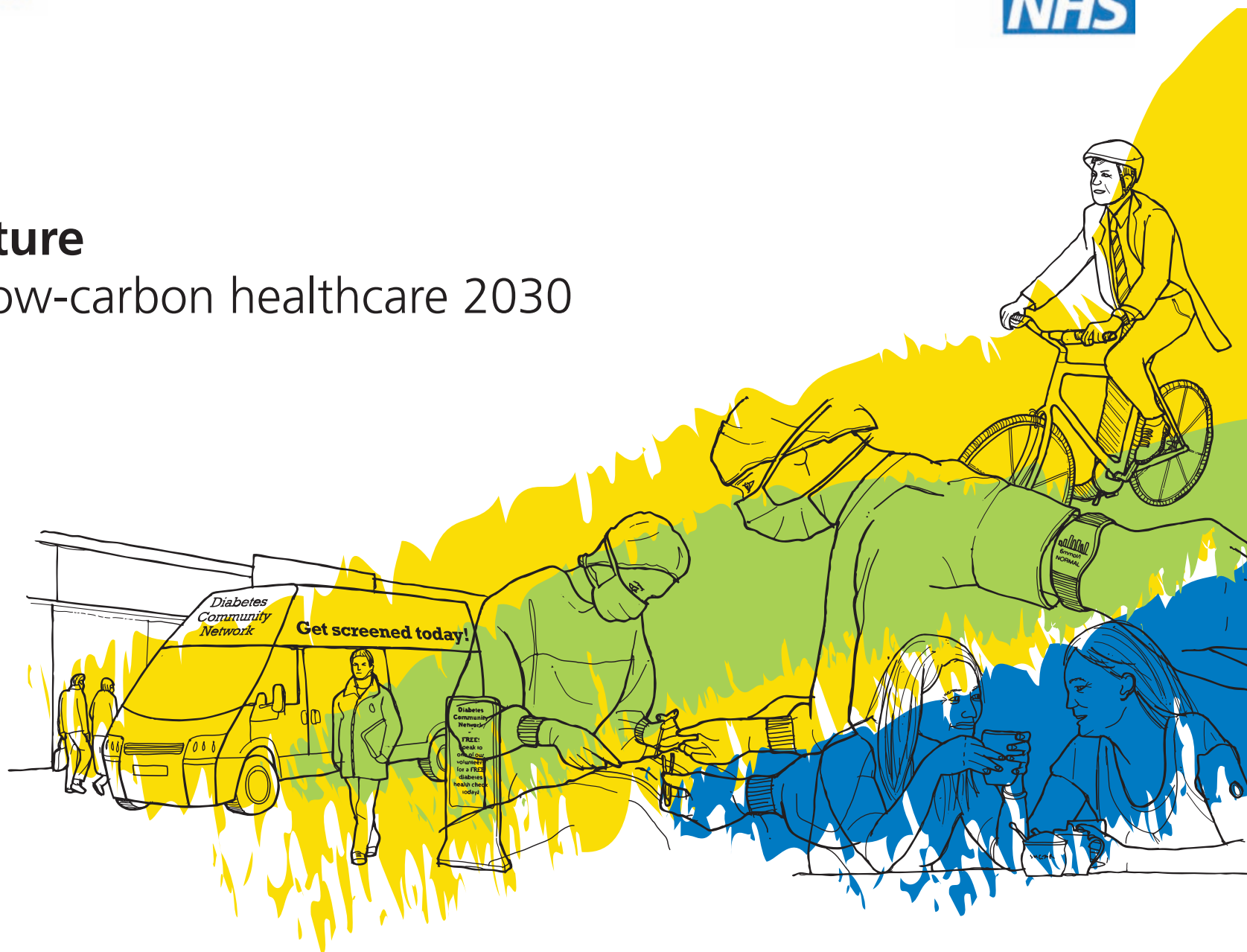




Fit for the Future

Scenarios for low-carbon healthcare 2030

September 2009





Acknowledgements

Many thanks to the following who gave time to participate in developing these scenarios, both through workshops and interviews:

Name	Organisation
Jag Ahluwalia	Cambridge University Hospitals Foundation NHS Trust
John Appleby	King's Fund
Martina Bohn	Association of British Pharmaceutical Industry
Naaz Coker	St.George's Healthcare NHS Trust
David Colin-Thomé	Department of Health
Paul Corrigan	Independent Consultant
Michael Depledge	Peninsula Medical School
Richard Douglas	Department of Health
Nigel Edwards	NHS Confederation
Lucy Ellis	Department of Health
Roger French	Yorkshire and the Humber SHA
Fiona Head	NHS Sustainable Development Unit
Peter Homa	Nottingham University NHS Trust
Sarah Lee	Department of Health
Hermione Lovel	Department of Health
Helen McCallum	Which? Magazine
Neil McKay	NHS East of England
Ruth Passman	Department of Health
David Pencheon	NHS Sustainable Development Unit
Roger Quince	West Suffolk Hospital Trust
Gurch Randhawa	Luton Teaching PCT
Clive Robinson	University Hospitals Coventry & Warwickshire
Sonia Roschnik	NHS Sustainable Development Unit
Iain Thompson	Sheffield Teaching Hospitals NHS Foundation Trust
Julius Weinberg	City University
Chris West	UK Climates Impacts Programme
Sue White	Sheffield Teaching Hospitals NHS Foundation Trust
Graham Winyard	Winchester Action on Climate Change

Contents

1. Foreword	4
2. Summary	5
3. Factors shaping the future	8
4. Scenarios	11
Service Transformation	12
Efficiency First	18
Redefining Progress	24
Environmental War Economy	30
5. Creating healthcare systems that are fit for the future	36
6. How to use this report	38
7. Appendix: Key questions used in the development of the scenarios	39



1. Foreword

As ever, healthcare in England faces an uncertain future. Rising demand for services, austerity measures in the pipeline, and familiar debates about entitlement, priorities and structures point to choppy waters ahead. But beneath the surface, profound changes are also underway that question the model of healthcare provision familiar to us all for generations. Demographic change, new technologies, a changing climate and seismic shifts in the global economy will affect our lives in ways we find hard to anticipate, let alone prepare for.

That's why *Fit for the Future* is such an important and timely report for healthcare in the UK. It takes one of these major trends — the changing climate — and imagines some of the different ways this and other factors may play out over the 20 years through to 2030. By speculating about some different 'worlds', it encourages us to lift our gaze from the mesmerising complexities and challenges of today, and apply a different test to our actions. Against that backdrop, what are the most sensible 'next steps' for the healthcare system?

Some of the best brains in healthcare in Britain have been involved in developing this work. Reassuringly, they conclude that being 'fit for the future' means doing many of the things for which there has been a strong case but little political will or resource for many years — including shifting the emphasis to prevention, and helping people take more responsibility for their own health. But it also means healthcare professionals and organisations taking a leadership role in making healthy, low-carbon lifestyles possible for everyone — a challenge on which work has barely begun.

We hope you find *Fit for the Future* a suitably provocative read, and can find ways to apply its conclusions to your own work.



Jonathon Porritt,
Founder Director, Forum for the Future



Sir Neil McKay
Lead NHS Director for Sustainability

2. Summary

Fit for the Future explores scenarios for the healthcare system in England in 2030. It was commissioned by the NHS Sustainable Development Unit to help healthcare organisations think about the medium- and long-term future, and understand and prepare for their role.

The report concludes that a low-carbon NHS is a more efficient NHS and, if the service is to provide the best possible quality of healthcare in the future, it must build both its efforts to mitigate climate change and its resilience to that change. This requires investing in the future and getting it right. Climate change is the biggest global health threat of the 21st century.¹

Fit for the Future recommends five key steps to creating a sustainable low-carbon healthcare system, which is prepared for whatever the future holds. (See section five of the report for full details.)

1. Support people in taking responsibility for their own health

In the context of declining budgets and the need for greater resource efficiency, the burden of responsibility for health is likely to shift back towards individuals in most plausible futures. Improving the health literacy of the population will help refocus the system on prevention. Enabling communities to play a role in healthcare provision could free up resources for acute care provision.

2. Build greater acceptance of ICT in healthcare provision

Higher carbon prices will make transport and carbon intensive facilities prohibitively expensive, and so information and communication technology (ICT) will play a major role in the future delivery of healthcare. Many of the technologies of tele-healthcare already exist, but are not yet widely accepted either by patients or clinicians. A cultural change in the system is needed to make the most of the benefits these systems offer.

3. Work to find the low-carbon / high quality of life sweet spot

Carbon-intense lifestyles have been bad for the environment and health in almost equal measure. So-called 'diseases of affluence' have almost overwhelmed the healthcare system. The NHS is in a prime position to take a leadership role in showing that low-carbon lifestyles can have a positive impact on our health. By working with local partners, it can help find the low-carbon sweet spot where lower carbon lifestyles are also happier, healthier lives.

4. Allocate resources to promote health rather than treat illness

High carbon prices will put pressure on public spending, so that even after the current economic crisis is over, downward pressure on health service budgets will continue. The NHS currently spends 4% of its income from taxpayers on prevention and public health.² Building this figure to 20% will save money and help future-proof services against long-term reduction in budgets.

5. Ensure the healthcare system takes a leadership role in the radical change we need to face climate change

As the climate changes, business-as-usual is not an option for any organisation within society. Breaking our dependency on fossil fuels for energy will lead to dramatic changes in everyone's lifestyle. The NHS, with its massive size and reach, could have a great influence on the rest of society by taking the lead on carbon reduction and climate resilience; taking climate change seriously comes close to being a duty of care for the service. But it will

¹ *The Lancet*, volume 373, issue 9676, pages 1693-1733, 16 May 2009.

² Based on 2006/2007 figures.



require a shift of philosophy and a cultural transformation within the organisation so that staff at all levels accept the likelihood of radical change. If the NHS embraces this new world then the response to climate change can become a great opportunity, not only for the service but also for public health.

The scenarios

The four scenarios for the future of the healthcare system are based on *Climate Futures*, a study published by Forum for the Future at the end of 2008, which analysed the social, political, economic and psychological consequences of climate change.

Fit for the Future updates and translates these scenarios for health and healthcare in the UK. Section three presents key factors that will affect health and healthcare in the years to 2030. These factors have been used in workshops and interviews with health sector experts — including NHS chief executives, senior clinicians and public health practitioners — to refine four scenarios for 2030, and to explore their implications for the healthcare system.

The scenarios and their implications are presented in section four, where each is also explored in a storyboard from the perspective of a person managing diabetes.

Service Transformation — The high price of carbon has created a new type of consumerist world, where businesses sell services rather than products and good citizens share with their neighbours. Communities work together to support healthy lifestyles and business takes increasing responsibility for promoting public health. But remote rural areas with the highest emissions per head are under served.

- Car ownership is unaffordable, but rent-a-car and rent-a-bike schemes are booming.
- Vegetarianism and healthy lifestyles are the norm, but libertarians are demanding an end to taxes on fatty foods.
- Some doctors avoid prescribing carbon-intensive treatments causing huge controversy.
- A 'rent-your-organs' scheme offers people lifetime care and advice in return for giving up organs for transplant at the end of their life.

Efficiency First — Rapid innovation and novel technologies have created a low-carbon economy with little need for changes in lifestyle or business practice. This is an increasingly individualistic, consumerist, fast-moving world. The private sector plays a growing role in healthcare and highly personalised services are available to those who can pay. But services for the poor have diminished and they rely increasingly on self-diagnosis.

- Drugs companies are constantly developing new medicines and are under pressure to release them quickly: many epidemics have been blamed on poor testing.
- People are used to online appointments with virtual doctors, and robot surgeons are often better than humans.
- Diagnostic T-shirts allow people to track their health; commercial monitoring services will set up an appointment if they notice anything unusual.
- The middle classes have their genome sequenced to identify their health needs. Personalised drugs are available, but only the rich can afford them.

Redefining Progress — Countries prioritise economic and social resilience over growth, and quality of life is the key goal. People value meaningful work, low-impact lifestyles and their community. Healthy living is a high priority, and much care is delivered through friends, families and charities. Workplace health schemes are common.

- Health groups have replaced book groups as a popular activity, and many meet online.
- Tobacco, alcohol and unhealthy food are highly taxed and society frowns on people who don't look after their health. Some organ donors refuse donations to these people.
- Slower lifestyles have led to a baby boom, putting pressure on carbon reduction targets.
- Pressure for an open intellectual property regime caused the collapse of the pharmaceutical industry; drugs companies are now run by the World Health Organization.

Environmental War Economy — This is a world which woke up late to climate change. Governments enforced tough action to make up for lost time, reshaping their economies as in times of war at the expense of many civil liberties. All resources are focused on tackling climate change. Public services are focused on absolute necessity and NHS services are much reduced from 2009.

- Meat production has been phased out because of its high carbon cost. The mid-2020s are remembered fondly for the glut of cheap meat as farmers reduced their herds.
- The national diet is much healthier — UK-grown, seasonal and largely vegetarian. Carbon tax has stopped food imports and the government delivers a weekly ration to homes.
- Prevention illness is viewed as efficient. Compulsory mass immunisation programmes move from street to street, vaccinating against malaria, flu and other diseases.
- The NHS uses carbon rationing to decide what treatments to give. Mobile services treat people at home if this will have a lower impact.

Using the scenarios to plan for the future

These scenarios are plausible versions of possible futures, not predictions. The future is inherently uncertain, but we do know that it is likely to be very different from today. Environmental change, technological developments, economic growth or recession, will all lead us in new and unexpected directions. Exploring what could happen using scenarios — in effect, asking 'What if?...' — helps us to prepare for that change. The aim of *Fit for the Future* is to encourage people with a stake in the future of healthcare to think and plan for radical change, and offer some starting points for a discussion. To that end, some suggestions on 'how to use this report' are set out at section six.



3. Factors shaping the future

How humanity responds to climate change between now and 2030 depends on a bewildering array of factors and the interactions between them. To understand the scenarios in section four, it helps to have an understanding of the factors that have been used to develop them.

For *Climate Futures*, Forum for the Future interviewed a range of experts from around the world — including top scientists, business leaders, activist and commentators — about their hopes, fears and expectations for the future. This research yielded the factors listed in seven areas below. New research for *Fit for the Future* identified additional factors which will drive developments in health and healthcare over the next 20 years, which we also set out below in more detail. These new factors were applied to the *Climate Futures* scenarios to understand how health and healthcare might develop.

The direct impacts of climate change

The way the climate changes in coming years will be critical in shaping our future. But because of the time lag in impacts of present and past emissions on the climate, most of the climate change that we will experience in 2030 is the result of past pollution. Action taken between now and 2030 will do little to alter the way the climate changes, though it will of course influence the resilience of our society.

For that reason there is little difference in the amount of climate change that the world has experienced in each of our scenarios. We have used the upper end of the 2007 Intergovernmental Panel on Climate Change estimates (IPCC, 4th Assessment Report, 2007) for the climate in 2030, as the latest science suggests that the lower end of these estimates is looking increasingly unlikely.

The changes to the climate that the world experiences after 2030 will be radically different in each scenario as they will depend on the political responses to carbon reduction that are put in place in the next 20 years.

This is one reason why, in our scenarios, we have not also dwelt on the new illnesses that we might see in the UK in 2030 as a result of changes to our climate.

Insofar as there are different ranges of morbidities, we see these as being more connected with other political factors (such as diseases brought by refugees in 'Environmental War Economy') than by changes to mean temperature, which will be the same across the different scenarios.

Public attitudes to climate change

The public perception of climate change will play an important role in the political responses that we see around the world.

A key question is the degree to which people are willing to make lifestyle choices that reduce consumption in the light of environmental pressures. Could we see a value shift away from consumption and onto considerations of wellbeing and quality of life?

In 'Redefining Progress' we see a world in which there has been such a shift in values, compared with 'Efficiency First' where a technological response to climate change allows

consumption to continue to drive the economy. If public attitudes prevent governments from concluding an international agreement on carbon reduction, we could find ourselves in a world where dramatic reductions are needed in a short space of time, leading to a world like that depicted in 'Environmental War Economy'.

How the business community responds

Whether businesses see climate change as a risk or opportunity will be critical to shaping the overall response to climate change.

A huge investment in technology would push the future in the direction of the world shown in 'Efficiency First', whereas a world in which businesses reconsider the fundamentals of their business model and shift from selling products to services leads to the type of society we see in 'Service Transformation'.

The nature of the global economy

The degree of international co-operation and the performance and structure of the global economy in the run-up to 2030 are hugely important factors in how the global response to climate change shapes up.

As noted above, a low degree of international co-operation in the coming years could push us towards the situation depicted in 'Environmental War Economy', where the late response means carbon reduction at an uncomfortably quick pace.

On the other hand, if we start to see new models of post-consumption, and countries moving away from using GDP as a measure of success, we could start to see the types of societal responses shown in 'Redefining Progress'.

Resources

Availability of resources such as energy, water and food will be crucial in the years to come. Whatever the distribution and availability of resources, political control of supplies is crucial.

It's not clear what the energy mix in the UK will be in 2030: our scenarios reflect a range of differences — with big technological solutions in 'Efficiency First' compared with more localised energy provision in 'Redefining Progress'.

The political response, at a national and international level

The response of political leaders around the world to climate change is crucial. Political priorities change in different times and places, but most important is how climate change competes with, or reinforces, other priorities.

Whether states go for market-led responses or incentives will have a big impact on the sort of responses we have from businesses. Working with the markets could lead to harnessing innovation which delivers transformation from businesses such as those seen in 'Service Transformation'.

More draconian approaches to carbon reduction, necessitated by an early lack of political co-operation, could lead to more of a war-like response seen in 'Environmental War Economy'.

Which technologies are developed and used

We can't predict which technologies will be important in 2030, though the probability is that they will be ones already in existence albeit used in a different way. We've seen in the last 20 years, for example, how the internet has gone from being a military application to a fundamental part of the way that we do business. Many experts expect that we will see huge improvements in energy efficiency and radical shifts in the way that energy is produced and distributed.

Whatever energy technologies are deployed it is clear that information technology will continue to play a vital role in our economy and the way we live — for example replacing a lot of the travel that we currently take for granted.



Factors in health and healthcare

Our research uncovered a wide variety of factors that will influence how healthcare develops and the health issues of the future. We grouped these under four headings that can be seen in each of the scenarios.

What are the factors influencing the causes of illness and death?

The UK's Department of Health commissioned a study in 2001 to look at the possible direct impacts of climate change on health in the UK.³ The findings, which were updated in 2008, projected that:

- cold-related deaths are likely to decline substantially (an estimate of 20,000 per year), while heat-related deaths are likely to increase by a much smaller amount (2,000 per year);
- cases of food poisoning could increase significantly (10,000 per year);
- injury and death from severe weather events will increase;
- cases of skin cancer and cataracts are likely to increase (5,000 and 2,000 per year respectively);
- the net impact of air pollutants on health will probably decline;
- the spread of vector-borne and water-borne disease may increase slightly but the effect is likely to be small.

There is clearly considerable uncertainty about some of these effects, but all in all the picture is one of a balance of the positive and negative. In our workshops our experts didn't feel that the set of illnesses predicted as a result of climate change will be particularly challenging for the NHS to deal with. This may come as a surprise to some who think that planning for these illnesses is the most important part of the NHS's strategic response to climate change.

These direct impacts are the same in all of the scenarios that we explore in this report. However, the indirect impacts of climate change on the causes of illness and death, and the wider changes as a result of other factors, are much harder to anticipate and may have more far-reaching effects than the direct effects of climate change. We explore different possibilities in the scenarios. For example, in 'Service Transformation' attempts to reduce carbon emissions have meant consumption of meat has declined and people lead more active lives. As a result, the burden of disease has declined. In contrast, 'Efficiency First'

describes a world that favours cure over prevention, with people leading unhealthy lives and spending money to deal with the consequences.

What do 'services for the public good' look like?

We can't assume that in the future we will have a public sector that is necessarily the size or shape of the one we have currently. In all the scenarios there is some form of service provision by the state, although for example in 'Redefining Progress' a lot of the services previously delivered by the public sector are now covered by volunteer organisations and community groups. Some private sector provision is also seen in most of the scenarios, and we also thought about the possible impacts on the pharmaceutical industry.

How has technology developed?

The development of nanotechnology and improvement in genetic therapy are big stories at the moment, but the degree to which these can continue in a carbon-constrained world is not certain. In 'Efficiency First' the societal preference for techno-fixes means that there has been a lot of progress in health technology as spin-offs from other research, whereas in 'Environmental War Economy' carbon rationing has meant that there have been no improvements in health technology since 2020.

How does society allocate responsibility for healthcare?

Will people take more responsibility for their own health? Are people more interested in prevention or cure? Who owns our healthcare information? What is society's attitude towards older people? All these questions came out of our research and are answered very differently in each of the scenarios. In 'Service Transformation' we build on the current trend to plan new developments better for health outcomes, and explore a world in which collaboration within and between communities is key. In 'Efficiency First' the state provides a basic safety net but individuals are expected to make their own provisions for healthcare via private insurance. Conversely in 'Redefining Progress' a societal shift towards wellbeing has led to prevention and healthy living being preferred.

³ Health effects of climate change in the UK, Department of Health, 2001, http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4007935

4. Scenarios

Our four scenarios show how health and healthcare in England could be very different in 2030. Adapting the *Climate Futures* scenarios on which they were based was done in a four-phase process:

Background research

Through desk research we collated a set of over 170 factors that we could foresee impacting on health in the next few decades. These ranged across many different sorts of topics, such as the growing number of people opting for surgery to deal with obesity, the degree to which people manage their own health information, the pressure on NHS resources, and potential changes to the role of pharmaceutical companies.

We worked to group these factors into different trends and distilled them into a list of 45 questions for use in the first workshop. These questions, such as 'What role does the private sector play in health service provision?', 'What is the role of the pharmaceutical industry?' or 'Is the use of the natural environment more integrated into healthcare prevention and cure?' were then grouped into four general areas that we used to structure our scenarios.⁴

Interviews

As part of our initial research we also conducted interviews with some leading thinkers on health and health policy. We presented them with the *Climate Futures* scenarios and asked them for their responses, what they considered would be the likely impact on health and healthcare, and how they imagined public services would be delivered in those worlds.

Workshops

We ran two workshops for this project with a variety of experts from across the NHS, the Department of Health, and other bodies.

We used the information that we had gathered from the background research and interviews as a starting point for the first workshop. We worked with participants to agree and prioritise the questions, grouping them and then finding different answers for each question under the differing contexts of the four scenarios.

After the workshop we took the results and used these, alongside the interview findings, to develop draft scenarios. We brought these to the second workshop for testing with participants, asking them to build on the scenarios and think about the implications for the NHS.

Consultation

After the second workshop we took the results and fed them into a second draft of the scenarios. We invited all the workshop participants and interviewees to be part of a final consultation on the finished scenarios, and incorporated the feedback from that process in the scenarios shown here.

Structure of the scenarios

The scenarios all follow the same structure. First, they explore the wider picture — what is the global context, what is the general political, social and economic backdrop? They then go on to address the four broad areas that our research and workshops told us were important in determining people's health and the healthcare system:

- What are the factors influencing the causes of illness and death?
- What do 'services for the public good' look like?
- How has technology developed?
- How does society allocate responsibility for healthcare?

We made no assumptions about the form of healthcare provision in England at the start of this process. By 2030, the NHS may be transformed and almost unrecognisable from today's perspective; it may not even exist. It will certainly need to be different from today in order to respond effectively to the challenges of the future, climate change not least among them.

⁴ The full list of questions is shown in the appendix.

Service Transformation



A high price of carbon has ushered in a revolution in how people's needs are satisfied.

Carbon is one of the most important and expensive commodities in the world today, unleashing **unprecedented levels of creativity** across the global economy. Companies have rewritten their business models to meet underlying needs, often by selling services instead of products. This is a new type of consumerist world, one with a 'share with your neighbour' ethos.

Europe led the way with its Energy Independence Initiative, driven first by concerns over energy security. The continent's successful new models in infrastructure and business have been exported around the world. Today in 2030, household washing machines are too costly, so advanced collective laundry services are more popular; **individual car ownership is unaffordable and undesirable**, but rent-a-bike and rent-a-car are booming and mass public transit is hugely successful. Rental services — which offer all-in-one maintenance and waste collection — are widespread for electronic goods.

India is a service hub, which has prioritised the roll out of 'zeta-broadband' to its villages over and above investment in roads. The dramatic transformation in business has been painful for some, with **rising unemployment in the old high-carbon sectors**. The USA's legacy of individualism — from urban sprawl to cleantech innovation — has made it hard to strip carbon out of its economy. Booming mega-cities are only just managing to cope and fuel poverty is a huge problem.

In the UK, the transition to a more service-based economy has been easier than in most other countries, but has not been without its disruption. The **unemployment** caused by economic restructuring is now in decline as the benefits of low-carbon innovation are reaped. With **carbon efficiency replacing cost efficiency** as the mantra of business and government alike, companies and public services have **localised** where possible, working closely with newly empowered communities. Although Britain is still a capitalist country,

it is a softer form of capitalism, focused less on the generation of capital and more on meeting needs. The population has grown quickly over the past 20 years and now stands at 71.7 million, with the over-65s making up almost a quarter of that number.⁵ Despite efficiency gains, sheer numbers place a great burden on infrastructure.

What are the factors influencing the causes of illness and death?

Overall, lifestyles have become healthier and the **burden of disease has reduced**. Mostly for climate change and affordability reasons, vegetarianism has boomed, growing from 7% of the population in 2009 to 20% in 2030. More people walk, cycle and garden. Communities work together, managing lifestyles to minimise CO₂ emissions, for example by producing their own food or generating low-carbon energy.

Cleaner transport and industry means cleaner air, and so **fewer related respiratory complaints**. Less traffic has also meant **fewer road accidents**. New building and infrastructure developments routinely 'design out' health and safety risks.

Conspicuous anti-consumption is popular. **Alcohol consumption has declined** significantly, partly because years of education about alcohol's deleterious effects have begun to hit home and partly due to a cultural shift towards healthier living. Obesity is also down, though this is as much a result of escalating taxes on obesogenic (and often carbon-intensive) foodstuffs and increasing physical activity as it is of the revolution in vegetarianism.

But there are noticeable problem areas. For example, there has been an increase in **fuel poverty**, due to high costs of energy, leading to increases in respiratory and other related complaints for these people.

Inequalities in access to communities and services have led to localised increases in **social isolation and depression** (especially in traditionally high-carbon rural areas). Other **mental health problems** have been on the up due to ever-greater reliance on technology, especially Information and Communication Technology (ICT), and a growing sense of fear and foreboding across society about the future impacts of climate change.

There has also been a significant **backlash against the healthy lifestyle mantra**, with a large libertarian minority campaigning for 'more telly, fags, burgers and booze'. A petition

⁵ This corresponds to Office for National Statistics (ONS) 'high life expectancy' projection (medium migration, medium fertility, high life expectancy).



was recently sent to Number 10 demanding that taxes on fatty foods be removed. The 'give us back our chips' petition included over 2 million signatures. At the other end of the political spectrum, some communities – self-styled 'Uber-healthiers' – refuse to participate in the formal health system, which they see as imposed and inflexible, believing that individuals need more control over their own health.

Carbon efficiency has become the over-riding goal for society, replacing cost efficiency. This has led to some perverse outcomes — for example, in 2026 there was huge media controversy when it was discovered that **some doctors were avoiding prescribing carbon-intensive treatments**, apparently placing climate change above patient care. Headlines on the Net since have frequently highlighted scandalous instances of so-called ACDs — 'avoidable carbon deaths'.

Over the past few decades a **more open and accepting approach to death and dying** has emerged in Europe, the UK included. Palliative care emphasises the importance of 'family-orientated positive deaths'. **Euthanasia** became a legal activity for licensed practitioners in 2021. The last three months of life are seen as a precious time of reflection, love and care.

What do 'services for the public good' look like?

With a very high carbon price set by government, all systems, including public service delivery, are designed to be as carbon efficient as possible. This has meant a **huge amount of re-organisation and not a little disruption**. Systems tend to be very efficient, highly structured and well-organised, but lacking in flexibility. As a result, it is often **difficult to accommodate special cases**. For example, remote rural areas, which have the highest per-capita CO₂ emissions, are under served. This is where **real social and economic exclusion exists**. Moreover, the health system has less capacity to deal with neglected or rare diseases, or conditions requiring complex or innovative treatment.

Public service delivery is tiered geographically to reduce the amount of travel and freight required, and to minimise the use of energy in large old buildings where retrofitting new technology is difficult. **Services take place at a more local level**, but are still directed from the centre to ensure that they are delivered as efficiently as possible.

The service delivery point of choice is the home. One result of this is a decline in the number of one-person households. The house-share or flat-share is now a phenomenon

throughout life, not just for students and young people, but for the over-eighties in particular.

This is an '**upstream**' rather than '**downstream**' world: policies are implemented to address the root causes of problems, rather than the manifestation of problems. Alcohol policy is a good example. Precious resources are devoted to educating people about alcohol harm, reducing the alcohol content of drinks, and incentivising alternatives to alcohol consumption (for example replacing pubs with recreation centres). Less emphasis is placed on addressing alcohol-related crime or injury directly.

How has technology developed?

Technology development continues apace and the high price of carbon means that **all new technology must be highly carbon-efficient** in order to have a chance of commercial success.

In fact, the carbon price has stimulated a huge amount of technological innovation. Devices are increasingly **flexible** — suiting various needs and so minimising duplication of gadgets — and **durable**, thereby increasing the overall material and energy efficiency of the economy.

Virtual communications have boomed. Despite efficiency improvements, the internet still uses huge amounts of energy, but clever siting of server farms and routing stations means that it is now run primarily on renewable sources. If a transaction can possibly be made **virtually, using ICT**, it is.

The ubiquity of virtual networks extends to healthcare. Local health practitioners can **track disease detection in real time**; the spread of infectious disease can be tracked globally meaning that the policy response can be almost instantaneous; and remote diagnosis and care is the norm.

How does society allocate responsibility for healthcare?

Healthcare is seen as the responsibility of the whole of society. **The approach is collaborative.** Communities work together to support individual healthy lifestyles and the public sector and business also take responsibility. **Market-based solutions** are implemented wherever possible, working with communities. This gives business a major role, though government is important in framing how the market works. For example,

businesses routinely make provision for their employees' health at home as well as in the workplace, and employee contracts ensure that **working environments promote healthy lifestyles**.

There has been a huge transformation in the **pharmaceutical industry**. It is more common for companies to seek to make money by maintaining people's wellness rather than selling drugs for when people are unwell. One business runs a '**rent-your-organs**' scheme, in which, in return for lifetime care and advice, customers agree to give up certain organs for transplant at the end of their life.

'**Carbon Cartels**' have been permitted by the government where there is a clear overall benefit to greenhouse gas reductions. For example, pharmaceutical companies have agreed different areas for competition and collaboration.

What does 'Service Transformation' mean for the healthcare system in 2030?

New constraints and new opportunities?

The all-pervading emphasis on low-carbon activity in this scenario would mean radical changes for the health system: avoiding travel where possible, developing much more localised systems, and a heavy reliance on ICT (using renewable energy sources).

Devolved funding?

The health service in 'Service Transformation' would probably remain funded chiefly from national government coffers, swelled perhaps by taxes on products and behaviour that are both unhealthy and carbon-intensive. Central funding might be supplemented with local

taxes at a local level. Individuals could be charged for use, with tax incentives to help reach the excluded and to encourage healthy and low-carbon behaviour. The overall cost of the health service may be lower, due to efficiencies and the type of care necessary.

A lighter burden?

The health system would in some ways have less to do. This is a scenario in which measures to change people's behaviour have worked: most people's diets are much healthier; people lead more active lives; and the environment in general is more healthy and encourages healthy lifestyles.

What's more, a changing attitude to end-of-life could mean less need for investment in expensive and energy-intensive end-of-life treatments. Much wider sharing of responsibility for health across society could lighten the burden on the health service itself.

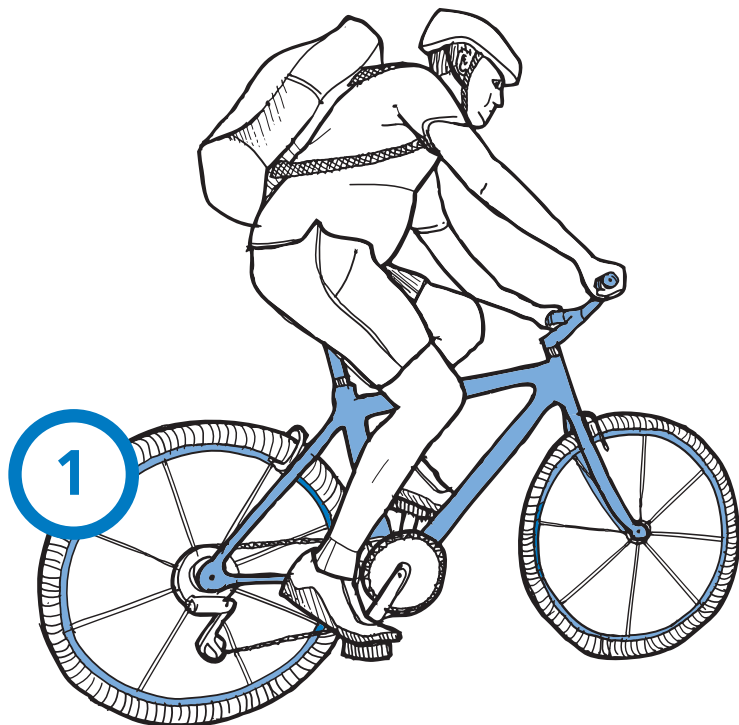
Challenges in reaching everyone?

The healthy society in 'Service Transformation' would not just be the responsibility of the health service, but more likely a range of different services all working together: communities, local authorities, schools, and so on. The local focus may also mean a more integrated approach, with one local organisation providing prevention work, primary, secondary and tertiary care. This would no doubt increase the exposure of health services to most people.

But it could be harder to target the needy: those for whom energy costs are too high, who are unable to use ICT or who live in remote and inaccessible places. It may also be more difficult to accommodate the needs of people who reject the healthy lifestyle mantra: a health service more geared to prevention than cure could have difficulty treating large numbers of people who persist with unhealthy diets and lifestyles.

Service Transformation

Chris Johnson: 42 years old, male



I've only got two options, walking or cycling to work, and I don't enjoy either. The weather never seems on my side! I've tried to move closer to the office but it's too expensive. I suppose it's good for me as it's the only exercise I get, but I do wish there was better public transport where I live.

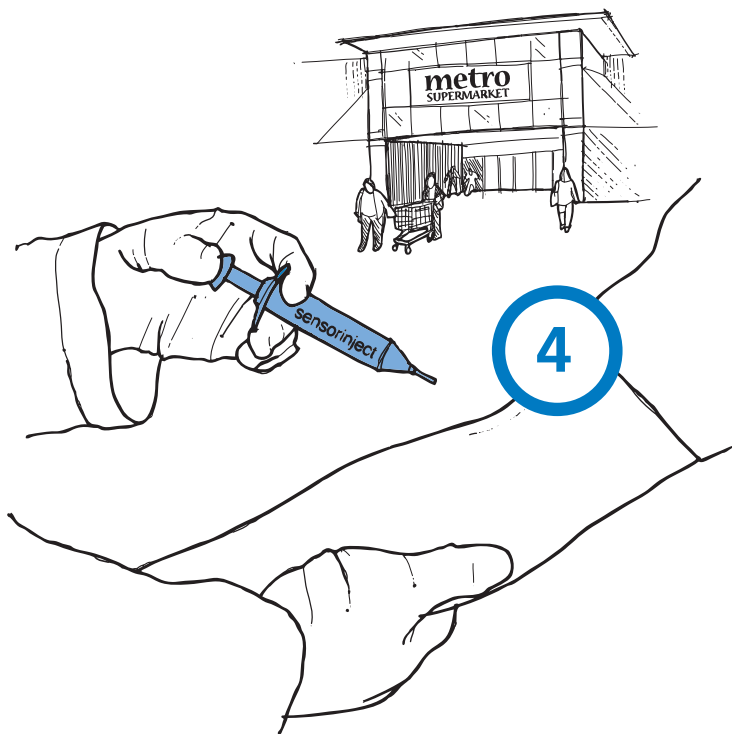


I have to admit that I'm not the healthiest person alive. I've got a sweet tooth and I'm always too busy to cook so I rely on convenience food. I'd like to be fit, but to be honest I'd rather sit down and watch the telly with a cigarette, a burger and a beer to wash it down. That beats going for a run anytime.

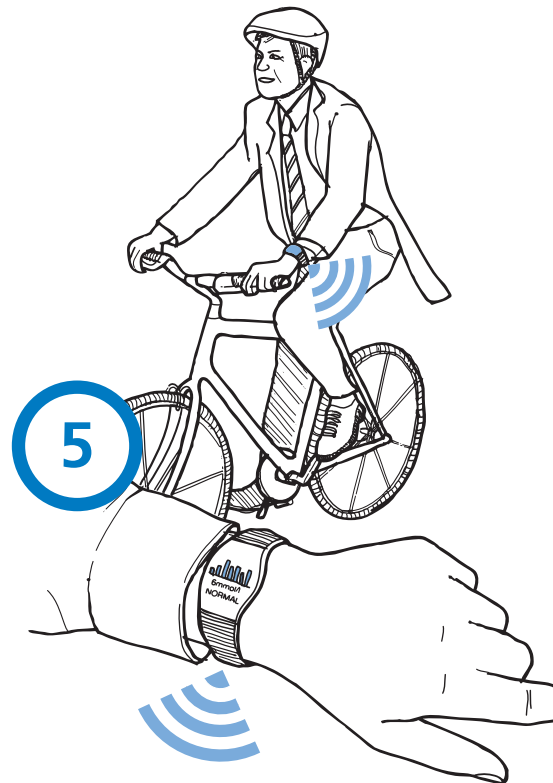
I e-shop twice a week and I go to Metro once a month for a 'big stock up' and a bit of retail therapy. I love the shops and services they've got there. Luckily I've got a rich neighbour who has a car he doesn't mind sharing.



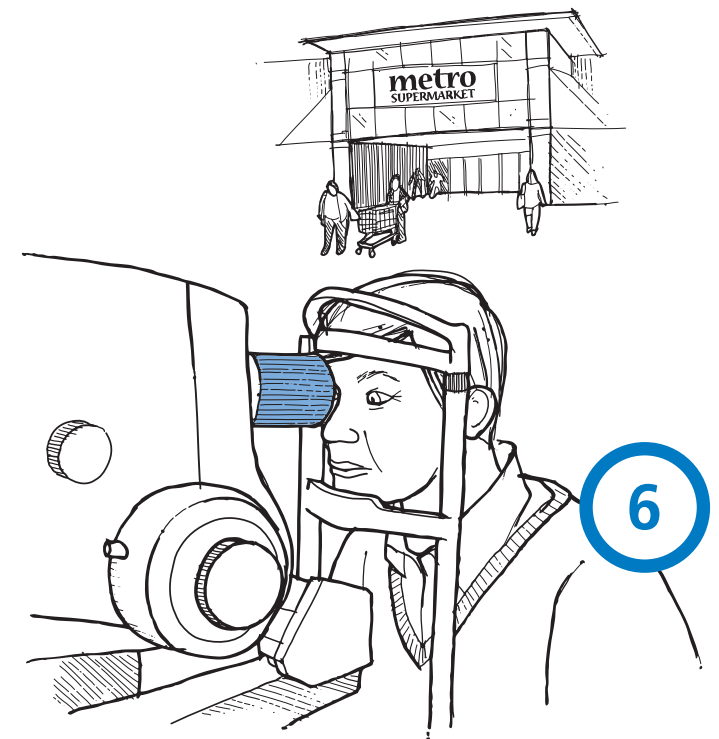
I get quite a few offers from my Metro membership and I thought I should take them up on the wellness programmes and free health checks. Apparently they could tell I wasn't very healthy because of the food I was buying. I went in for a check and found out I had Type II diabetes.



I had a blood glucose sensor surgically implanted under my skin — they do it via a syringe so it's not so bad — and the NHS picked up the bill.



The wellness programme convinced me to go in for regular sessions and I also agreed to use a 'lifestyle monitor' to keep track of my activity levels. It syncs up to my glucose sensor and helps me manage the diabetes. One thing I really appreciate is that Metro now prepares personalised shopping lists for me, which is great as I'm really not very good at picking out healthy food. So long as I keep my community points up I'll get the service for free.



One of the wellness sessions warned me that diabetes can make you lose your sight, so I go for annual eye screening to check for signs of diabetic retinopathy. It's all available at Metro, so really convenient.

Efficiency First



An increasingly individualistic, consumerist and fast moving world. Rapid innovation in energy efficiency and novel technologies have enabled a low-carbon economy with almost no need for changes in lifestyle or business practice.

The power of innovation has revolutionised the economy. A high-tech, low-carbon transformation is delivering dramatic cuts in greenhouse gas emissions while managing to sustain economic growth. Across the world, innovative business solutions appear to sustain the insatiable demands of eight billion people to consume more, grow richer and live longer.

The result is an increasingly individualistic, consumerist and fast-moving world. High levels of economic growth in the global economy for decades have only been interrupted by relatively minor downturns related to the availability of resources. Growth in the southern hemisphere has been particularly marked. But overall levels of growth mask a growing divide between rich and poor people. The world has seemed close to overheating for years, but somehow keeps going by developing novel efficiencies and more sophisticated ways of doing things — always adding to the complexity of systems. Some call this a golden age of technology and freedom, others call it a very shaky house of cards.

The UK has taken full advantage of the growth in the global economy. The brief recession in 2008-2010 prompted the **UK to invest more in knowledge and technological**

industries and this has helped it secure its economic future. Whilst not on the scale of China and some southern countries, it is pleased with the route it has taken. However not everyone feels the same and the riots in a deprived area of Birmingham in 2017, where 10 died, served as a stark reminder that not all UK citizens are enjoying the fruits of economic growth. The population is 71.7 million (up 18% from 2007) and over 65s account for 23% (up from 16% in 2007).⁶

What are the factors influencing the causes of illness and death?

This fast moving individualistic world means that many feel an increasing sense of alienation and **mental health problems** have been steadily rising. Special private mental health centres where people can come for several days of respite care are commonplace.

The **gap between the rich and poor** has been steadily increasing. In almost every country, including the UK, there exists an underclass that feels alienated and oppressed. These people are plagued by the age-old problems of obesity, depression and malnutrition. They are also those most likely to be affected by the climate change impacts of hotter summers and extreme weather events, more prevalent nowadays. However, with a growing private health sector, their access to healthcare is diminished and more rely on virtual self-diagnosis and prescriptions. This has created another layer of health problems from misdiagnosis, leading to even more serious heart and liver problems.

The private sector plays a greater role in healthcare in the UK and globally and this is blamed in many instances for the pressure to release drugs faster. Many **epidemics** have been attributed to the fast release of poorly-tested new drugs. It was thought that greater control would be put in place after the proteome personalised drug disaster of 2021 where 200 died, but it seems to have been quickly forgotten.

The push for more and more cures has meant that **people are living longer**. The diseases of extreme old age are more common and intensive palliative care lasts longer. Older people are often bankrupting themselves in their desire to have the latest life-extending drug or treatment.

Rising temperatures due to climate change and the urban heat-island effect, combined with a decline in exposure to the natural world, have led to a rise in the prevalence of respiratory conditions such as asthma.

⁶ This corresponds to ONS 'high life expectancy' projection (medium migration, medium fertility, high life expectancy).



What do 'services for the public good' look like?

The private healthcare system in the UK has flourished. Those who can pay, do so, to access the latest drugs.

Despite an expectation of greater centralisation, the push has been for more **specialised services to be offered locally**. Many old GP surgeries have become like mini-hospitals, offering an array of services and treatments. Services previously provided in hospitals, such as X-rays and ultrasound scans, are now offered in these local clinics. With technology constantly developing, much of the newer, more advanced equipment is still only offered centrally with people travelling in their electric or hydrogen car to access those services. Despite expanded local services many first appointments are with a virtual doctor as people are used to accessing services online.

This is a **quick-fix world**, whether for treatment and cure or prevention. Confidence in technology is high, and people take less responsibility for leading a healthy lifestyle, assuming that the consequences can always be dealt with by taking a pill or undergoing a quick operation. The latest diet books are no longer top-sellers; instead people opt for a surgical procedure or take appetite suppressing pills. People are also happy to have preventative operations to avoid health problems later.

People are more demanding, asking for specific treatments that they have read are effective and refusing to accept medical advice to the contrary. Conversely, patients can also decide to reject prescribed treatments, based on the information they have gathered.

For those who can afford it, the healthcare system is focused on you as an **individual**. Most people in the middle classes have their genome sequencing carried out and this, alongside lifestyle details and medical history, is used to set out what is needed on an annual basis. The wants and needs of the patient are often intertwined. As long as you're happy to pay, it can be accommodated.

Global economic growth, particularly in low- and middle-income countries, has meant that the UK is a less attractive destination for migrant labour. Public services reliant on large numbers of migrants, including the health service, have extreme difficulty in maintaining labour supply.

How has technology developed?

The emphasis on technological solutions to climate change has also **benefited the healthcare system**. New technological equipment and drugs are constantly being developed, mostly in the East, and consumers want to know 'how soon' they can get the latest treatments known to work. But the rapidity of new developments means that this is an expensive world for those involved in healthcare.

Bionics has been one of the main areas of growth in medicine, with the first bionic games inaugurated in Los Angeles in 2028. Bionic limbs have a far lower infection rate than the old strap-on limbs and many rate their bionic eyes as better than the natural eyes they replaced.

The development of **nanotechnology** has revolutionised medicine as predicted. Nanotechnology applications are now regularly used to kill cancerous cells, cure progressive diseases such as cystic fibrosis, allow hip replacements and pacemakers to be more successful, and enable the creation and acceptance of artificial organs. Many older people, in particular, opt for nano-implants to enable a gradual release of drugs, which helps to overcome side effects.

With the strides made in genetic testing, it is more common for fertile couples to opt for IVF treatment, in order to choose the 'best' baby. For those who don't, genome sequencing has meant that it's possible to cure genetic defects in advance. The advent of so-called **designer babies** is also creating a genetic underclass — natural babies who haven't had genetic defaults dealt with.

The development of genome and proteome technologies has led to the creation of **personalised drugs**. These are still only available in the private sector and still remain the preserve of the rich. Many of the middle classes feel disgruntled that they cannot access these expensive new drugs. Proteomics have also helped make Alzheimer's and heart disease less of the threat they once were.

Robots, rather than humans, often operate on those who do get as far as surgery. Such robots are able to perform more precise operations and their success rates mean people are often happier to see them rather than a human surgeon.

How does society allocate responsibility for healthcare?

Although people don't take much responsibility for their own care, many people are happy to monitor their health regularly with their home monitoring kit (or diagnostic T-shirt) with the slightest change sending them immediately to their virtual doctor. Many have delegated this responsibility to a selected health monitoring company, who automatically set up an appointment if they notice anything unusual. Pharmaceutical companies have extended their value proposition beyond that of the drug itself to a set of interactions around the drug, particularly for long-term conditions. For example, companies sell monitoring services that are tailored to individuals and their lifestyles, to ensure that the right drugs are taken at the right time. This is an effective way of building brand loyalty.

The **state has a different role to play in healthcare**. Alongside GDP the absolute amount of money spent on healthcare has increased, but with increasing technological developments and the need to purchase low-emission equipment and vehicles, the pressure on the state's healthcare budget is enormous. With the proliferation of private sector operators and most of the middle class opting for that route, the state healthcare system largely provides a more basic service for the underclass.

The role of state in healthcare has also changed somewhat. With regular new drugs and treatments being developed and made available, the state has found that its role in the regulation of health information and consumer protection has increased drastically. This has also contributed to the pressure on its budget.

What does 'Efficiency First' mean for the healthcare system in 2030?

Too complex to control?

Easy access to information and individual empowerment in this scenario could lead to confusion about where responsibility for the nation's health lies. Is it with the individual, who is happy to lead an unhealthy lifestyle safe in the knowledge that there is a drug or treatment available to deal with the consequences, and then self-diagnose and treat their doctor as little more than a supplier of drugs? Is it with a larger and more diverse private health sector? Or is it with the public sector service, emasculated though it might be?

This complex picture may be hard to regulate to ensure that people in general are healthier and happier, and avoid perverse outcomes or poor practice.

Are health needs being met?

Many of the people living in this scenario — at least those with the money — would rather take an obesity pill than reduce their calorific intake. Because the technology is available, they have the opportunity to lead long and active lives, but follow quite unhealthy lifestyles. And in a fast-moving and individualistic world, mental health problems could well persist without being addressed at root. Should the focus of a health system be on supporting lifestyle choice or wellbeing?

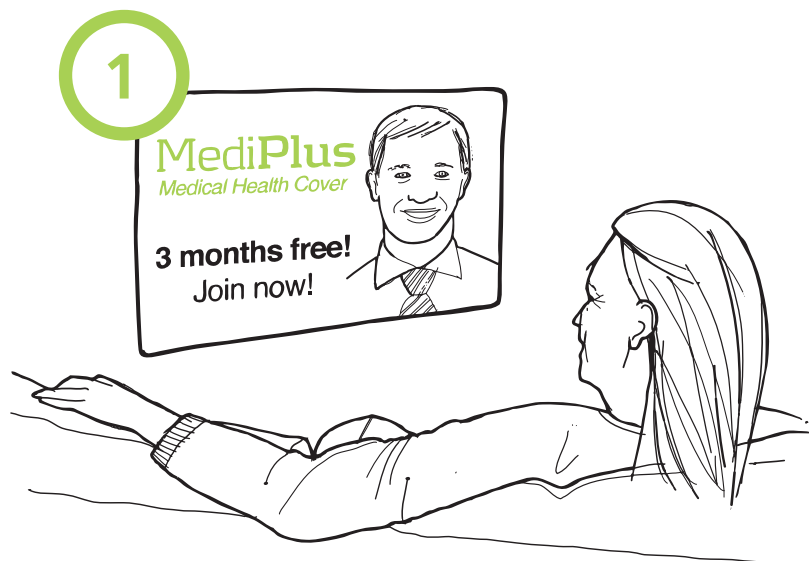
A two-tier system?

In this scenario, the burden of care for the health system has undoubtedly risen, and more money as a proportion of national income is being spent on healthcare, in particular because of the reliance on high-technology solutions. The public purse would still have a major role to play, providing the basic health safety net, but the balance of funds would have shifted towards personal private insurance. A much larger and more varied private sector would not just offer a single product to richer people but also develop very specific insurance products for very specific needs.

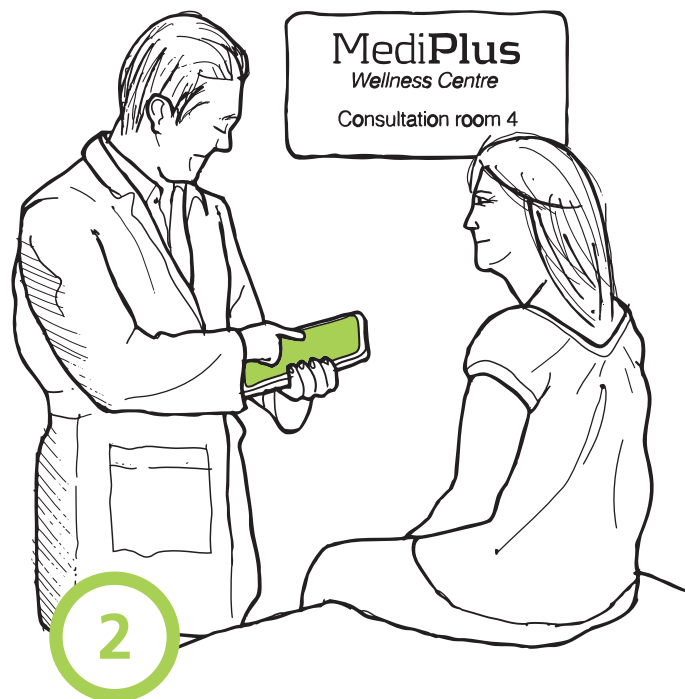


Efficiency First

Chris Johnson: 42 years old, female



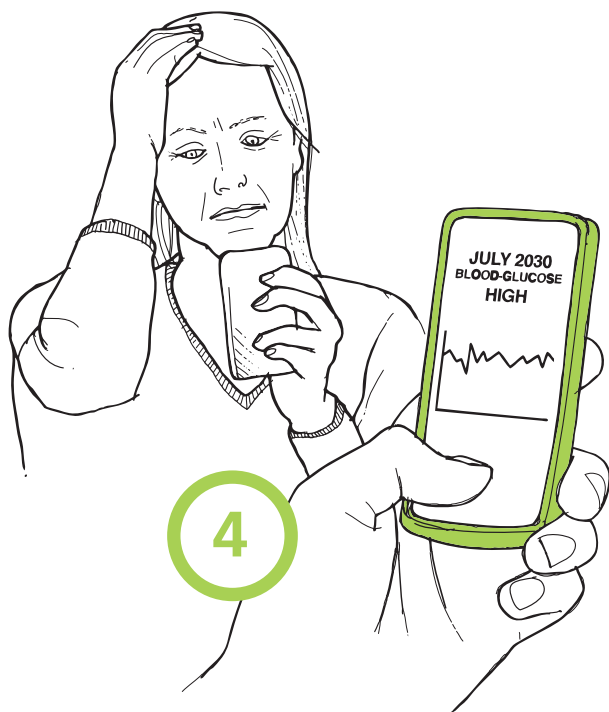
For years I've seen a lot of debate in the media about health, especially over how much it costs. Things have changed quite a bit since I was young. I decided to take out private health cover a few years ago to ensure I could get treatment no matter what came along.



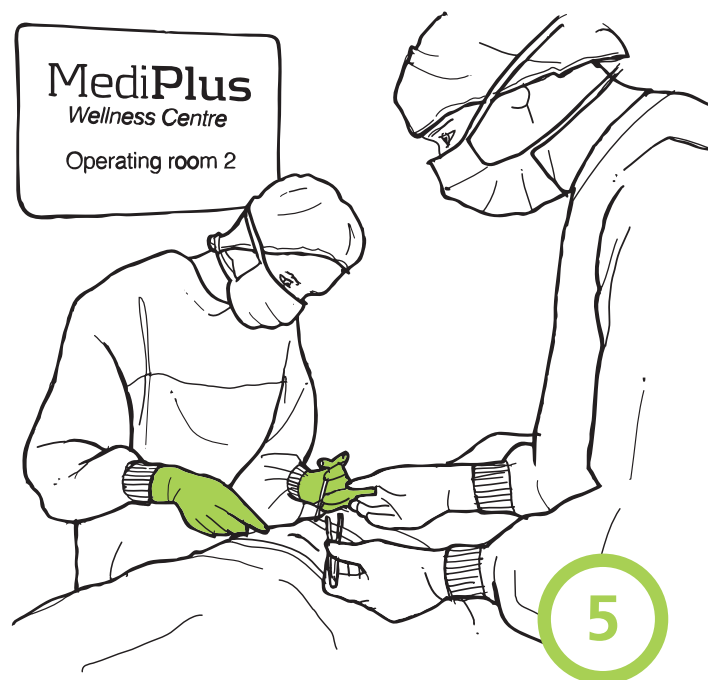
Two years ago I was diagnosed with diabetes. It was discovered during a routine visit to my local wellness medical centre.



Thank goodness I had my medical cover to pick up the bill, as diabetes is notoriously expensive to manage without cover. Some people have been really hard done by.



When I was first diagnosed I wasn't able to control my blood glucose levels at all! Changing my diet and exercising didn't seem to have any effect and I'm really not keen on taking tablets, having patches, or injections for the rest of my life. Mind you I don't want any further health complications in later life as a result of the diabetes.



I opted for the quick fix — islet transplantation. It was available under my health cover and the op could even be done at my local wellness medical centre. Now my diabetes is stable and under control.

I feel really bad about those who can't get this kind of treatment. I wish it were available more widely. I support my local 'Diabetes Support' group with time and donations but I'm not sure how much that helps.



My friend, Ashley, has never been able to afford private medical cover. He only discovered he had diabetes during treatment for various skin infections, when he had pre-operative blood tests. Because it was diagnosed late, his diabetes led to him losing his sight.

Redefining Progress



New priorities of 'wellbeing' and quality of life are bubbling up across the world as more sustainable forms of living become established.

This is a 'wellbeing economy' that highly values meaningful work, low-impact lifestyles, more time with family and friends, better health outcomes, creative educational experiences and a stronger sense of community. Countries prioritise economic and social resilience over the idea of economic growth.

During the global depression of 2009–18, new forms of living were born out of necessity. Individuals were forced to scale down consumption and prioritise meeting their immediate needs. Communities favoured local knowledge and looked to their own members to provide goods and services. As the world emerged from the depression, these new ways of living survived: from lower-impact lifestyles to advanced networks that informally provide for needs at a local level.

This is not a post-capitalist society — people work, consume and profit in markets. But citizens view money as a means to different ends and active governments tightly regulate the economy. Nor do communities experience isolation cut off from the outside world. Mindsets are intensely connected worldwide through global communications — different cultures learn from one another, and diverse faith communities find common cause in advocating simplified consumption patterns and more sustainable lives.

But happiness is not universal. 'Free-riders' — quick to abuse the goodwill of others — profit from collective agreements, plunder resources and exploit the vulnerable. In the communities hit hardest by the depression, many poor and excluded people remain isolated, shunning offers of support in a daily struggle to survive.

In the UK, the government has moved its policy focus in line with the shift in societal values. National indices of wellbeing — through the measurement of outcome variables such as healthy life expectancy, educational participation, social wellbeing, trust in the community — sit alongside GDP as a measure of the strength of the economy. The UK population is 72.9 million (up 20% from 2007), a factor of high fertility rates and continuing migration. Over-65s comprise 22% of the population.⁷

What are the factors influencing the causes of illness and death?

Quality of life is the key driver of economic and social activity, which has led to changes in people's lifestyles, eating and working patterns. This in turn has led to a slow-down in the rate of lifestyle-related illnesses. However, there is still a legacy effect from the beginning of the century so the children of Generation Y (those born in the early 1960s to late 1970s), now in middle-age, are still afflicted by Type II diabetes more than any generation before or since.

Citizens have adopted **slower lifestyles** leading to a large increase in walking and cycling and reduced reliance on cars. This has improved fitness and reduced pollution and, as a result, asthma and other respiratory conditions have reduced. Slower lifestyles and increased leisure time have also led to a **baby boom**, which is putting further pressure on per capita carbon reduction targets.

The government's measurement of **wellbeing** indices has led it to focus on health messaging around contentment and prevention. Primary prevention measures fall on receptive ears and have had a hugely positive impact on the population's health — health literacy is at an all-time high.

This focus on wellbeing and corresponding reduction of lifestyle-related illnesses means that communities take a dim view of what they see as **health transgressions**. People who smoke, drink excessively, and take little exercise, are increasingly frowned on by society. Some choose this approach deliberately as a counter-cultural lifestyle, though extremely high taxation on tobacco, alcohol and unhealthy foodstuffs make it a very expensive choice.

Another cultural shift has been a new outlook on **death and ageing** which growing numbers view as part of a natural progression in life. With much shorter working hours

⁷ This corresponds to ONS 'high fertility' projection (medium life expectancy, medium migration, high fertility).



across the workforce, and with state pensions worth very little in monetary terms, retirement either happens very late in life (in the early 80s) or for some people not at all. Some members of Generation X (those born in the early 1980s to early 1990s) have expressed a wish for their bodies to be left on a hilltop to be scavenged by wild birds and animals when they die, like the sky burials they saw in their Asian backpacking trips in the late 20th century. Authorities have now given permission for these on a case-by-case basis in Scotland, Wales and the Pennines. Woodland and other 'green' burial options are also increasingly popular.

People are increasingly interested in the **integrity of their bodies**. This has meant that organ and blood donations are at a worryingly low rate, although demand is slightly reduced due to an increase in the number of living wills in which people request that their lives not be prolonged unduly when quality has slipped below a certain level. Of those people who are still registered organ donors, there has been a trend for people to specify who they would be happy for their organs to go to; for example refusing donations to people who they see as health transgressors.

Although slower life and community living has led to some reduction in **stress** there are still great fears about climate change, and a perpetual worry that the next big environmental catastrophe could happen at any time and in any place. Some people find they can live with this level of uncertainty; for others the continual worry proves a burden on their health.

The type of **work** that people do has shifted away from desk jobs to more physical work. This has led to an increase in injuries and trauma, particularly from those switching away from office work for the first time in their lives.

Some people have struggled with adapting to the new direction that development has taken. This has led to pockets of **depression** and suicide among those who feel marginalised by the general changes in society.

What do 'services for the public good' look like?

The size of the **public purse** has diminished since the start of the century due to the protracted recession and the low levels of income and corporation taxes, and VAT, in this less consumerist version of capitalism. Matched with an expectation from the public that service delivery happens at the community level, the delivery of services for the public good has become increasingly challenging for the state.

Charities, including religious groups, have to a large extent filled the gap. With most members of the public routinely volunteering for up to 10 hours a week, much that was previously delivered by the public sector (such as street cleaning, parks maintenance and caring for the young and elderly) has been taken up by these groups, allowing the state to retreat to a regulating and co-ordinating role. The substantial increase in the number of active people among the retired population, especially those with professional skills and experience, has also strengthened this sector, although there remain isolated pockets where these services are very poor.

The **state** provides specialist services and facilitates access. The state also regulates the activities of businesses offering prevention and primary services in local markets. Some **specialised care** is only available at super-regional level in Europe. A pan-European health study showed that huge carbon efficiencies could be made through consolidation into super-tertiary hospitals. Other forms of care that were previously considered highly specialised, including some forms of chemotherapy, are now possible in the home. These effects have combined to lead to a substantial reduction in the number of tertiary hospitals in the UK.

The **pharmaceutical industry** has probably undergone the most radical change. Pressure during the recession to move to an open intellectual property regime undermined the previous business model and broke up the cartels. Unable to continue making the level of profits they were used to, the big pharmaceutical companies were eventually bought out by the World Bank in 2025 and now operate as a supra-national NGO under the auspices of the World Health Organization.

How has technology developed?

The **internet** is seen as integral to people's health. People's interest in maintaining their own health has meant that their first port of call tends to be their communities both local and virtual. Health groups have replaced book groups as a common form of leisure activity; many of these groups take place online in real time.

People own their healthcare information in the form of a virtual health **passport**, created at birth and updated annually via a health MOT, at which they are given advice on lifestyle and screened for early detection of disease. Private companies offer free online analysis of health passports and use the results to recommend products and services that the user might sign-up for.

How does society allocate responsibility for healthcare?

Individuals take a lot of responsibility for their own health. People reject the artificial (such as elective cosmetic enhancements) and embrace natural approaches and preventative measures.

In seeking health, people look first to their families and **communities** — in their neighbourhood, at work and online. Health service provision has moved towards early intervention near-patient care, with care often provided by charity and community groups.

The expectation on **businesses** to meet a clear social purpose and to keep their employees fulfilled and happy means that workplace health schemes are common. Health and safety officers are increasingly focused on the 'health' aspect of their job description, and are more likely to be giving out nutritional advice than safety warnings.

The **state** has an important role in maintaining equality of access to healthcare between communities and avoiding hypothecation of local taxes where there are particular interest groups in one area.

What does 'Redefining Progress' mean for the healthcare system in 2030?

A healthier society, but still lots to do

Despite the renewed emphasis on leading healthy, natural lives — something that would inevitably over time reduce the healthcare burden — there is still plenty to do for the health system in this scenario. Manual labour-related injuries are up, the elderly are suffering from a range of health issue hangovers from the 'bad old days', and a new baby boom means more ante- and post-natal care. To complicate matters, there is growing resistance to invasive or high-tech procedures.

A lack of coordination?

Much healthcare is delivered at the community level through friends, families and the voluntary sector. The centralised state acts as facilitator and coordinator, trying to maintain equality of outcome across what would no doubt be a very diverse picture from location to location. The lack of direct contact between the centre and the points of care could lead to a perception of the centre as remote and bureaucratic. There is a risk that insight into the state of the nation's health overall declines.

A cheaper way of delivering healthcare?

Health services in this scenario are likely to be funded centrally by the state, but with the possibility of local top-ups, perhaps through issuing bonds. Formal systems would provide traditional healthcare, with more informal systems active in prevention and long-term care. Healthcare could be cheaper to deliver as a result, in a sense 'saving' the current model of funding the NHS.

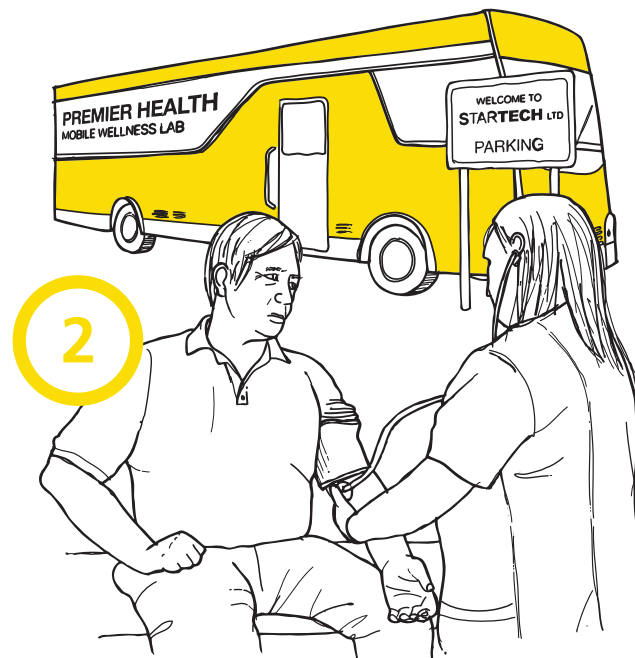


Redefining Progress

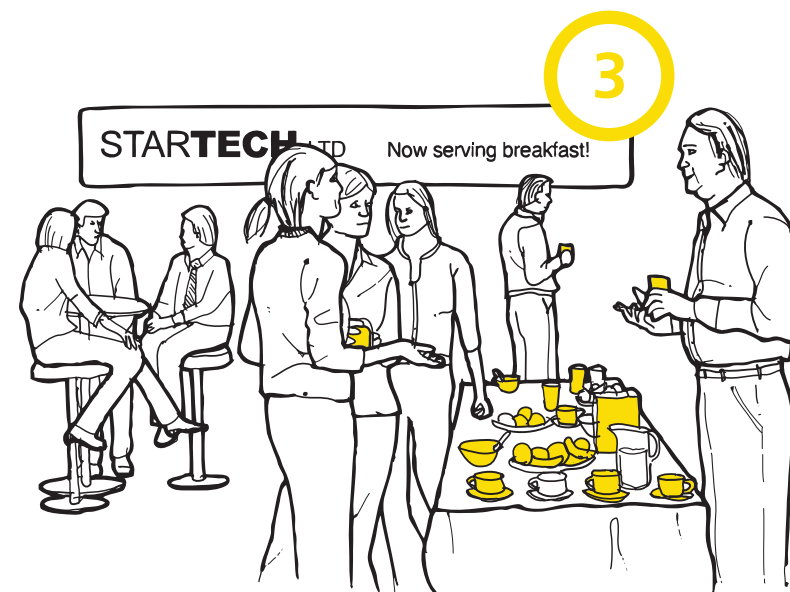
Chris Johnson: 42 years old, male



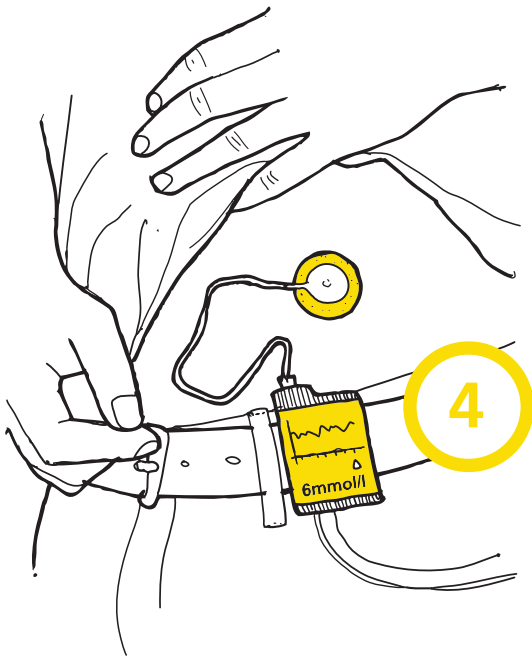
The company I work for runs one of those workplace health schemes that the government's been promoting over the years. We have an hour-long compulsory lunch break, for example. I usually use the time to go running round the building's grass roof track with a few of my colleagues.



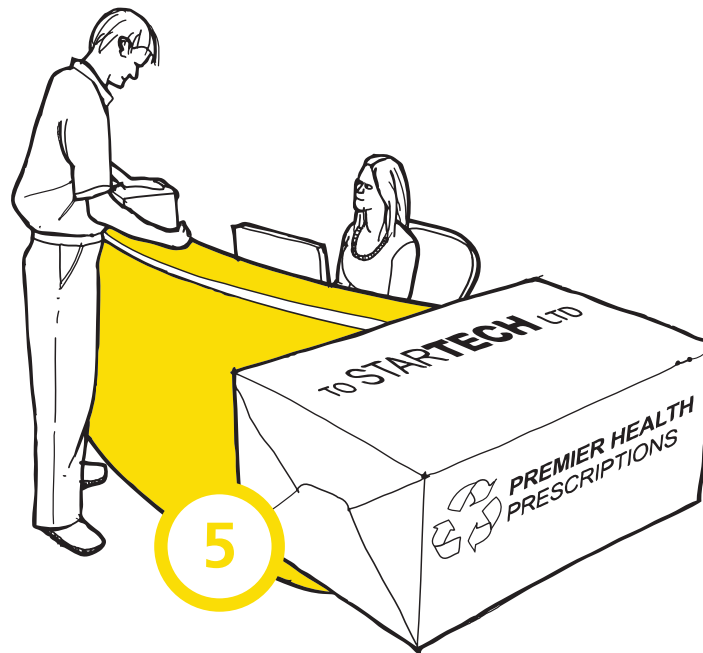
Another perk of my workplace health scheme is the annual health check. It happens on-site making it pretty convenient. Apparently it's more carbon- and cost-effective for StarTECH too. A couple of years ago one of my urine tests showed a high level of glucose — further tests confirmed that I had diabetes.



I already led a relatively healthy lifestyle but since being diagnosed I've worked even harder to stay fit and healthy. I now cycle to work, and this year StarTECH started to give the cyclists free breakfast — a great social time at the start of the day. I've lost a fair bit of weight already!



When I was initially diagnosed I chose one of those real-time continuous glucose-monitoring and delivery devices. It seemed much simpler to manage than the jet injectors, inhalers, patches, insulin tablets and whatever else. It maps my response to various glucose loads, monitors my exercise, and transmits data to my insulin pump, so that I get the right amount of insulin matched to my precise glucose levels.



It's all quite organised at work. All prescriptions for staff under the workplace health scheme are delivered direct to us in one go.

The scheme is also great for getting support and resources on things like how to lose weight, quit smoking and take up new forms of exercise. We get a lot of encouragement to use the company gym and roof-top and there are plenty of facilities and time set aside for staff to get the most out of various sports and leisure activities.



There are quite a few different ways that diabetes can be managed nowadays, and I think I'm quite lucky. My mate Ashley was diagnosed through one of the free five-year NHS MOT checks. He has to take an insulin tablet every morning which is free on the NHS but isn't specific to his real-time needs. He does monitor his blood-glucose levels but as it's not connected up to an insulin pump it's not very helpful.

Environmental War Economy



Tough measures have been adopted to combat climate change, pushing markets to the very limit of what they can deliver.

This is a world that woke up late to climate change. Efforts to broker a post-Kyoto agreement faltered, and instead, different regions of the world pursued their own priorities. But as the environmental impacts began to worsen, the world started to come together. In 2017 a global pact was signed, but even so, the global political community was forced into reactive strategies. Governments began to rely on hard policy to change how businesses worked and how people lived their lives. As time went on, the state adopted a stronger and stronger approach, rationalising whole industry sectors to reduce their climate change impacts, and even putting 'Carbon Monitors' in people's homes to watch their energy use.

Governments now push markets to the very limit of what they can deliver. In different ways in different countries, economies have been forcibly re-orientated to focus on dealing with climate change, in much the same way as sometimes happens in times of war. But in most cases this has developed gradually, ratcheting up over time. Citizens have surrendered control of their lives piecemeal rather than all at once, as trading regimes, international law, lifestyles and business have responded to the growing environmental crisis. And so in 2030, greenhouse gas emissions are beginning to decline, but the cost to individual liberty has been great.

In the UK the government has had to implement a tough **carbon-rationing** approach and the size of the state has grown in response. The response of the population is mixed: anger at the removal of democratic liberties is tempered by a general understanding of

the necessity of the action. While anger does spill over into periodic civil unrest, many communities have found strength in joining together and finding low-carbon ways to improve the qualities of their lives. The UK population is 68 million.⁸

What are the factors influencing the causes of illness and death?

The increased size of the state means that levels of employment are very high, though high levels of taxation and severe resource constraints mean that **levels of income** are much lower across all social strata. However, as resource constraints have affected everyone, **income inequalities** across society have been reduced, removing a lot of status-related anxiety issues.


One key impact has been on the **diet** of the population: importing food is too expensive due to the high levels of carbon taxation on freight, so the national diet is UK-grown, seasonal and reliant on low-carbon techniques. Food distribution is managed by the state, with a weekly ration delivery to households containing the elements for a diet described by the UK Secretary of State for Health & Wellbeing as 'dull but nutritious'. Lord Oliver of Clavering, the government food tsar, writes weekly recipes included with the delivery suggesting how to use the ingredients.

The healthier diet means that the rise in the number of new **diabetes** cases has slowed, and **obesity** is on the retreat, but there is annual scaremongering in the media during the February to May 'hunger-gap' when there is less produce available and the size of the delivery is reduced. To counterbalance worries of malnutrition with associated conditions such as rickets and scurvy, the government has instigated an annual therapeutic food distribution programme, targeted at pregnant and breast-feeding women and children under two, ensuring that those groups have access to adequate micronutrients and vitamins.

The **carbon-intensity of meat production** means that this has been almost completely phased out in the UK, with a managed transition down to vegetarian production in the years 2023-2026; years that are remembered fondly due to the glut of cheap meat on the market as farmers reduced their livestock herds.

The shift of production back to low-carbon agricultural and manufacturing techniques mean more people are engaged in **manual labour**, which has kept those individuals much

⁸ This corresponds to ONS 'low population size' projection (low migration, low life expectancy, low fertility), modified with an additional 1.5m population from inward migration.



fitter, but has also led to a shift in public perceptions of those jobs, with people reporting much higher levels of job satisfaction than in previous eras, again contributing to their wellbeing.

The public is bombarded with messages about the urgency and scale of the climate change problem, ensuring that this stays front and centre in people's minds, leading to a great deal of **stress** throughout society. One result has been an increase in **alcohol abuse**. Brewing of illicit (and extremely alcoholic) moonshine is common as a way to avoid taxation. However, the level of taxation on tobacco, coupled with lower incomes, means that smoking is restricted to the few remaining super-rich.

As in many other parts of the world, the UK has received a large number of **climate refugees** from Bangladesh, the Pacific Islands and parts of coastal Africa, bringing with them diseases new to the UK.

The extremely high price of oil has **reduced private car use**, and car ownership is back down to levels last seen in the 1950s. Many previously busy thoroughfares, such as Oxford Street in central London, have now been switched to allow trams, bicycles and buses only. This switch has had health benefits through a huge increase in walking and cycling, and a reduction in road traffic accidents.

What do 'services for the public good' look like?

The shift to an economic model of **state rationalism** has seen a huge growth in the size of the state and the number of government employees. Many of these are employed in sectors new to the government, for example in low-intensity food production. Public services are focused on **absolute necessity** with 'no-frills public services' the government mantra. Most transactions between the public and the state are carried out over the internet, allowing consolidation of local authorities into super-unitary authorities.

Much of the public discourse around 'doing your bit for climate change' has led to a resurgence of nationalism, which has led to many long-term immigrants returning to their places of birth because they want to do their bit there, rather than in the UK. This has had a huge impact on **staffing** with a shortage of nurses, laboratory technicians and other skilled staff. The unemployed and school leavers are being encouraged to fill this gap through a huge work programme, and the government believes it is on target to overcome the shortages by 2037.

Primary and secondary prevention services are seen as efficient from both a monetary and carbon perspective and are therefore the top priorities in government policy. For example the carbon intensity of being ill versus being vaccinated means that the government has made it no longer possible for people to opt out of vaccination. **Mass vaccination programmes** move street to street on an annual basis, ensuring that both children and adults have up-to-date immunity against a wide variety of illnesses, including flu and malaria.

How has technology developed?

As technology R&D is directed at climate change there have been **almost no breakthroughs** in health technology since 2020.

The **rationing of carbon intense services** and a switch to low-carbon provision where possible has meant that high-quality palliative care (of which much is provided by community groups) has replaced high-carbon interventions at the end of life, and organ transplants and life support machines are very rare.

How does society allocate responsibility for healthcare?

Just as in war-time, there has been a cultural shift towards a greater feeling of community. It is understood that the government's priority is climate change, and people feel united in that endeavour and perceive being ill as a drag on society. **Individuals** are therefore taking on responsibility for their health to a greater extent than ever before, and GPs no longer see those they used to call the 'worried well'.

Indeed the feeling of social responsibility means that **communities** have responded to the limitations of no-frills public service by banding together to care for one another, and in many places community 'care-banks' have sprung up. People willingly participate, as they know that the time will come when they will also need help.

The NHS offers a **limited menu of health treatments** to the frustration of campaigners who remind people of the promise of the early years of the century when it seemed anything was possible.

The combined impact of all these developments is that **hospital services** are much reduced, with most care being delivered at home and in the community. Carbon rationing

means that the carbon impact of all treatments is known and used in deciding which treatments to apply and where to treat — for example there are travelling services which take certain treatments to patients in their home, where this will have a lower carbon cost than treating in hospital.

As these changes have affected society equally, they have combined to have a positive impact on **health inequalities** because everyone faces the same limitations on what they can access. Limitations on travel overseas and similar responses to climate change in other countries mean that even the richest people struggle to find better care elsewhere or on the black market.

with minor complaints would often have no choice but to put up with them. Many people would be forced to live with discomfort, or worse. It is likely, however, that a grey market in healthcare would emerge: at one end of the scale, community-based care groups set up to fill the gap left by the retreat of the health service; at the other, trafficked drugs and poorly executed, unregulated care.

What does 'Environmental War Economy' mean for the healthcare system in 2030?

A no-frills health service?

The overwhelming focus in this scenario is on reducing greenhouse gas emissions as much as possible, as quickly as possible, and by practically any means possible. This would necessarily lead to a lower priority being placed on healthcare. There would be less money for expensive operations and carbon-intensive treatments. Staff would be encouraged to 'make-do and mend', reusing equipment more, where appropriate, and repairing rather than replacing anything faulty. In a centralised and state-driven world, the health system would also inevitably be funded by central government taxation, with little opportunity to channel funds or care through the private sector.

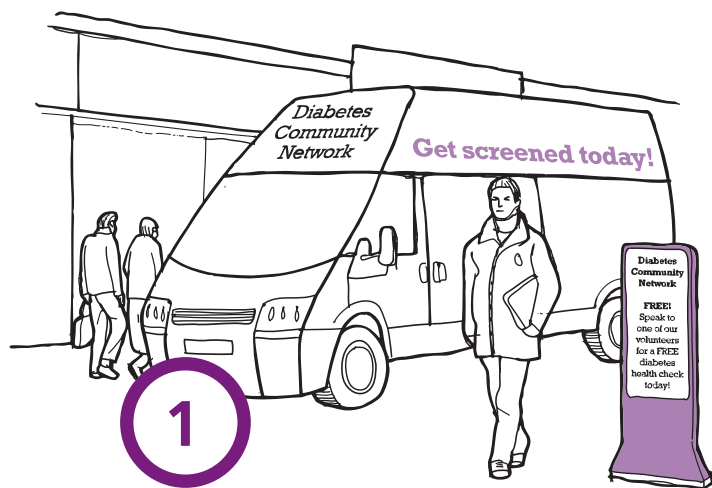
Grey market healthcare?

Due to a lack of funds, many conditions that are treated in 2009 would go untreated in this world. Resources would be directed first to life-threatening conditions, and people



Environmental War Economy

Chris Johnson: 42 years old, female



Hospital services are much reduced these days so we now have our own local care services, like the mobile diabetes screening van — it visits all the rural towns and villages in the area. The screening clinic is organised by the local diabetes network of volunteers and charities and the service is free, paid for by fundraising and sponsorship from local business.

Fortunately, I decided to pop in that day for the free blood test and following a couple more tests I found out that I have Type II diabetes.



After a few years I had to start taking insulin. I've been contributing to my local wellness programmes, facilitated by the community diabetes health network, so I continue to receive treatment for free.



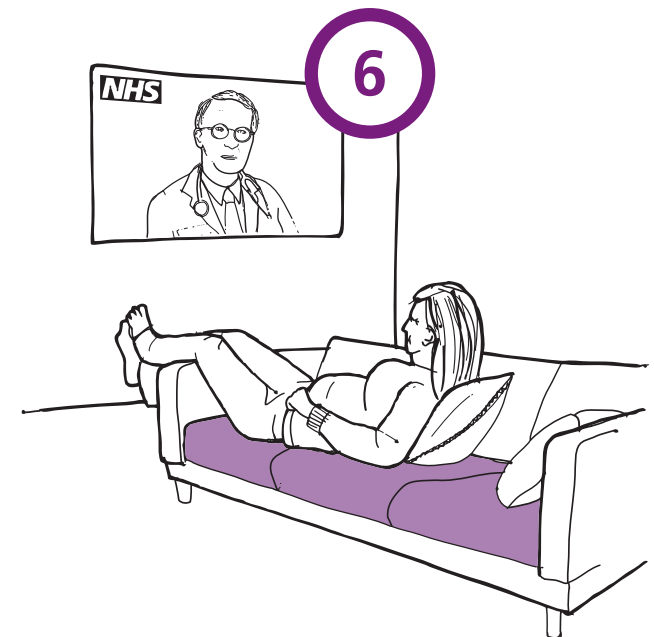
I'm glad I qualify for free treatment — there was one chap on the local news who didn't meet the 'healthcare rationing' criteria because of his unhealthy lifestyle. He couldn't afford to buy directly from the NHS so bought his treatment on the grey market. Unfortunately he ended up with counterfeit medication and he almost died.



I was hoping there might be some kind of cure for diabetes by now but health technology hasn't progressed in years — they still prescribe these active transdermal drug patches and they've been around for about 15 years now! It could be worse I suppose. The patches last for a week and deliver a once-daily dose of insulin. I think they're the most reliable and effective way to take insulin — there's much less wastage than with other methods, they contain lower drug loads and are much easier to use correctly. Thanks to the patches I no longer need to monitor my blood glucose levels either.



My official 'care buddy', Elsa was assigned to me by the community diabetes health network to help me manage my diabetes, and she's become a really good friend. We have plenty to talk about beyond diabetes!



I don't mind going online to use the NHS tele-health network, but I do wish sometimes I could actually sit down and talk face to face with a professional diabetologist. Of course, with all these resource constraints and shortage of specialists, there's no way I could do that!



5. Creating healthcare systems that are fit for the future

What should we do in anticipating the very different futures described in the previous section?

The four scenarios outline different political and social responses that the UK might make to the challenge of climate change in the next 20 years, and the implications these responses have for health and healthcare. The 'real' future is unlikely to mirror any of these exactly, though it is likely to contain elements from each of them at different times and places.

To build a healthcare system that is fit for the future, strategic planning needs to take account of a range of different possible futures. Climate change is the greatest challenge facing our society at the moment, but the NHS also faces a number of other pressures in the coming years including patient safety issues and shrinking budgets. This report argues that a low-carbon NHS is a more efficient NHS, and that if the service is to provide the best possible quality of healthcare in the future, it must build both its efforts to mitigate climate change and its resilience to that change.

Though each future scenario is very different, looking across all the scenarios we think there are five key steps to creating a resilient health care system today, whatever the future holds.

1. Support people in taking responsibility for their own health

In most of the scenarios we see people taking more responsibility for their own health: in 'Redefining Progress', 'Service Transformation' and 'Environmental War Economy', individuals take much greater responsibility for their own health and communities play a large role in providing care.

The factors driving this shift and the shape it takes are different in the different scenarios, but it's only in the 'Efficiency First' scenario that it doesn't feature, where instead people focus much more on choosing high-tech treatments. However, this leads to large degrees of health inequality so is not a positive element within this scenario.

Supporting the shift to greater personal responsibility will be important against the backdrop of declining budgets and a need for greater resource efficiency.

Empowering people to take responsibility for their own health supports a shift towards an approach that prioritises prevention. Improving health literacy of the population will create the conditions in which preventative techniques can flourish. Similarly, enabling communities to play a role in healthcare provision — for example with end-of-life care — could free up resources for acute care provision.

2. Build greater acceptance of ICT in healthcare provision

In all our scenarios ICT plays a major role in the delivery of healthcare. This is in the main due to high carbon prices, which make transport and carbon-intense facilities, such as hospitals, very expensive. There is an expansion of tele-health services which are likely to be cheaper.

Many of these technologies currently exist. They range from services like NHS Direct, and tele-care services for the elderly in rural areas, through to the possibilities of remote surgery conducted by robots.

But they are not yet as widely spread as in our future scenarios. The challenge is gaining acceptance — from both patients and clinicians — of such technologies as an acceptable form of healthcare delivery. Only by fostering such a cultural shift will the possible benefits from these technologies be realised by the NHS and its patients.

3. Work to find the low-carbon / high quality of life sweet spot

In both 'Service Transformation' and 'Redefining Progress' we see examples of where low-carbon living leads to improved quality of life. In 'Service Transformation' cleaner transport and industry leads to fewer respiratory complaints, in 'Redefining Progress' we see a focus on wellbeing which leads to a reduction in diabetes and obesity.

The NHS has been in a prime position to see the impacts of our carbon-intense lifestyles on our health and wellbeing over time, and much has been written about so-called 'diseases of affluence'.

The Service is also in a prime position, therefore, to take a leadership role in showing that low-carbon lifestyles can have a positive impact on our health. Working in partnership with other organisations — such as local authorities and businesses — the NHS can help find the low-carbon sweet spot in which a shift towards lower carbon lifestyles improves our quality of life.

4. Allocate resources to promote health rather than treat illness

Each of the scenarios provides a compelling case for the NHS and Department of Health to radically shift resources towards upstream prevention, rather than treatment, of illness.

High carbon prices in all the different 'worlds' put pressure on the public purse meaning that healthcare spend has gone down. 'Efficiency First' is the only one of our worlds in which GDP has risen, but even in that world the increased spend on technologies to deal with climate change means that there is little left in the public purse for healthcare.

The conclusion we draw is that even when the current economic crisis is over, the pressure on health service budgets is going to continue into the future.

Allocating resources towards prevention and promotion of health will save a lot of money in the long run and future-proof health services against long-term reduction in budgets. Currently the NHS only spends 4% of its income from taxpayers on prevention and public health.⁹ Our scenarios show that future planning should consider increasing this to a much higher proportion of healthcare spend.

5. Ensure the healthcare system takes a leadership role in the radical change we need to face climate change

It's clear from these scenarios that we all need to prepare for a radically different future and that business as usual is not an option for any organisation within society. As the world starts to adjust to the reality of climate change and moves to radically decarbonise, we'll need to find ways to break our dependence on fossil fuels for energy. Achieving this will lead to dramatic changes in everyone's lifestyle.

The NHS needs to play its role in this change: it can't assume that change is someone else's responsibility. With its massive size and reach, the NHS has the potential to play a leadership role and the ability to help shape the future.

The scenarios show that there can be positive health impacts from a proactive response to carbon reduction. The scenarios where carbon is reduced gradually — such as 'Redefining Progress' and 'Service Transformation' — are more positive from a patient and provider perspective than the dramatic reduction in 'Environmental War Economy'.

Just as GPs giving up smoking had a significant effect on smoking rates, NHS leadership on carbon reduction and climate resilience could be highly influential for the rest of society. Taking a leadership stance on this issue will require a cultural shift within the organisation to one where staff at all levels accept the likelihood of radical change and embrace it — and reframe climate change as an opportunity for the service rather than a threat.

⁹ Based on 2006/2007 figures.



6. How to use this report

Thinking about the future

The scenarios are plausible versions of different possible futures.

Reading them, you may think that none is very likely to ever become reality. But there are two things to consider before setting them aside and moving on.

Firstly, the future is uncertain. There have been countless events and changes in history that went unanticipated, and equally as many firm predictions that proved completely wrong. How many people called the recession of 2008-9? How many people confidently expected mobile phones to take Africa by storm in the way that they have? Elements of the scenarios may seem bizarre or contradictory, but the health system of 2009 might easily appear in a similar light to a visitor from decades in the past.

Secondly, the scenarios aren't supposed to be predictions. They explore possible future trends and events that could lead us in one direction or the next. To be plausible they should also be grounded in reality and knowledge about current trends and how they interact, and that is why they have been built in consultation with healthcare experts, and not simply conjured out of thin air.

Nonetheless, for the scenarios to serve their purpose as starting points for conversations about future plans, you will need to suspend your disbelief somewhat. Treat them as exercises in asking "What if?" Set aside scepticism for a period of time and use them to prepare for the future which — whatever it holds — will certainly be different from today, in unexpected ways.

Questions to ask

There are lots of ways of using scenarios. Here are some suggestions.

Use the scenarios to develop new strategies:

What are the risks and opportunities presented by each scenario and how can the risks be managed and the opportunities taken? What are the opportunities for you?

Use the scenarios to test your current plans and processes:

If current plans didn't change, would they succeed in all scenarios? Which scenarios would they succeed in, and why? What are the strengths, weaknesses, opportunities and threats

for your plans in each scenario? How could your plans be changed to be successful in a range of possible futures? Can you do the same with your policy, product idea or decision?

Use the scenarios to help form your own vision of the future:

Discuss what changes you would like to see in healthcare. Set objectives and an action plan to achieve them, and then test the objectives and action plan against the four scenarios. Or take the elements of each scenario that you like best, and use them to form a new, preferred scenario. Then ask what would need to happen for that scenario to come true? Who would need to do what, and when? How can you intervene to help?

Use the scenarios to stimulate partnership working:

Early drafts of the scenarios proved a lively basis for discussion among health sector stakeholders. They can be used as a way to frame discussions with other organisations within and beyond the sector to debate future collaboration — as a way of exploring common aims and identifying differences in approach, and for long-term planning. Ask what collaboration between partners could achieve in addressing health issues in the different scenarios? Identify which actions are common in the different worlds as a way of planning next steps.

Use the scenarios to fire innovation:

The scenarios are a useful test of current modes of service provision. Consider what services no longer work in the different worlds? Which modes of provision are most vulnerable to change? What new opportunities emerge as a result of considering different futures?

Use the scenarios for team/personal development:

How well equipped are you and your team to respond to these futures? What new skills and knowledge might you need? Which of these new areas of competence is common across the different futures? How should you prepare?

How to ask the questions

In most cases, these questions are best asked in groups, preferably in a facilitated workshop and using a combination of small group activities (usually one group per scenario) and plenary discussion. If possible, include people with different perspectives so they can share and discuss their views.

7. Appendix

Key questions used in the development of the scenarios

1) What are the leading causes of illness and death?

- Has there been an increase in asthma / allergies?
- Has there been a slowing in the increase of cancer rates?
- Has society solved the problems of alcohol abuse, tobacco, obesity, teenage pregnancies? Has there been a backlash against smokers, drinkers, and obese people?
- Has mental ill-health increased?
- What has been the impact on obesity?
- How are health services managing the health impacts of climate change?

2) What is the shape of public service provision?

- Has there been more integration of services?
- Has there been centralisation or decentralisation of services? Does this disadvantage those not in cities / centres of healthcare?
- What role does the private sector play in health services provision?
- Are public services (or just health services) outsourced abroad?
- Have businesses assumed greater responsibility for health impacts? As an employer? As a producer?
- What is the role of the pharmaceutical industry? Has its structure changed?
- What is the role of public services in food provision and procuring? What foods are available to use?

3) How does society allocate responsibility for health?

- Is there equal access to healthcare?
- Are there continued inequalities in health status? What has exacerbated / diminished this?
- Does healthcare have a more social focus (e.g. care)?
- How is society sharing responsibility for health care (e.g. among families, communities etc)?
- Is healthcare focused on prevention or cure?
- Do people manage their own healthcare treatment and diagnosis, instead of medical practitioners?
- Who owns your health information?
- Are food and nutrition a more integrated part of healthcare?
- Is the use of the natural environment more integrated into healthcare prevention and cure?
- Does the public trust new health developments?
- What is the general social attitude to older people? What are the demands of older people?
- Has there been a fall-off in immunisation?

4) How has technology developed?

- What has been the impact of nanotechnology?
- How is technology used to access healthcare?
- Has there been an increase in genetic manipulation to promote good health? Is there a genetic underclass?
- Has there been an increase in surrogacy / IVF to produce designer babies?
- Have we seen a move towards perfection (both physical and mental, achieved through genetic manipulation / cosmetic / other techniques)?



Forum for the Future — the sustainable development organisation — works in partnership with more than 120 leading businesses and public sector bodies, helping them devise more sustainable strategies and deliver these in the form of new products and services.

Our vision is of business and communities thriving in a future that is environmentally sustainable and socially just. We believe that a sustainable future can be achieved, that it is the only way business and communities will prosper, but that we need bold action now to make it happen. We play our part by inspiring and challenging organisations with positive visions of a sustainable future; finding innovative, practical ways to help realise those visions; enabling leaders to bring about change; and sharing success through our communications.

Project team: Zoe Abrahamson, Fiona Bennie, Anne-Marie Brouder, Helen Clarkson, James Goodman, Fiona King, Ben Tuxworth.

The Forum for the Future is a registered charity and a company limited by guarantee, registered in England and Wales.

Registered office: Overseas House, 19–23 Ironmonger Row, London, EC1V 3QN, UK.

Registered charity no. 1040519.

Company no. 2959712.

VAT registration no. 677 7475 70.

Enquiries: 020 7324 3630 or info@forumforthefuture.org



Design and illustration by Ian Dera

Printed by Park Communications on 100% recycled FSC paper (Revive 100 Uncoated)



Sustainable Development Unit



The Sustainable Development Unit (SDU) is part of the NHS. It is primarily focused on helping the NHS become a leading sustainable and low-carbon organisation. It achieves this by advising, creating and leading on policy which is designed to steer the NHS along a low-carbon pathway and be an exemplar public sector body.

Formed in April 2008 its first objective was to create a Carbon Reduction Strategy for the NHS in England. “Saving Carbon, Improving Health” was launched in January 2009 and sets out the NHS’s commitment to meet major reductions in carbon emissions in line with UK and international targets. The SDU is helping the NHS reach those goals by shaping policy and raising awareness across every level of the organisation.

Fit for the Future compliments the Carbon Reduction Strategy by highlighting the need for the NHS to be a good corporate citizen by reducing its carbon footprint. The NHS is responsible for over 18 million tonnes of carbon dioxide per annum, one of the largest public sector emitters of CO₂ in the world. It has economic and ethical obligations to reduce its impact on the environment not only for public health but for its own health and long term survival.

Project team: Hannah Greensmith, Fiona Head, Karl Heidel, David Pencheon, Sonia Roschnik, Sarah Wright.

The NHS SDU is based at Victoria House, Capital Park, Fulbourn, Cambridge, CB21 5XB

Contact: 01223 597 792

www.sdu.nhs.uk