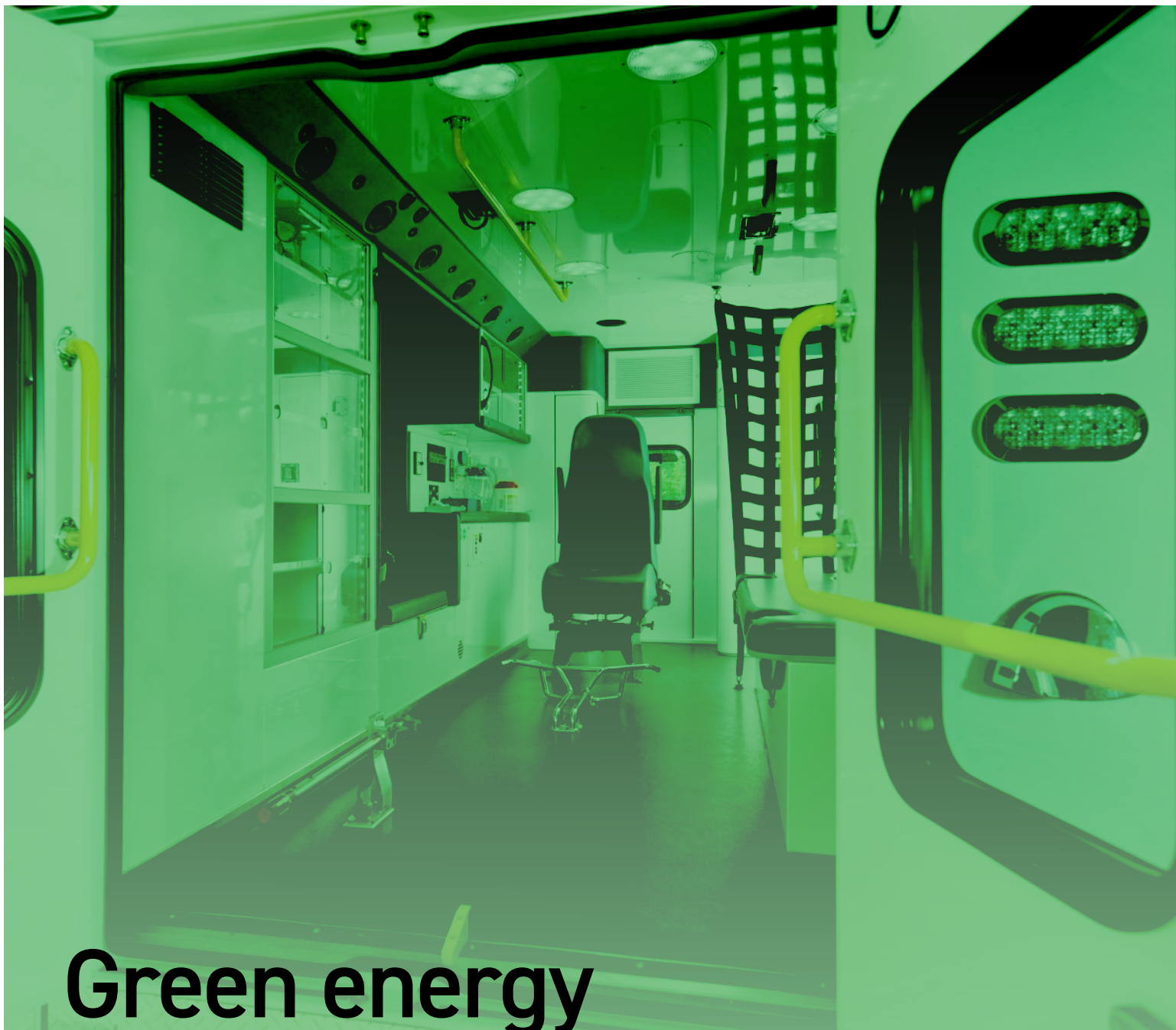
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# Green energy improving health for the most vulnerable

**Professor Al Story**, founder  
and clinical lead of the UCLH  
Find&Treat Service

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**F**ind&Treat screen thousands of the most vulnerable, homeless and high-risk people every year using a mobile health and radiology unit deployed from UCLH as part of a pan-London Inclusion Health Outreach service.

The service also works with HSA nationally to respond to outbreaks in congregate settings. Find&Treat have pioneered an internationally recognised and award-winning model that overcomes barriers to care by taking state-of-the-art diagnostics

and treatment directly to the most vulnerable people and supporting onward care. The service has been independently evaluated as highly cost effective through preventing severe disease and future infections. The outreach team have led the pandemic response across London, outreaching COVID testing, vaccinations and supporting isolation for more than 20,000 people in emergency accommodation.

Now, our Mobile Health Clinic has been extensively refurbished with a new portable mains voltage

digital x-ray camera and seamless high speed cloud connectivity all powered on green energy via a hybrid battery with split charging capabilities.

Switching from a large diesel generator to electric power will result in a carbon footprint reduction of an estimated 25,000 tons per year at the same time as improving air quality in central London providing a cleaner, safer service user experience and enhanced staff wellbeing. ➔



The pandemic has accelerated inequality and is already driving a growing number of people into homelessness. The landlord eviction ban has ended while welfare payments have returned to pre-pandemic levels as the cost-of-living increases. The charity Shelter predicts the economic fall-out from the pandemic will lead to increased statutory homelessness and rough sleeping.

For people forced to live on the street clean air is not a choice. As a health worker treating homeless people it's a no brainer to reduce pollution, a causative agent of ill health, not least during a respiratory virus pandemic. This technology means our care extends to our environment as well as treating illness more quickly and preventing onward infection.

We are one of the first health services globally to use nuclear medicine powered purely by battery pack on the side of the road. We can take digital radiology state of the art point-of-care diagnostics and portable equipment to provide results on the spot.

Digital radiology needs a lot of current. Historically our vehicle was a diesel drinking machine belching fumes and creating noise and vibration. The system has been designed to provide zero emission and silent operating for in excess

of 9 hours in any single instance without the need to re-charge, so effectively we run green from morning to night. This new unit is super quiet and super clean. It is an infinitely more pleasurable environment to work in.

It meets the green hospital targets and it also fits in with the Camden clean air project while we are reducing the amount of carbon we produce. It is low emission which is of course great for the public health but particularly for the vulnerable patients we serve.

The van has been fitted with ultra-fast, secure communication technologies with support from NHSX, enabling a whole spectrum of services that were previously necessarily building-based. Patients get diagnoses quickly and easily on-board rather than needing to visit a hospital, making healthcare more accessible, acceptable and efficient for everyone.

The team are trialing Artificial Intelligence software for Computer Aided Diagnoses on chest radiology coupled up with a tele-radiology network to allow remote reading of x-rays using flat-pack satellites, 4 and 5G routers, un-steered sim cards and smart antenna systems sponsored by NHSX as part of the NHS Digital Future WIFI Project Trials. Find&Treat have been evolving the service for

almost 20 years to become the integrated model it is today. Working with academic partners at UCL Collaborative Centre for Inclusion Health to demonstrate need and evaluate the effectiveness of interventions has enabled the team to translate evidence into commissioned services. This includes piloting and undertaking the world's first randomised controlled trial of Smartphone supported treatment for TB vs usual clinic or community-based treatment support. The trial demonstrated that Smartphone supported care was far more effective in enabling patients to adhere to prescribed treatment, much more flexible and acceptable to patients, and highly cost-effective. Based on this success, Find&Treat now support TB patients to complete long courses of drug treatment nationally and are piloting this technology platform to support Hepatitis C and HIV patients.

With over 200 third sector partners across the capital, Find&Treat have a unique opportunity to engage and train social care professionals to support the health of the clients in their services. One of the partners we regularly visit is the team at the Single Homeless Project, with hostel sites in Westminster, Islington, Camden and Hackney. They tell us that the support that they get from



the Find&Treat Mobile Health Unit has been really valuable and in particular over the past few years during the pandemic when health service were even more difficult to access for some of the most vulnerable.

The Find&Treat model includes a team of peer workers, who have lived experience of homelessness and social exclusion. Peer workers are highly trained and directly provide point-of-care testing, diagnostic procedures such as

portable FibroScan to assess liver health and support onward treatment and recovery. The Peers know first-hand the challenges and barriers to accessing and engaging with health services. They enable our service to reach people who are largely invisible to the NHS, build trust and transform their health opportunities and outcomes. People know and trust the team and that is really important because too many have had terrible experiences with healthcare. They have felt judged and unwanted,

even though they are trying to access services that they are entitled to and need.

We believe that now is the time to invest and scale this active case-finding and onward care model nationally. Tackling health inequity, eliminating rough sleeping and confining TB and Hep C to the history books are all national policy priorities, none of which will be achieved unless we can reach those most at risk.

# Preparing the NHS estate for the impact of climate change

Esther Ukala, Environmental Compliance Manager at NHS Property Services, on how the company has been preparing to adapt the NHS estate to mitigate climate change impacts.

**“Still sitting in rags by the stove: under-resourced, underfunded and often ignored.”**

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**T**his is how The Climate Change Committee has described Climate Adaptation - the process of changing practices and structures to moderate potential damages or to benefit from opportunities associated with climate change.

We are already seeing our climate changing - with record-breaking temperatures, frequent storms and flash flooding all fresh in our minds - and yet for so many businesses, minimising

climate impact remains in the periphery of agendas. As owners of approximately 12% of the NHS estate, we at NHS Property Services (NHSPS) have an important role in helping the NHS to deliver excellent patient care. We there appreciate the value in building climate resilience through ensuring appropriate adaptation and management of our building portfolio.

Data is an essential starting point to help all organisations make informed decisions. For a critical topic like climate adaptation, it is vital. With

this in mind, we knew a structured, strategic insights-gathering approach would give the best grounding for successful operational decisions. To do this properly, however, means NHSPS need to take the lead and invest a significant proportion of time and resource to the project, working with a truly long-term-oriented mindset.

To start with, and as part of our initial data gathering process, we launched an investigation to map our high-risk facilities against climate-related risks, predicting how they would

cope under different climate scenarios and time horizons. The 300 sites chosen were those where patient care services operate 24/7 and there would therefore be a significant impact on NHS services and patient care, should the site succumb to climate-related impacts.

We assessed the risks over different time horizons - present day, 2040 and 2100 - using a number of global warming scenarios. These included the worst-case scenario of a 4 degrees Celsius temperature increase, a 2 degree increase and the best-case scenario of a 1.5 degree cap. For each of these, we analysed the following risks: heat stress, wind, precipitation, coastal flooding and drought. Our 300 chosen sites mainly consisted of buildings from late 70s, 80s and 90s, though we also had some buildings that were over 80 years old and have thus significantly proven the test of time already. We found that while heat will have an effect on the buildings, it is an increase in wind patterns that would be the biggest problem for our sites, with tornadoes and storms expected to cause significant property damage.

The findings obtained from the preliminary exercise has given us food for thought as

we look to how we can adapt our buildings to mitigate for wind damage, and will form part of our greater portfolio adaptation management plan. It has also given us the rationale to expand our investigation to all our sites over the next 3 years and widen its scope. This will include assessing not only the chronic physical risks, i.e. the gradual changes in weather patterns, but also the acute risks, i.e. extreme weather occurrences and their increasing frequency and severity. We will be looking at additional factors such as not only coastal flooding, as we had done previously, but also fluvial and pluvial flooding. Included in our adaptation management plan will be the impact of these climate-related risks on local communities, which would have a subsequent knock-on effect on our services e.g., through increase in patients, suppliers and other service users.

From the investigation, we also recognised the need for education and knowledge sharing within the organisation - how to make sure that our colleagues are aware of climate adaptation and have the guidance they need to make the most appropriate decisions when it comes to adaptation measures.

These insights will also be taken on board when developing our new buildings, ensuring sustainability and climate resilience are front of mind to ensure longevity of the sites. We are already leading on the development of one of the first net zero health centres in England - the Devizes Health Centre in Wiltshire. Heat pumps and solar panels will be among the green technology used at the site and will enable the building to reliably generate its own energy, as well as conserving resources.

As the well-known phrase goes - "by failing to prepare, you are preparing to fail". This sums up the mantra of the NHSPS climate change adaptation programme. By investing in research and analysis of our portfolio and how it will weather future climate change, we will know the best way to adapt our buildings and mitigate for this. It will also give us insight on our transition risk and whether we, as a business, are prepared. On behalf of myself and the whole NHSPS team, we are honoured to be able to lead in the NHS climate adaptation space and support the healthcare service in building resilience. We also look forward to sharing the results of our wider risk assessment investigation as we proceed over the next few years.



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# Committing to a decarbonised estate

Northumbria Healthcare NHS Foundation Trust

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**T**hrough Greener NHS, the health service has set out its net zero commitments at a national level, but these have to be delivered through action at a regional and local level.

At Northumbria Healthcare NHS Foundation Trust, decarbonisation has been at the heart of its approach on minimising its environmental impact for a number of years, through sustainability plans focused on the three key areas of waste, energy, and travel and transport.

Despite the impact of Covid-19 pandemic, the trust, which runs hospitals and community services in Northumberland and North Tyneside, recorded a drop in overall carbon emissions in 2020-21 of 21% on the previous year, which includes a 58% reduction in energy emissions and a 40% reduction in waste emissions.

The trust's commitment to decarbonise its estate is evidenced by the major project currently taking place at North Tyneside General Hospital, with the aim of reducing its emissions by a massive 80% in the years to come.

It is hoped the up-to-£22million scheme, which will result in a replacement of the steam system which

provides the heating for the hospital, alongside other energy-saving improvements, will act as an example of how a working hospital can become much more environmentally-friendly, not just for the rest of the trust's sites across Northumberland, but also for the NHS nationally.

The main element of the work at North Tyneside is to 'de-steam' the site; the 40-year-old boiler and steam distributions systems will be coming out and the entire hospital will be run on low-temperature hot water – provided primarily by air-source and water-source heat pumps.

In addition, solar panels will be installed on the roof, all of the windows are being switched from single-glazing to double-glazing in a phased approach, and cavity wall insulation is being installed across the site.

Mike Blades, the Trust's energy and sustainability officer, said: "This is a much-needed project that will have a significant impact in terms of reducing our carbon emissions, which should drop by 80% over a 15-year period, with the largest drop in the first two years.

"We have already spent around £3 million making changes that you could describe as 'easy wins', for

example, upgrading all of the lighting at our sites, but to make further inroads, we have to make significant investments, such as the one here at North Tyneside.”

This project is being funded by a grant from phase one of the Government’s Public Sector Decarbonisation Scheme, however, the trust’s commitment to becoming more sustainable is underlined by the fact that it was committed to carrying out the project ahead of this funding opportunity.

The recently-opened Northumbria Sterile Processing Centre, for cleaning and sterilising medical equipment, at the Northumbria Specialist Emergency Care Hospital site in Cramlington, was a net-zero development, but it has also helped support this decarbonisation of North Tyneside General Hospital, as the sterilisation department previously located there was a major user of steam provided by the current heating system.

The green efforts on the estates and facilities side are being matched by those to ensure that clinical practices are as sustainable as possible and that emissions and waste are being reduced wherever possible, with significant work taking place

in teams across a range of specialties – theatres, critical care, endoscopy, respiratory, maternity, pharmacy, radiology, labs and A&E.”

Speaking after the trust won the Clinical category at the Sustainability Partnership Awards in November 2021, Northumbria Healthcare’s clinical lead for sustainability, Dr Elaine Winkley, who is also chair of the North East’s pioneering Faculty of Sustainable Healthcare, said: “We have only been successful because this is a team effort – with buy-in from staff at all levels – and there is a firm commitment to continue to work together, as this is the only way that we will make a significant difference in reducing our environmental impact.”

Examples include the endoscopy department moving on from addressing the ‘quick wins’ such as making sure there were recycling bins in place and ensuring waste was segregated to launching projects to tackle the production and use of sterile water, challenging suppliers on waste and packaging, and the use of nitrous oxide, or gas and air, which has a global warming potential around 300 times that of carbon dioxide and remains in the atmosphere for more than a century.

Elsewhere, the trust has introduced personalised, reusable theatre hats, which help ensure people’s names are obvious to other staff and patients, but are also more environmentally friendly and produced in its own manufacturing hub, while the anaesthetic department has stopped using desflurane, which is more than 2,500 times more warming than carbon dioxide.

Plus, Northumbria Healthcare has installed a machine which melts face-masks down into plastic blocks which can then be used to make new products, such as chairs, kidney trays, bins and containers. It also recycles curtains, drapes and wraps, all of which are made from single-use polypropylene plastics.

Following feedback from a staff survey on sustainability, Northumbria Healthcare has also launched a Green Champions scheme, which has seen dozens of staff volunteer to get involved to help the Trust on its journey as it bids to reduce carbon emissions and its overall environmental footprint, minimise waste through reuse, recycling and energy production, and introduce and promote green initiatives wherever possible, under the banner of Sustainable Northumbria.





The champions cover a wide range of jobs, with nurses, GPs, consultants, anaesthetists and admin and management posts all represented, and they come from across the Trust's various hospitals and non-clinical sites.

The trust first appointed an energy and sustainability officer back in 2007, but refreshed its commitment to sustainability in 2021 with the launch of Our Community Promise, which

has Action on Environment as one of its six key pillars, given the importance that environmental factors also have on our long-term health.

## Fact-file

Increasing use of non-face-to-face appointments, accelerated by Covid, resulted in 2.6 million miles less travelled by patients last year.

The recently opened new sterilisation centre on the Northumbria hospital site in Cramlington is a net-zero development, and the new hospital at Berwick will be too.

96% of the trust's general black bag waste is used for energy production and work is ongoing to continue to improve on this figure.

Northumbria has been using electric vans for deliveries since 2015 and is continuing to invest in more. There are now 79 electric vehicle charging points installed across nine trust sites.