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Health Matters

Summer 2016

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Welcome to Health Matters, our quarterly bulletin looking at some of the key issues facing health industries.

The only thing that is certain following the Brexit vote is that there will be a period of uncertainty. Across health industries leaders are having to come to terms with the implications for their specific sectors whether that be regulation, funding, workforce or a myriad of other issues. Discussions are beginning and plans are being formulated but, for all of us, it will take some time before we see how it properly plays out. We take a look at Brexit in two of the blogs in this issue and consider how the Pharmaceutical and Life Sciences sector and the private health sector might deal with the implications.

We also take a look at the issues facing the NHS particularly those around structure, finance and cash flow. The announcement that a number of Trusts and CCGs have been placed into 'special measures' has brought this all into sharp focus. We have set out, based on extensive experience, how organisations can deal with the short term cash issue and, in more detail, how we believe there needs to be a better balance between quality and efficiency.

Here at PwC we think that health matters – we all want better healthcare and we are all committed to finding ways to ensure better outcomes for everyone. I hope you find these and the other blogs within this edition of use.

Feel free to share Health Matters with your colleagues and contact newhealth@uk.pwc.com if you would like to join our mailing list.

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The NHS – embracing best practice in good financial management

The NHS is an institution we should all be proud of. Day in, day out, 1.7 million staff provide world-leading care to a fast-growing population with ever more complex challenges and higher expectations.

But the NHS delivers its services with a budget of 0.4% of GDP less than our European peers. For those working in the sector, the challenges of delivering services within budget are real.

And they're not going to go away: with the NHS looking at a £30bn funding gap by 2021[1] there is unprecedented financial stress in the system. The recent announcement that will relax the rules over waiting times, scrap fines for missing targets and place five trusts into financial special measures, underscores the magnitude of the challenge facing everyone striving to stabilise NHS finances and facilitate a range of wider changes.

The new measures are intended to help drive the deficit down after a £2.45bn overspend in 2015-16, but it's going to take strong leadership at a national level to transform the NHS in order to meet the funding gap. Although the challenges facing leadership teams keep getting bigger, there's much local NHS organisations and systems can do to help themselves and some of the new measures are intended to facilitate that. Local organisations aren't always fully in control of their own destiny but addressing their own organisations financial health and preparedness for change is possible.

Every situation is different, but there are some lessons we have observed that will resonate with all organisations facing some form of financial challenge:

- **Get the right leadership in place.** Strong organisations recognise they need people with the capability, time and commitment to lead and deliver financial recovery programmes, while also improving operational performance and the quality of care. In some cases this may require an injection of new skills and experience into existing leadership teams.
- **Find the underlying causes** that support the financial challenges, share these widely and gain buy-in to these factors before acting on them.
- Grip the organisation tightly, but safely, to ensure **discretionary spend is under control.**
- Build a **credible recovery plan** focussed on addressing the underlying causes, then act quickly to halt further deterioration; target short-to-medium term gains, whilst understanding what needs to happen to achieve long-term, sustainable change.
- **Communicate clearly to staff** about the extent and causes of the financial challenge and how they can contribute to achieving sustainable improvement.

Many organisations develop overly-complex financial recovery plans and often fail to grasp the basic building blocks of change. There are some critical first steps to either avoiding further decline or consciously planning improvement.

PwC's 'Road to recovery' report, is based on our experience of working with NHS Trusts and outlines these first steps and how to develop them. It is a contribution to an issue that will continue to dominate the lives of many local NHS leaders for many years to come.

Find the report here, 'Road to recovery' on www.pwc.co.uk

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1. Quarterly Monitoring Report 19, The King's Fund, May 2016.

What next for the NHS?

As Jeremy Hunt returns to his desk, Quentin Cole, PwC Health Industries Leader, reflects on the key issues facing the Health Secretary.

Jeremy Hunt has been running the NHS for four years now. He knows the Service inside out. There are many great things happening in the NHS. It has a fantastic workforce delivering world class healthcare and all around the country people are trying to do things differently, to use technology to improve both systems and patient care and to work with partners across health and social care to transform delivery. We have a health service with high levels of public satisfaction and one that is admired and copied throughout the world.

But there are also urgent issues that need addressing and that no doubt he will already be considering. The NHS closed last year with a deficit of circa £2.5bn. This year a large number of trusts are again forecasting significant deficits and many of these trusts are likely to run out of cash in year without support. A large number of organisations are missing key operational targets particularly in A&E.

Up until now there has been a heavy focus on quality to ensure standards are high and to continue to improve. While this is welcome, we now face a situation whereby the Service will undoubtedly have to take significant action in order to become financially viable. Deciding what that action is, and how it is carried out will be key.

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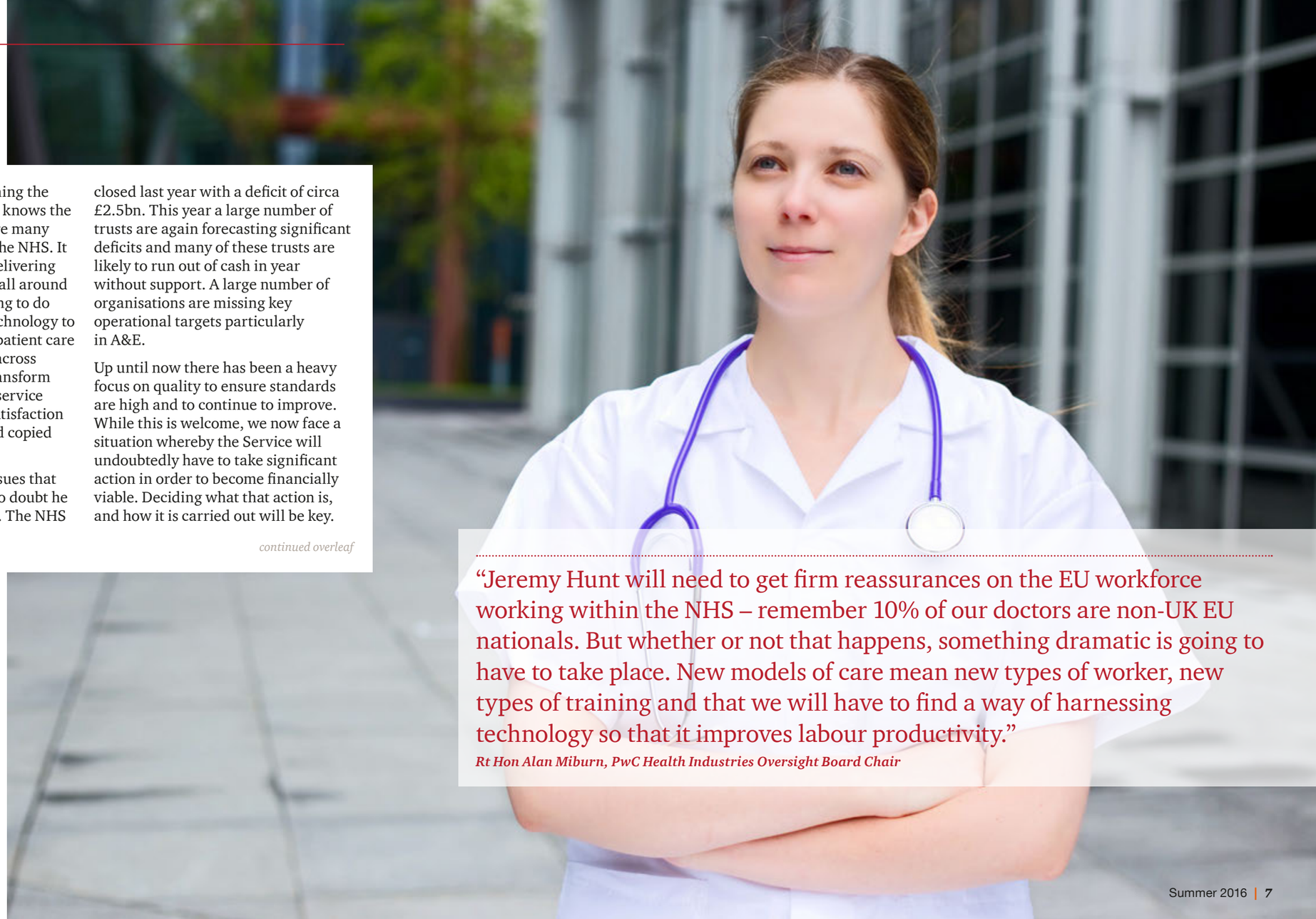
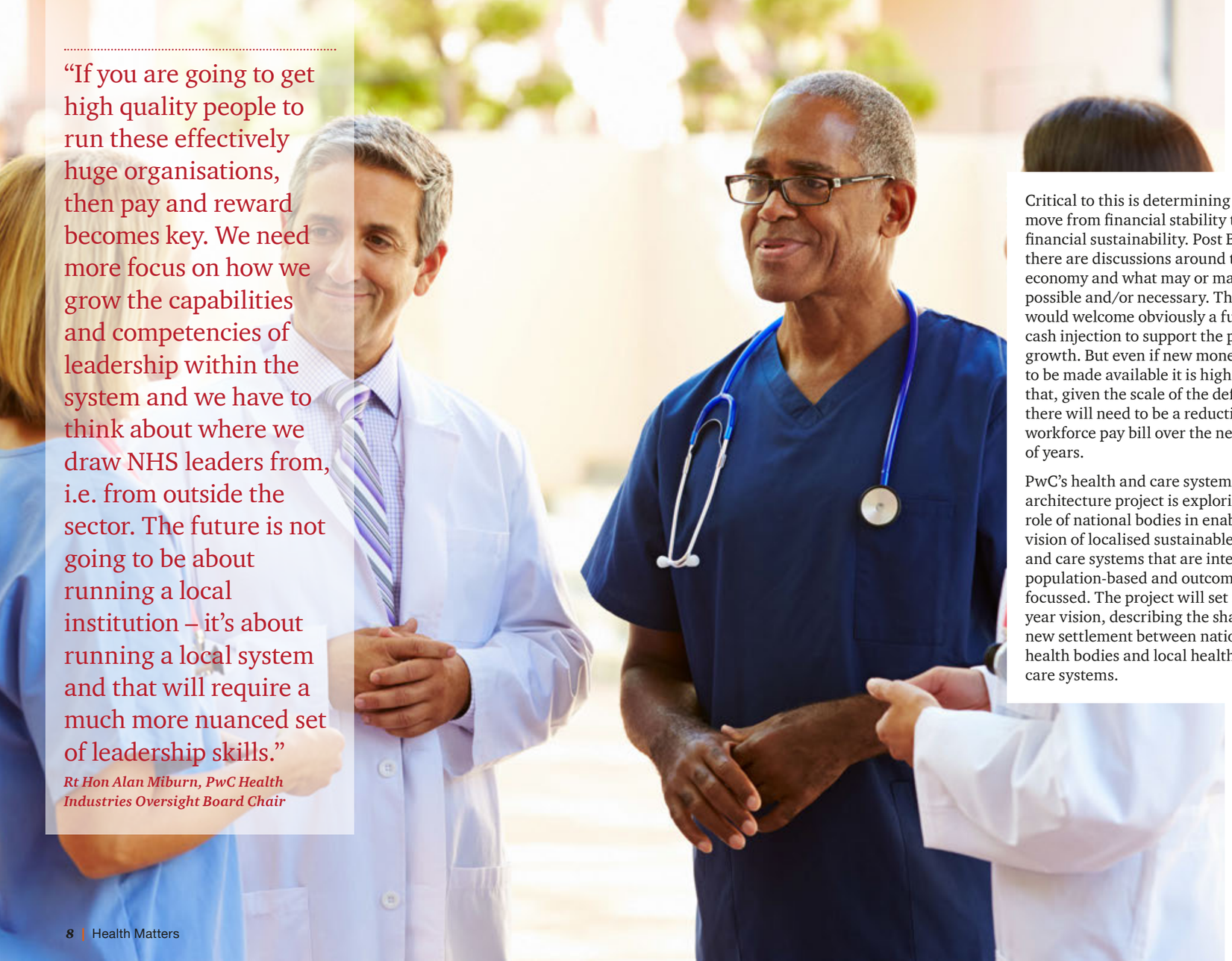


"Jeremy Hunt will need to get firm reassurances on the EU workforce working within the NHS – remember 10% of our doctors are non-UK EU nationals. But whether or not that happens, something dramatic is going to have to take place. New models of care mean new types of worker, new types of training and that we will have to find a way of harnessing technology so that it improves labour productivity."

Rt Hon Alan Miburn, PwC Health Industries Oversight Board Chair



"If you are going to get high quality people to run these effectively huge organisations, then pay and reward becomes key. We need more focus on how we grow the capabilities and competencies of leadership within the system and we have to think about where we draw NHS leaders from, i.e. from outside the sector. The future is not going to be about running a local institution – it's about running a local system and that will require a much more nuanced set of leadership skills."

Rt Hon Alan Miburn, PwC Health Industries Oversight Board Chair

Critical to this is determining how we move from financial stability to financial sustainability. Post Brexit there are discussions around the economy and what may or may not be possible and/or necessary. The NHS would welcome obviously a further cash injection to support the pace of growth. But even if new money were to be made available it is highly likely that, given the scale of the deficit, there will need to be a reduction in the workforce pay bill over the next couple of years.

PwC's health and care system architecture project is exploring the role of national bodies in enabling the vision of localised sustainable health and care systems that are integrated, population-based and outcome-focussed. The project will set out a 10 year vision, describing the shape of a new settlement between national health bodies and local health and care systems.

This work has raised questions around the role and function of the national bodies and how they work together in the best interest of the local care system. It is clear that the split between quality and finance is causing difficulties and needs resolving. There is also likely to be a need for a tier of management to replace the Strategic Health Authorities (SHAs) whether that be Sustainability and Transformation Plans (STPs) or something other.

None of these changes are going to be possible without incredibly high quality, motivated and sophisticated management. The changes the care system is going to have to go through are extremely complex. For that good management is critical.

It is not an easy task ahead for Jeremy Hunt and there are many things to consider amongst them workforce, structure and leadership. But we have reached a critical moment where action will need to be taken urgently and a new and different route taken. We need to get a better balance between quality and efficiency. It has been said that efficiency without quality is unthinkable but quality without efficiency is unsustainable. We need to make the changes needed to bring sustainability back into the NHS. He will need to lead from the front.

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"The most important thing is to give the NHS clear direction and clarity because clarity creates permission and then permission leads to action and hopefully the right behaviours."

Rt Hon Alan Miburn, PwC Health Industries Oversight Board Chair

Brexit and the Pharma & Life Sciences industry – there will be change

While the EU referendum result won't bring immediate change, the pharmaceutical industry faces uncertainty following the result of the EU referendum. We know there are daunting challenges ahead and future changes in the environment as a result of Brexit are currently unclear, but there are some areas that the industry needs to urgently consider.

Regulation

Throughout the life cycle of a drug, including after its launch, processes are guided by strict regulatory directives. While the UK has its own regulations governed by the Medicines and Healthcare products Regulatory Agency (MHRA), they largely mirror their EU equivalents. Currently the UK has significant impact on shaping these regulations and the future of this is uncertain. Clinical trials in the EU must comply with the Clinical Trials Directive and will soon be replaced by the EU Clinical Trials Regulation. This newer, streamlined regulation will apply from 2018 and aims to more easily facilitate larger pan-European trials. UK involvement in these trials may now become more difficult and costly if we are not part of these negotiations and discussions.

Market authorisation

The European Medicines Agency (EMA), currently based in London, is responsible for the centralised authorisation procedure for medicines which results in a single marketing authorisation from the European Commission that is valid in all EU and EEA countries. The UK may no longer be part of this process and the MHRA may be equipped to perform the same task. The extra pressure on the MHRA will potentially slow UK patient access to medicines and there will be a need to create solutions to mitigate this consequence.

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> "History has taught us that UK business is adaptable and innovative when confronted with new challenges and opportunities."
>
> *Ian Powell*

Workforce

The pharmaceutical and life sciences industries directly employ 73,000 people in the UK, approximately 7% of whom are non-British EU citizens. Restrictions on freedom of movement could potentially cause a short term decline in productivity. Many academics and senior pharmaceutical staff who frequently move around Europe could be affected and companies may be considering how to lessen the impact of a possible brain drain out of the UK.

Funding

UK life sciences has access to a wealth of funding initiatives in Europe, including Horizon 2020 and the European Investment Fund. In fact, as of 2011, the UK was the beneficiary of 16% of the funding from one such initiative, compared with our contribution to the EU of 11.5%. Brexit may not preclude all access but it may restrict the UK's access to these funds. The UK could also struggle to promote itself as a dynamic market for investment as it may no longer be a gateway to Europe. Foreign investment in UK life sciences, from the US for example, has often been with a view to access a wider European market.

We will have to see how some of these issues pan out. But for now there are some key things companies could consider doing:

- **Communicate** to your non-UK nationals to reassure them that they are valued. Consider sharing guidance on applying for permanent residency.
- **Be prepared** to answer questions from your investors – how may existing funding be affected and do you have alternative funding in place?
- **Review** your regulatory and clinical trials strategies to determine if they will work under the different Brexit scenarios and timescales?
- **Begin to plan** for uncertainty: consider scenarios for Brexit in the key areas of regulatory, labour, investment and fiscal then identify risk mitigation strategies and ask yourself "are we prepared?"

As Ian Powell, PwC's former Chairman has said *'History has taught us that UK business is adaptable and innovative when confronted with new challenges and opportunities.'* I am sure this will be true of the UK pharma and life sciences sector.

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What does Brexit mean for UK healthcare investing?

As the dust starts to settle and we get back to work, everyone is considering "how is Brexit going to impact me and what I do?"

As healthcare investors and advisors, we need to think carefully about how Brexit will impact the healthcare providers that we invest in and work with both over the short and the long term and consequently what this means for the deals that we will see.

The first and most important point is that the healthcare demand is fundamentally not linked to Brussels. The demographic and disease trends continue today as they did last Thursday and they will continue as predicted far into the future. How this demand manifests, and where it presents however, may shift according to the economy and the wealth of individuals and the Government.

Clearly any potential economic downturn will impact Government funding and thus potentially prolong or deepen the austerity measures that Local Authority or NHS funded care providers have been operating under for the last few years. Greater control on eligibility, changing care models and difficult fee settlements could prevail.

Under this scenario, as we have seen in recent years, rationing of government funded health and social care could lead to an acceleration in the private pay markets as individuals put their hands in their pockets to access the care they need and want. Individuals' wealth will potentially counter this driven by both reduced income and a potential reduction in asset values (house prices as an example).

Interestingly, when the economy suffered in 2008/2009 there was a surge in activity within Private Medical Insurance (PMI) funded private hospitals as people who were potentially concerned about employment "made the most" of their PMI cover.

There is also the prospect of the UK becoming an attractive place to "fly-in" to for private medical care. London is already a world centre for international patients. With the weakening of sterling, this could make it an even more attractive destination for those seeking world class private healthcare.

Undeniably though, the greatest impact that the sector is going to face is on workforce. The impact on nurse numbers is likely to be minimal as any potential decline in EU nurses could be off-set by recruitment from further afield. However, 10% of NHS doctors are EU nationals and the current restrictions on doctors from the rest of the world are minimal. We could therefore be facing a further pressures on doctors within the NHS, compounding current staffing problems.

...the greatest impact that the sector is going to face is on workforce.

Longer term, the impact on nurse numbers is likely to be minimal as any potential decline in EU nurses could be off-set by changes to immigration rules allowing more recruitment from elsewhere. During any transition period, increased recruitment issues compounding current staffing problems are a risk.

The outlook for doctors without a deal on free movement of labour is more challenging. 10% of NHS doctors are EU nationals, developing a larger UK workforce would take many years and the new junior doctors contract will not help with broader overseas recruitment.

Arguably the most impacted part of the workforce is likely to be the carer population, individuals working in care homes and in people's homes, taking care of the most vulnerable members of society. 5% of this workforce is currently from the EEA and recruiting workers to the care sector from outside Europe is challenging under current rules. In the longer term without free movement deals, the care sector is likely to struggle to recruit and retain staff. Will this lead to higher wage bills, higher fees, decreased margins or a combination of all three?

From an M&A perspective, UK investors are likely to retain their positive view on UK healthcare investing having operated in this dynamic and ever changing market for decades through growth and recession. However, with the weakening of Sterling, will we see an increase in foreign investors into the UK as they look to "bag a bargain"?

It is too early to predict a lot of the above but the fundamentals remain – health and social care markets are resilient, operators can succeed in even the toughest environments and investors have become and will need to be more astute than ever.

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Under the microscope:
The recent healthcare deals market

Looking back over the last year, deals in healthcare have been driven both by changes in the wider environment, and specific trends within the sector.

At the global level, the most obvious factors are demographic and social change. In developing markets like India and China the priority is capacity building, with the state looking for cost-effective ways to deliver basic healthcare to people who have limited or no provision at all. Both the established healthcare businesses and new entrants are exploring how this can be done digitally, for example, through mobile phone apps and remote consultations. And as the middle class grows, opportunities are opening up to provide more choice to those who are able to pay for it. India is also developing into a 'health tourism' destination, with people travelling in from countries like Malaysia, Russia, and also from the Middle East and Africa to have treatment there, driven by a low cost, high quality, provider base. This in turn is making Indian businesses attractive to overseas operators and to PE houses, for example IHH Healthcare Bhd, the Malaysian hospital group, acquired a majority stake in a Hyderbad based group for $200m in August 2015 (following a $45m investment in another group in March 2015). You can see the consequences in the rising size of deals in India, with the average up from around $15-20m, to $70-120m since 2010.

In developed markets, populations are ageing, and that's bringing with it a whole range of healthcare challenges, from the need to provide aged and dementia care, to a greater prevalence of chronic conditions like diabetes. This is driving the continued interest in the care home sector, for example, especially from property investment companies. We've also seen deals designed to achieve economies of scale and reduce costs, either through the consolidation of a platform (as in the High Street optical market in the UK), or the replication of a care or treatment model, as with Acadia Healthcare's acquisitions of Partnerships in Care and, more recently, Priory, and UHS's acquisition of Cygnet and Alpha in the UK.

It's generally easier to achieve such synergies in services that are 'one step removed' from patient care, such as imaging, diagnostics, or lab testing. Hands-on care is much harder to scale up, especially across borders and regulatory jurisdictions. 'Horizontal integration' between providers is likewise more common in markets where there is universal healthcare provision, like the UK. In markets where provision is not provided free by the state, some of the focus has

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been on vertical integration, with insurance companies acquiring providers to help reduce costs and control quality more closely, for example.

Quality has been a factor in a number of other recent deals too. Chinese buyers, in particular, are using M&A as a quality strategy, acquiring overseas businesses as much for their expertise as their business or their brand. This is a trend that extends to other sectors too, and not just healthcare.

Turning to the dynamics within the market, and there's activity across all the different segments: corporates and PE houses are still active buyers, and governments are exploring PPP deals (there's particular interest here from authorities in the Middle East, where public sector budgets are under pressure, as a result of the low oil price). There continues to be a lot of corporate and PE money in the US looking for a good home, and some US players are investing in the UK, on the grounds that it's a similar market, but slightly less saturated (as noted above with Acadia and UHS). We've also seen increasing cross-border activity within Asia, some of it driven by regulatory changes in markets like Thailand and the Philippines, where barriers to foreign ownership have now been removed. All in all, we expect the number of international deals to keep on rising, especially in core services such as hospitals.

Private Equity: What do they look for in healthcare?

PE houses have traditionally seen healthcare as an attractive investment. It's a necessary service and a stable sector, which has seen insolvencies much more rarely than other sectors; the returns may not always be as high as other sectors but they're predictable and resilient, and demographic trends mean that demand can only rise. Likewise, in many markets, the provision of healthcare is fragmented, which continues to offer up opportunities for consolidation, cost-savings and operational synergies, which is the PE sector's stock-in-trade. On the downside, some PE houses can be wary of investing in a sector where the challenges can be extremely sensitive, and investments can be severely damaged by medical mistakes or negative media coverage. The fact that state budget cuts are putting pressure on fee levels, in areas such as social care, is also an issue, though more so for PE houses that already own these businesses, rather than for new acquisitions, where the funding expectations will be priced into the deal.

So taking it all together, healthcare is a steady investment for PE, although there will always be the possibility of super-returns, for example in the digital segment, where start-ups are developing new and niche applications. Many of these are too small to attract significant PE interest at the moment; we will discuss this further in our next blog.

What's ahead?

So what do we expect in 2016? In summary, a continuation of the trends seen above; the sector is a great place to invest, international opportunities are only going to grow and, as the impact of funding challenges becomes clearer, pricing is likely to become more predictable.

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Delayed transfers of care
Who's to blame?

The answer is of course, no one individually. For too long however, the management of Delayed Transfer of Care (DTOC) or bed-blocking has been an organisational blame game, stifling the system response required.

The DTOC challenge has never been greater

The National Audit Office recently reported that in 2015, 1.15m acute hospital bed days were incurred for patients who had been declared medically fit for discharge.

So why is it happening?

Demand challenges, particularly with the frail elderly are well publicised, but different organisational factors are exacerbating the problem. Five years of year-on-year local government cuts are significantly impacting a discharge team's ability to provide a patient with rapid social care support when they are ready to go home. Similarly, we frequently see in our work shortages or fragmentation in intermediate care, meaning a patient has to remain in acute care for longer than required.

So only a system solution will do then?

Well yes, and no. If you were designing the NHS anew and creating a wellness organisation rather than an illness organisation, you would not create the current system. You would not have ward-based staff, discharge teams, social workers, community teams and access to beds in different organisations, budgets and decision making processes. To this end, the current model is flawed and a system solution should be driven through a new model of care and the Sustainability and Transformation Plan (STP).

Our recent work with Wolverhampton care economy however gives us confidence that short term benefits can be achieved whilst the longer system transformation bites. The pilot implementation across a mixture of Frail Elderly, Medical and Surgical wards achieved an average reduction of 15% in overall Length of Stay in a six week period. How? Not by changing the system, but through a relentless focus on operational excellence.

Another exciting example of operational innovation is through our work with all the West Yorkshire Association of Acute Trusts, the ABHI, and the Yorkshire and Humber Academic Health Sciences Network. In a ground breaking approach, the trusts are developing a dedicated hospital discharge company which will be jointly owned by them and a number of corporate partners. The service would immediately help to discharge patients by providing them and their carers with the technologies and support (e.g. sensor, remote monitoring, home care) necessary to maintain them safely at home. In order to fund the development, the group are exploring an option of taking a social investment bond, with a return on investment to be provided as the service generates a surplus.

In summary, DTOC is a system challenge and the blame-game needs to stop. A new model of care will drive significant benefits in the long term, but rapid improvements can also be made by relentless focus on operational excellence.

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Life Sciences in South East England attracting Japanese pharma investment

The Greater South East region is a powerhouse for the life sciences industry in the UK and part of that is being fuelled by the inward investment from Japanese Pharma companies.

'Working with MedCity', our report, Japanese pharma in Cambridge, London, Oxford, and South East of England, looks at why that is and offers some measures that could enhance the relationship.

Backed by significant UK Government effort, the region offers substantial attractions to Japanese companies looking to locate overseas, from the quality of its talent and academic institutions, to the robustness of its regulatory framework and the diversity of the pharmaceutical sector. Add to those an open and positive society, the availability of both specialist and general management talent, and competitive costs, and it's clear the region has a vast number of opportunities to offer.

Japanese pharmaceutical companies value the South East of England

Figure 4
How Japanese pharmaceutical companies rate the region

The shaded area and figure denote the mean rating out of 5. The minimum and maximum ratings are represented by the vertical lines.

Benefits for the patient

If Japanese pharma were to further invest in South East England (SEE) and partner with local organisations such as MedCity and the Catapults – more benefits could be realised by companies, SEE and consumers.

1. An expanded demand base could drive an increase in revenues for companies, particularly if there is no existing presence in SEE.
2. Through SEE's R&D facilities and network, the development of drugs could be accelerated benefiting consumers and companies. This ties in nicely with the objectives of the Office of Life Sciences which also commissioned our report on Accelerated Access.
3. Strengthening SEE's position as a key opinions leader could influence prescribing and treatment guidelines, taking into account innovative developments and improving the overall standard of care. This is critical if the UK is ever to regain the top spot for R&D and lead the way in terms of real world data collection.
4. Local technical, scientific and networking support from organisations such as MedCity and the Catapults could assist companies.
5. Increasing the network benefits of the already 150-plus biotech companies across the region, growing med tech and digital health technology capabilities.

How can investment be increased?

Working together across the SEE there are several actionable recommendations we identified:

1. Further **removal of red tape for clinical trials**, enabling early access and the uptake of innovation. The Health Research Authority (HRA) and the National Institute of Health Research (NIHR) are well placed to enact change here.
2. **Allow room for 'serendipitous' discoveries:** While most Pharma found finance accessible, UK academic institutions' research is driven by what is most commercially beneficial, with success measured via publications and grants received. Research councils and other funders could assist the government in encouraging research that focuses on earlier disease biology and more explorative research.
3. **Facilitate funding for start-ups:** The VC community is vibrant in SEE but some mid-sized pharmas struggled to access finance. The UK Government alongside R&D hubs could **incentivise investment** in this area, benefiting both VC's and companies in the medium to long term.
4. **Build business acumen:** UK academic institutions provide strong, deep research talent pools. Commercial nous of this talent is not as strong. Initiatives such as 'sandwich' placements, industrial internships and guest lecturers from industry would help strengthen this.

If these challenges are navigated and the opportunities are seized, SEE can offer Japanese companies a strong platform for growth outside Japan.

Read the full 'Working with MedCity' report on www.pwc.uk.com

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The value of patient data

We predict the connected health market will be worth almost US$61 billion globally by 2020, representing 33% average annual growth over this period. While this presents a huge opportunity to the sector, organisations have to give people sufficient confidence to share, and use, technology in an aspect of their life that is personal and sensitive.

Any concern from healthcare providers, patients and governments around data privacy could delay the growth of this market. This is particularly so in the UK, where we have already been restrained due to mistrust in health data security. So how can we get patients – and physicians – on board?

Patients can decide what their data is worth

Data sharing experts at Harvard say we can't guarantee anonymity of data, especially genetic data. For example, it would appear to be in the common interest to share data about rare diseases, but patients need to consent that they are happy for data to be shared not just about themselves, but also about their future offspring.

Rather than focusing on perceived issues of data security, the way to gain patients' trust is to weight the discussion towards the problems that digital can solve for the NHS – and, therefore, for them: The *NHS Five Year Forward View* is about designing new models for delivering care, mostly around integrating care across organisations. This is completely reliant on integrating care records which can be accessed by multidisciplinary teams – all of which will have huge benefits for patients.

The key to unlocking this lies in learning from the past. It used to be that individual organisations had their own strategies for reducing variability in patient outcomes and the quality of care people were getting. Now it is about whole regions – or 'health economies' – coming together to look at what they need to achieve for their population, and how to use digital to solve some of their problems and improve outcomes for patients.

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Links in Liverpool

Liverpool Clinical Commissioning Group (CCG) is one such provider making the most of digital technologies. Its More Independent programme links apps with patients' health records and clinical systems in a bid to get people better engaged with their own health.

This is a great initiative, but more needs to be done to get patients on board. While NHS England's *Patient Online programme* has enabled patients to access their full GP records, uptake has been slow. Many patients are still unaware of this usability, and GPs and patients remain concerned about data security.

Blockchain potential

Sharing of data will be key to embracing a fully digital health ecosystem. However a balance needs to be struck between data access, availability and integrity. Current technologies haven't allowed us to strike this balance, however a new technological innovation known as Blockchain finally will.

Blockchain technology consists of 'blocks' of data in a digital ledger, the way this data is stored and processed makes it highly resistant to malicious tampering enabling for the first time, immutable record keeping and audit trails. Blockchain provides other benefits such as removal of intermediaries, automatic reconciliation and greater automation. This has the potential to provide the security and access management behind health records, as well as reducing fraud, error and the cost of paper intensive processes.

In terms of healthcare data, this means you could upload your medical history and ID records onto a blockchain and choose which healthcare providers can access it. This would allow you to choose and change providers without the wait to transfer and validate medical records and insurance paperwork, or allow hospitals to create a tailored patient journey for you based on your conditions and booked appointments. The Blockchain can act as an immutable log that records an unchangeable history of who has accessed and edited your information. This enables greater transparency and oversight of your data and creates the trust environment for data sharing. Blockchain will help accelerate a move to a more patient centric health model. Estonia is already using Blockchains to secure electronic health records, and it is probable that other countries could leapfrog the UK when it comes to the take up of this technology, as they don't have the barrier of fragmented infrastructure that we have to overcome.

In fact, some clinical trials are already being managed using a blockchain, such as the Computerised Life Events Assessment Record project (CLEAR), led by Professor Antonia Bifulco, which is developing an interactive online method for measuring stress based on life changes, events and ongoing difficulties.

This exciting technology is proving a major disruptor across many industries. Although healthcare is a new player, it has the potential to give patients a sense of security around the safety of their data.

Read more about digital health at www.worldinbeta.com

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Health industries: Our people

Healthcare matters to us and it matters to our clients.

We all want better healthcare, sooner and the potential is there to make it happen. New technology, new breakthroughs, new ideas. But while there are opportunities, there are challenges too: constrained budgets, an ageing population and an increase in chronic conditions. At PwC we're working with clients to steer a course to success in this new health economy so we help improve healthcare for all.

We're working with the NHS, nationally and locally, as well as the private sector and the pharmaceutical and life sciences sector to deliver real, workable solutions to today's challenges. We're delivering transformation and integration projects with patient outcomes at their heart. And we're supporting organisations through testing financial times, often developing bespoke operational and digital systems. We give strategic support to organisations across healthcare and pride ourselves on convening different parts of the system to solve problems.

We also bring insight and expertise to healthcare as well as engaging in the public policy debate. For more information, subscribe to our Health Matters blog to receive regular insights at: *www.pwc.blogs.com/health_matters*.

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