



FUTURE
AT HEART

WHITE PAPER

THE FRONTDOOR OF HEALTHCARE

Rethinking the role of Primary Care in the digital age:
a white paper from NTT DATA

» PUBLIC HEALTH CHALLENGES

Public healthcare providers today are facing a series of challenges right across Europe, and the most urgent of all these concerns can be seen in Primary Care.

What are the most important pain points?



PROVIDING UNIVERSAL HEALTH COVERAGE

This is perhaps the most basic requirement of all for healthcare providers, and especially for Primary Care. As defined by the World Health Organization, UHC means ensuring that citizens can access good quality care in a timely fashion, and without suffering financial strain as a result.

In some developed countries, but definitely not all of them, this kind of service has been taken more or less for granted, but easily accessible healthcare provision is now severely under pressure. The pandemic has added to waiting lists, increased levels of debt in systems, added to taxation and direct costs to citizens and insurers, and it is not clear when all of these negative impacts will finally play out and something approaching normality returns.

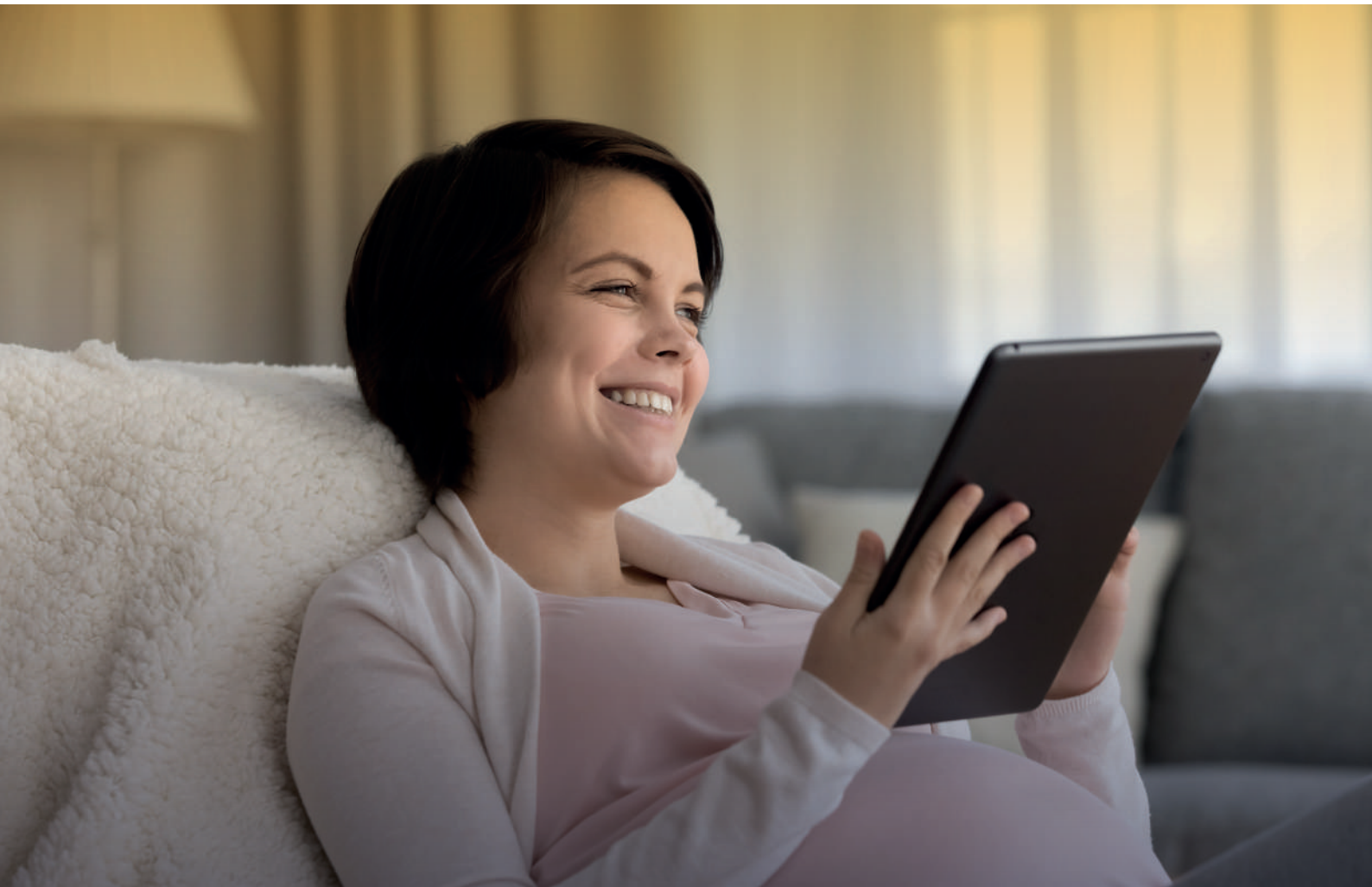
In any case, it is wrong to blame the pandemic alone for the pressures being felt across Primary Care in Europe and beyond. Systemic issues related to funding, aging populations and the fallout from social care issues are all making it hard to ensure that UHC access improves and the pandemic has simply amplified this.

NEED TO SHIFT FOCUS FROM TREATMENT OF ILLNESS, TO ILLNESS PREVENTION

Most European health systems do a good job in treating very sick patients but are much less successful in helping prevent citizens from becoming ill in the first place. There is a very clear need to improve performance in health promotion, focused on Primary Care, rather than in treating the problems caused by failures in illness prevention. In today's public health systems, the hospital has become the most important part of the public health service, and that leads to a range of unhelpful consequences:

- Without really effective primary care there cannot be effective preventive medicine, which inevitably means that pressure on health systems grows inexorably. Our countries, societies and communities miss the chance to cut off illness before it becomes serious enough to require hospital treatment.
- Primary Care often does not have a strong or clear enough role in health services. In most countries there is a shortage both of General Practitioners and Primary Care specialist doctors, and this is becoming more serious every year.
- As a result of that, demand rises steadily and not enough action is taken to reduce demand through consistent policies that are designed to improve public health.

Primary Care is proven to be effective in helping to prevent people from becoming seriously ill in the first place. It follows that funds and resources invested here will have the most positive impact on public health- yet virtually no health system in Europe gives enough attention to this vital area of activity.





LACK OF INTEGRATION AT ALL LEVELS

Our strong focus on hospitals makes it harder, not just to diagnose early and prevent illnesses from becoming serious, but to connect and integrate all other aspects of public health and social care.

- We can now see a much stronger emphasis on, and communication about this subject in recent years, which is a very positive sign. Despite this, we believe that a lot of work still needs to be done in making wellbeing a real priority in most health services.
- There is a lack of joined-up thinking about everything from nutrition to mental health to air quality to living conditions. Following WHO recommendations, we need to have a holistic view of human beings, to see them in the round: physically, socially and psychologically.
- Integration extends further than the purely human dimension, as well. The OneHealth concept sees the environment and all the species within it as an integrated whole. It explores the interactions and interdependencies between them and seeks a fruitful balance between them. The pandemic itself shows how easy it is for human encroachment on the natural world to enable cross-over of a virus from an animal species to humans. It is our interests to take the issue much more seriously.
- Social care is still often or normally seen as separate from medical care, which means that many conditions potentially treatable through home care or social security changes go untreated until they become emergencies (and are referred to hospitals).

LACK OF RESOURCES

Hospitals are very costly, and every action that reduces hospital admission saves a great deal of money from budgets that are under growing pressure.

- As citizen expectations about health and longevity rise, so the demand for costly treatments grows.
- New technology adds to the costs, to the point where it is becoming almost impossible for available budget to keep up with demand.

NEW CONCEPTS FOR PERSONALISED CARE

Advances in medical research are leading to a growing focus on treatments that are customized for individuals

- This is driving convergence between pharmaceutical and medical device companies for integrated care packages.
- These can be delivered from home but require low latency connectivity to operate properly.
- The result could be a cost-effective means of delivering added-value care, but is likely to be extremely disruptive to current monolithic healthcare systems.
- It is also one reason why we are seeing an increasing number of...



NEW ENTRANTS

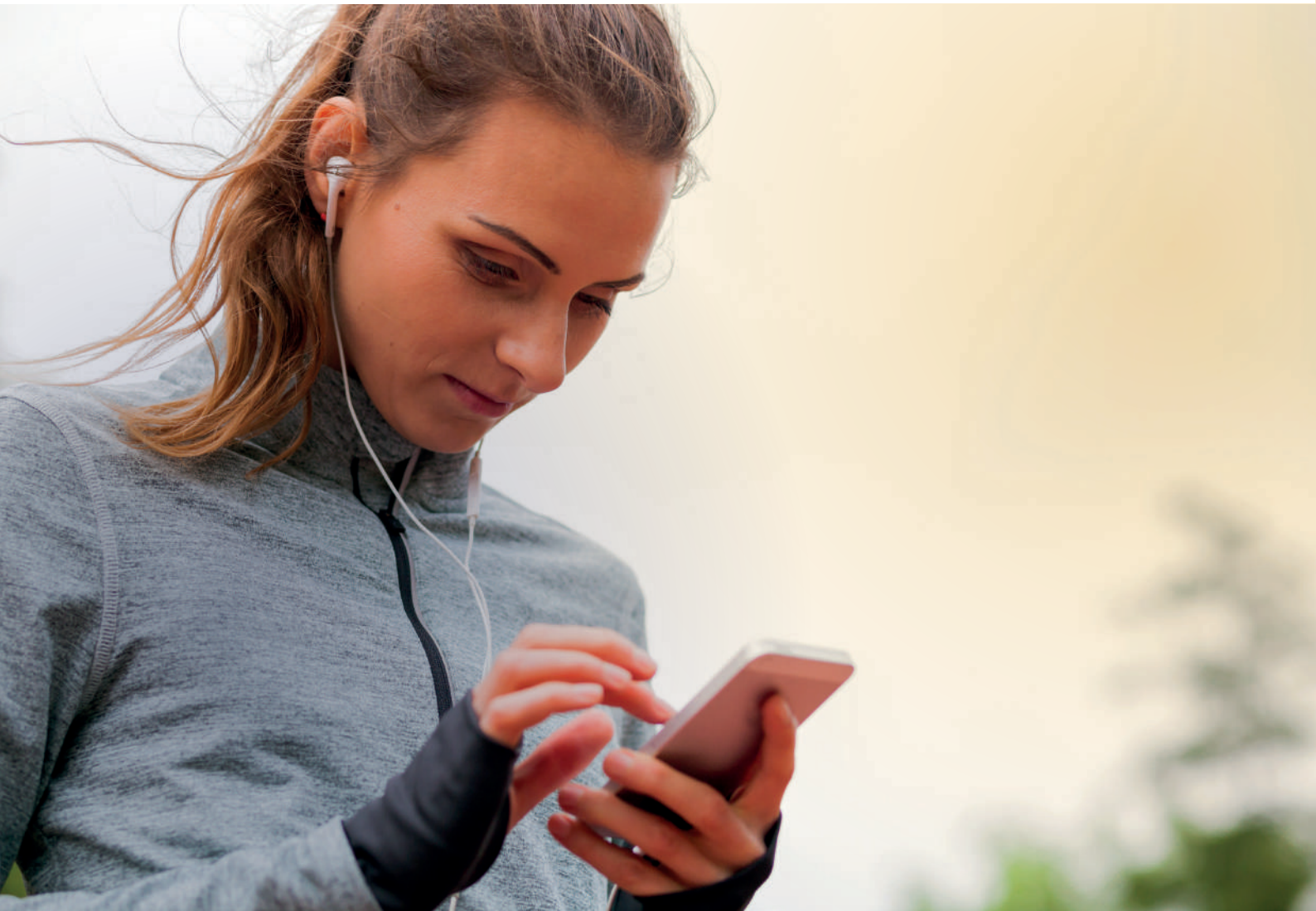
We are seeing a certain realignment of interests in European Healthcare systems, with new entrants from a range of different backgrounds.

- Insurers, global providers and technology companies combining to offer new value propositions that cannot be easily covered in current healthcare systems.
- The need for realignment of capabilities, as technology providers assume a more important role, especially in Primary Care.
- Growing emphasis on individualized treatments, together with interaction between innovative bio-pharma companies and medical device specialists to deliver personal treatments in the home.
- Use of data on a huge scale as a tool for research, traded as an asset by some government bodies in return for free or low-cost data-related services from global players.

This is not an exhaustive list of trends and impacts on the healthcare systems of Europe but it does suggest that delivery solutions which have lasted for decades are under growing pressure and are likely to require major change in the near future.

In our view, the greatest issues lie in Primary Care, and fixing these could prove extremely valuable to citizens, the wellbeing of their societies, the financial health of their countries and the long-term prospects for their economies.

The need for urgent change has been demonstrated by the Covid pandemic.



» IMPACT OF THE PANDEMIC

The pandemic has not told us anything that we did not already know about our societies (this means developed countries, focusing specifically on Europe). Yet it has shown up in the cruellest way the existing weaknesses and failings in our systems, and revealed how vulnerable our societies truly are to major emergencies.

We draw the following key conclusions from the pandemic:



PUBLIC HEALTH IS A CHALLENGE

Too many people across Europe have suffered and, in all too many cases, have died because their underlying health was poor.

- In most European countries there is a great deal of long-term/chronic illness within the population. This may undermine immune responses to any novel virus, leaving millions highly vulnerable to severe sickness and death.
- As a result of the pandemic, there is growing awareness of the need for rapid, effective diagnosis, leading to fast Primary Care treatment as a way of preventing illness from reaching an acute stage.
- Inequality has led to mixed outcomes, with some areas of every European country suffering far more than others, in many cases due to poor access to support.
- Lifestyle issues also mean that Europe went into this pandemic with poorly nourished populations, following decades of growing obesity and lack of awareness about preventive measures.
- By investing more in promotion of appropriate health behaviours, we can reduce incidence of disease, improve general quality of life and enhance the sustainability of the entire healthcare system.

PRIMARY CARE SHOULD BE GIVEN A HIGHER PROFILE

There is now a widespread belief that primary health resources may not have been deployed as effectively or mobilized as it could and should have been. Both medical researchers and politicians are now concluding that a stronger emphasis on Primary Care could have averted some of the most negative outcomes.

- Lack of monitoring and local awareness meant that too many easily achievable preventive measures were not taken, allowing the virus to spread further than it should have done.
- Poor connections between health and social care means that early intervention did not take place and, yet again, a full response only happened when a problem turned into a disaster.
- Local support, delivered by resources and capabilities “on the ground” was often by-passed in favour of centralized, government driven responses, leaving capable local people and organizations without an effective role.



FOCUS ON LONG-TERM CONDITIONS (LTCS)

Before the pandemic, there was a growing belief that healthcare systems would be most strongly threatened by the rise of LTCs, some of which are a function of longevity, but many are caused by lifestyle issues, such as obesity and diabetes.

- This issue has not gone away. During the pandemic it has been somewhat hidden by the impact of the Covid virus, but the relevance of LTCs and the need to treat as many of these without hospital admission remains.
- In fact, we are now understanding the close connection between LTCs and novel viruses, as it is clear that people whose immune systems are compromised by an LTC are more vulnerable to a new virus.
- The real message for us as a society is that we need to raise the standard of public health in order to reduce illness in normal years, while also making it possible to resist a new virus more effectively, when the next pandemic comes.

INCREASED RESILIENCE

One key lesson of the pandemic has been the need to build greater resilience into every aspect of our healthcare systems, starting with Primary Care. It has been both instructive and alarming to see how even apparently well-funded and managed systems have struggled with the extra caseloads, the shortages of vital equipment, the race to create new treatments, to support social care provision as pressures grew...

Scenario planning has taken place but the outcomes have generally been disappointing. Plans for pandemic management need to be revisited, storage of protective equipment must be completely revised and the role of Primary Care, as the natural touch point between the public and the healthcare system should be upgraded.

If the next pandemic proves to be more severe even than Covid then Primary Care across Europe and further afield must be prepared to respond faster and more effectively than they have done this time. This is an area of development that is becoming increasingly urgent.





» WHAT IS LIKELY TO CHANGE?

The experience of the pandemic has added urgency to processes of change that are already taking place in European healthcare. In most countries we can see policy-makers, social groups and clinicians coming together to seek ways to address underlying root causes for poor healthcare performance, and to drive improvements.

In the next ten years, we expect to see coordinated activity to achieve better levels of performance in all the following areas.



Reinforce primary care in order to:

- Reduce the number of serious illnesses that have to be treated in hospital.
- Improve treatment of long-term conditions.
- Enable a closer relationship between individual citizens and their local practitioners.

Prevent illness, promote good health by extending the scope of healthcare to cover:

- Healthy lifestyles, which means everything from nutrition to exercise, and make sure this is part of the Primary Care area of competence.
- Extend the scope of healthcare communication and competence to take in education and social care.
- Reduce inequality, in homes, income and environment, which is the greatest driver of poor health outcomes.

Unite social care with healthcare by bringing together traditionally separate disciplines and policy areas by:

- Making social care an integral part of Primary Care, as policies implemented here define life-chances, opportunities and living conditions.
- Covering the complete human life cycle in a connected manner, from early life (entering the education system) to end of life (palliative care), and at many points between.

Use data and information to drive positive change, because data is the key to successful change, if used with care, and with public support to:

- Monitor health indicators earlier and more often as a tool for improving illness prevention. We can only do that by asking citizens to provide defined and limited access to their data consistently.
- Do much better at predictive diagnostics, as that is the key to early interventions, thus preventing conditions from reaching the point at which going to hospital is the only possible outcome.
- Manage conditions more effectively in the community, reducing hospital time and making stretched budgets go much further, automated interventions driven by data analysis will be a non-negotiable factor.

All of these issues have a strong political dimension, so we will address the whole topic entirely from a technology viewpoint. Digital technology has a great capacity for enabling positive change, as long as the right social context can be agreed.

People need to trust technology in order to maximize its potential. We, in the technology industry, need to understand current concerns about uses of data and work harder to earn their trust.



» FIVE KEY FOCUS AREAS FOR DIGITAL HEALTHCARE



STRATEGY AND TRANSFORMATION IN PRIMARY CARE

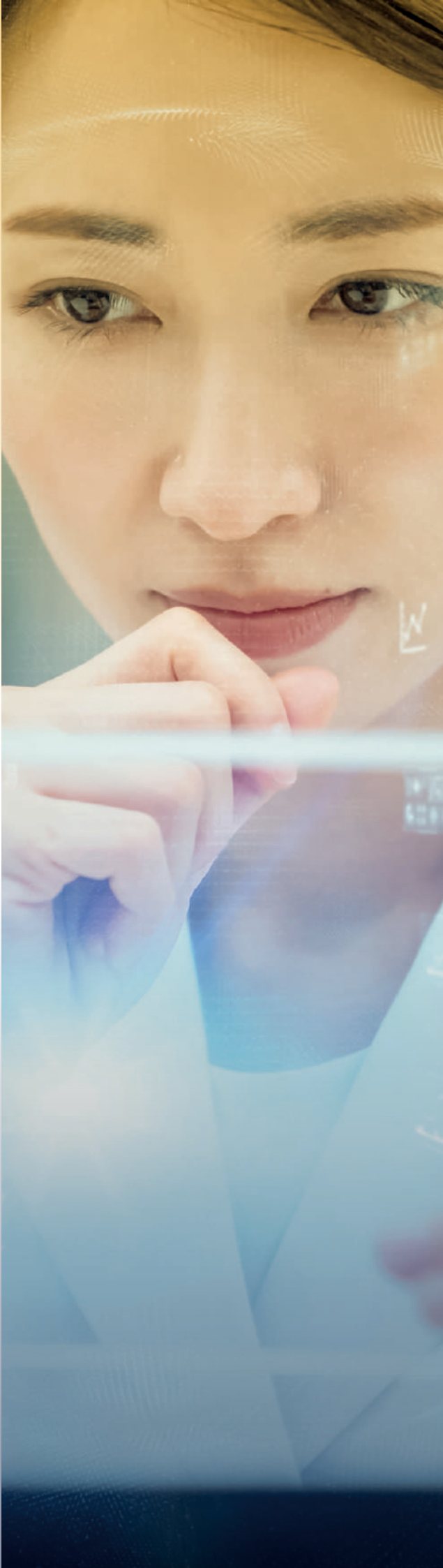
Digital strategy offers a growing range of potential benefits to healthcare but, like every other technology, it is only relevant and useful within a very specific context. For us, Primary Care is perhaps the most important priority of all. Technology alone solves nothing, and that is why NTT DATA sees itself, not simply as a technology partner, but as a **Digital Healthcare Partner**.

If you want to be useful to any industry, you need to show long-term commitment, backed by serious investment and a proven ability to act as a positive, well-informed partner. We as a company have an unusually broad range of expertise, which includes our specialist healthcare and Life Sciences Research and Development function, strong position in data analytics and acknowledged leadership in digital communications and low latency connectivity.

We have integrated these capabilities to build centres of excellence that work with healthcare professionals and providers to develop solutions for the most urgent challenges in healthcare today. We have identified five areas of specific interest and concern, and this is where we expect to help drive measurable benefits to healthcare providers, public bodies and citizens across Europe in the years ahead. These priority areas are:

1. Digital Experience
2. Digital Talent
3. Clinical Improvement
4. Operational Excellence
5. Data-Driven Healthcare

Let's take a closer look at them to review some of the underlying issues and identify some of the potential solutions that digital technology can help us develop.



1.

DIGITAL EXPERIENCE

Our goal is to build patient-centric communication solutions that prioritise illness prevention and enable integrated care across what are currently often impermeable administrative boundaries. Digitisation can drive a step-change in patient and citizen experience by:

- Improving proactive interventions, leading to more effective preventive care, based on the specific needs of individual citizens. We aim to understand what is happening in terms of physical and mental health, social condition, working lives of population groups and individuals, enabling better targeting and more effective health outcomes. Primary Care is the entry point for all healthcare requirements on behalf of the individual. This gives both a complete and rounded view of the patient and the duty to act as guide to the full range of constantly evolving options available.
- Develop a new range of channels both for interactive communication (including campaigns on healthcare education and specific health issues), together with healthcare provision. By implementing tele-monitoring (where required) and making it much easier to embrace tele-medicine, we can deliver better experiences to individuals and reinforce community healthcare models.
- As the pandemic has shown us, the need for effective but trust-based and anonymised tracking solutions will be of long-term value. These can deliver vital epidemiological data and enable community management of major disease outbreaks.
- Finally, and perhaps most important, these new approaches to collecting, managing and analysing data requires highly secure digital environments that enable data to be collected, analysed and used to drive healthcare improvements. In this context, Primary Care should have the priority role in managing the health data of the patients that they know best of all.

Data is the key to unlocking the benefits of digital healthcare, but data, as noted earlier, is the most contentious of all issues in this space. It is not enough to be a digital specialist: to be a real partner in this complex and politicised space, you also need to be a well-informed healthcare specialist, which has earned the right to be a trusted partner. That is our role.

2.

DIGITAL TALENT

The world of digital healthcare requires new skills and different attitudes, which will affect every part of the employee value chain, from recruitment to working conditions. Primary Care professionals also need to be given an appropriate level of respect and trust within this broader healthcare environment.

NTT DATA is one of the companies engaged in rethinking the ways in which roles, especially in Primary Care, may evolve in the next few years. This will involve a stronger focus on communication skills, digital capabilities and a sense of comfort and ownership over the emerging and developing technologies that are reshaping the healthcare world.

In developing digital talent, we need to focus on such issues as:

- How to attract people with highly-developed digital capabilities, and then how to enable them to keep developing their skills through enhanced training programmes, and to work effectively in a healthcare setting.
- That means redesigning and transforming the working environment, aiming to facilitate faster support and reduce stress, wherever possible.
- Interaction with the public is likely to evolve as part of this general process of rethinking health delivery in the digital age. We foresee a hybrid model, in which remote methods and face to face are combined within a single system to maximise resources and deliver care in the most convenient way.
- One key factor in making this approach work will be the drive to rethink organisational models, some of which date back to the 19th century, considering how to enable better interaction between professionals in all branches of health and social care.

To improve structures, interactions, ways to enhance and develop new capabilities requires a combination of digital leadership, true commitment to innovation and a deep understanding of all the factors that define how healthcare operates. Only by combining all of these capabilities can you deliver value to this, the most complex and important of all industries. Those are the capabilities we can deliver.





3. CLINICAL IMPROVEMENT

Perhaps the most complex and challenging of all applications for digitisation lies in how we can apply technology to improve clinical outcomes. Within Primary Care, digitisation will enable us to build a rounded, 360o view of the patient as an individual, and to monitor and manage their interactions with other professionals, departments, systems and treatments. This will make it possible to develop and evolve methods and systems of care that are preventive in nature, precisely targeted to each individual, and enabling more empowered and collaborative care.

Our contribution to this process of continuous research and improvement is focused on:

- How to develop next generation healthcare recording systems that enable record sharing across all clinical disciplines and social care, as well.
- Creating shared working (virtual) environments that enable full interoperability, not just at the technology level but in terms of semantics (common terminology), legal provisions, organisational and normative (based on common behaviours, rules and methods).
- The key goal here is to ensure continuity of care between all touch points and all levels of treatment and support.
- To deliver all of these benefits, while maintaining full public trust, we are investigating the use of Blockchain techniques (to ensure complete and accessible records, unbreakable value chains and equally unbreakable levels of patient confidentiality).
- We are also moving forward from our leadership position in data analytics to application of limited Artificial Intelligence for rapid decision-making (based on clear rules). Our expertise in sensor technology, low-latency connectivity and machine learning is informed by a clear position on AI ethics to protect patient interests.

Digital technology is not, in itself, capable of instructing clinicians on how to improve their own practises. Yet a digital healthcare specialist, such as NTT DATA, is perfectly positioned to provide insights and innovations that will drive improvements by enabling better-informed, more accessible decision-making, and a stronger flow of actionable intelligence. This is where we will add further value in the years ahead.

4. OPERATIONAL EXCELLENCE

The original and still, in many ways, the most important of all technology contributions to healthcare lies in improvements to operational efficiency. This is how we make limited budgets go further and free skilled clinicians to focus more strongly than ever on what really matters.

In Primary Care, we will expect to see significant rethinking of operational models, together with better coordination with other services. We do this by:

- Strategic consulting, working with health and social care organisations, government departments and a wide range of supplier to optimise their processes and improve joint working.
- Use advanced digital techniques, such as Robotic Process Automation (RPA), machine learning, analytics and increasingly AI to reduce the administrative burden, accelerate core processes and move skilled people away from repetitive tasks.
- Design and develop hybrid procedures to deliver the best available blend of human insights and decision-making with robotized, automated support.

Traditional IT has always claimed to provide the key to improved efficiency, but in the emerging world of digital healthcare, this is a more complex and sensitive process than ever. We are working to bring automated decision-making into key administrative areas to streamline processes and reduce costs. All of this in the context of deep healthcare understanding.





5. DATA-DRIVEN HEALTHCARE

This is potentially the greatest revolution in health and social care provision we have ever seen, and it must be handled with sensitivity, awareness and accountability at all times. This data revolution will enable Primary Care providers to build up a more detailed and complete picture of their patients, enabling them to create more effective health plans for each person. Our general approach focuses on the following three key areas:

- New forms of highly personalised treatments, which are targeted not just to groups of people but to specific individuals, using their own genetic data as key input. This is one of the most promising areas of medical research, but it cannot be developed further without access to patient data.
- Data-driven treatments depend on such activities as mass population screenings, following by analytical analysis, leading to individualised prescriptions. Making this a reality is not at all easy.
- To make this approach work we need to develop data-oriented models for managing strong governance and organisational structure.
- We also require operational transparency and constant scrutiny to build up the trust needed to gain regulatory approval and societal buy-in.
- Such an approach will need to be holistic, covering the entire value chain, from procurement to delivery.
- An advanced technology architecture, defining infrastructure requirements, together with data models that feed into products and solutions, while supporting decision-making.

As a digital healthcare leader, NTT DATA expects to play its full part in building the data models that will turn these core resources into real value for patients and society today, while helping to enable research breakthroughs for the future. We are committed to working with others in creating collaborative solutions, working with partners, government organisations and specialist groups.

Our goal is to identify key action areas in which our unique blend of skills and experience can add value to this collective effort, focusing on these priority areas:

INTEROPERABILITY IN SYSTEMS, SEMANTICS AND GROUPS

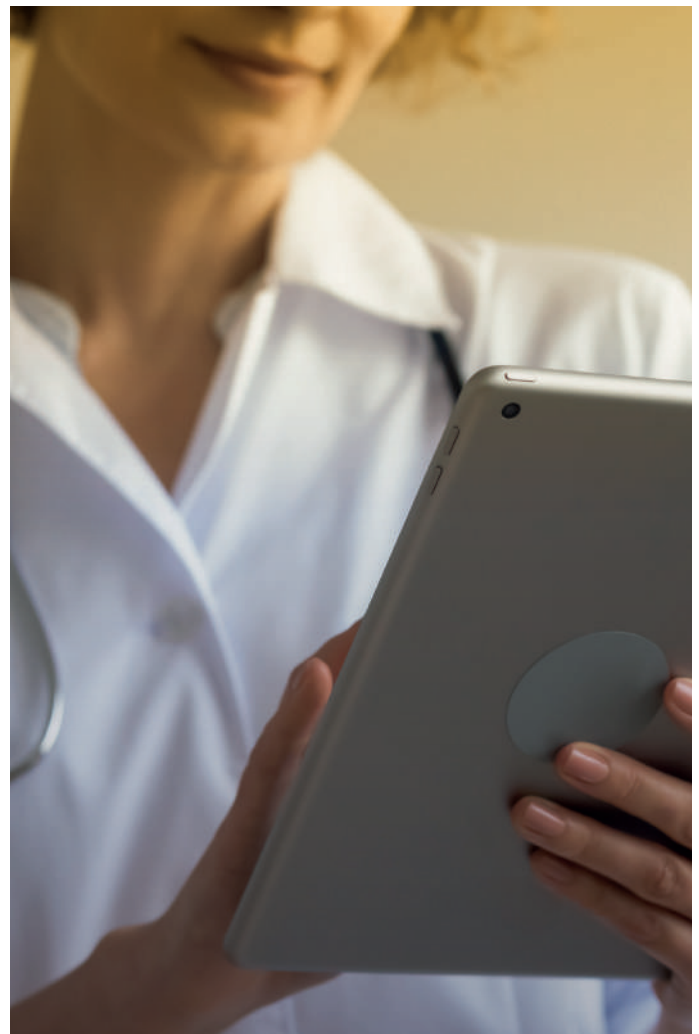
A common theme through this paper is the need to integrate systems and organisations at a deep level, including terminology, culture and policies.

- This is not a purely technology matter, of course, as the political will to do this has to come first, and experience shows how very difficult this can be.
- Making the decision to integrate (for example) health and social care, however, leads to the need for practical, technology-enabled solutions.
- Experience (often painful) in the recent past shows that building large-scale environments for integrated working is likely to prove costly, take a very long time and lead to operational challenges.
- Integration needs to take place on the Cloud model, with Open APIs used for secure and rules-based interaction between systems that are able to stay substantially as they are today.

BUILDING SEGMENTED, PREDICTIVE MODELS

As always with use of new technology to drive better outcomes in health, data is the key and Primary Care offers the best means to gather data when it matters most.

- To prevent future illnesses, we need to build effective predictive models, and that requires access to very rich data and use of analytical tools that are allowed to learn constantly and become more and more accurate.
- To give one example, a major missing component in most data models is the large group of people that have never been ill (so are for practical purposes invisible to the health service).
- Primary Care practitioners are the keys to identifying such people and encouraging data feedback from them concerning wellbeing, habits, and condition.
- This kind of highly detailed data model cannot be built except through trust-based relationships, limited by agreed rules and with defined targeted outcomes.
- General Practitioners (doctors) also need to pool and share data with social workers and educators in order to build a detailed and balanced picture of different segments in the population.
- Experience also tells us that different views into the same “data lake” leads to sharper and more varied insights. Sharing these helps us build a richer, more rounded picture of population health.



MANAGEMENT OF CONDITIONS IN THE HOME

One of the key components of Data-Driven Healthcare is the rise of customised, person-focused treatments delivered in the community. This will have a major impact on home-based care delivery and on the Primary Care practitioners responsible for this.

- Personalised treatments of this kind will be provided normally in the individual patient's home, with monitoring managed via low latency, cloud-based solutions.
- The most practical way to make this new approach work effectively is to manage on-site support services via the most local practitioner available, who will normally be the local GP.
- This approach will potentially unite pharma, medical device and cloud specialists with hospitals and Primary Care, assuming also input from social care and (possible) pensions businesses.

This last example shows how complex the landscape of future healthcare delivery is likely to become, with numerous specialist players, partnering in agile ways to deliver a vast number of customised and person-centric treatments.

Collaborative, disaggregated and cloud-delivered solutions will become more important, and it is essential that all public healthcare providers should be much better informed about what technology can and cannot do for them.



» FINAL THOUGHTS

NTT DATA is developing and improving core technologies likely to prove of vital importance to the future health services of Europe, and the world more generally. In particular, our telecom heritage (we are- among many other things- the 6th largest mobile telco in the world) means we are acknowledged leaders in development of what we think of as the next generation cloud.



This brings together “classic” cloud (scalable virtual datacentres on a vast scale) with 5G (for low-latency and almost endless bandwidth) to create a geographically distributed, intelligent and programmable network, with global reach and almost instant connectivity.

The cloud as we conceive it will enable creation of highly flexible work environments, in which disaggregated resources can come together as needed in complete security to manage joint projects, develop collaborative solutions and access private data in conditions of complete security.

This Networked Cloud is an ideal environment for developing and managing the advanced, innovative healthcare solutions that will become normal in the future. These will include:

- More comprehensive health records, accessible under controlled conditions but managed to ensure complete privacy for the individual.
- Detailed and continuously developing patient relationship management systems, which provide a private virtual space in which options for care can be tested and planned.
- More granular use of analytics to drive development of personalised treatments for individual patients.
- Potential use of AI to help Primary Care professionals build a care pathway that includes better diagnostics and enhanced care management options.
- True interoperability, in which all relevant factors, from technology to legal, can be managed holistically.

Primary Care has faced, and continues to face a growing number of challenges, and all healthcare systems have been tested close to destruction by the pandemic. There is a strong need to build more resilient and capable systems for the future, and NTT DATA intends to be a partner of choice in this joint development activity.



THE FRONTDOOR OF HEALTHCARE

NTT Data