The future of primary care: New models and digital requirements

Research report
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December 2015
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Primary care is changing. New approaches to care delivery and organisational design are emerging in response to a range of pressures, making the traditional model of general practice increasingly obsolete. Technology is playing a central role in enabling the development of new models. There is potential for organisations to make much greater use of existing technology. There is also scope for further technology innovation. But obstacles still stand in the way of primary care making greater use of existing technologies and developing new innovative solutions.

The Nuffield Trust was commissioned by NHS England in summer 2015 to undertake a review of the primary care landscape and to consider what emerging trends mean for the digital requirements of the sector (see Appendix 2 for more detail). This report sets out the findings of that review and considers the role that NHS England could play in driving the uptake and development of technology.
Key Points

- Primary care in England is changing rapidly.
- GP practices across the country have been spontaneously coming together into larger groups over the past five years with a wide variety of aims and forms. These changes are the result of GPs attempting to find solutions to rising demand, constrained resources and a shrinking workforce, but have also been shaped by the last coalition government’s policies which aim to increase integration, enable more care to be provided out of hospital and give primary care clinicians a central role in resource allocation.
- The policy environment is now unfolding rapidly once again, with more recent policies creating new multi-organisational models of care, many of them rooted in primary care, and accelerating seven-day access for patients.
- This research has identified a range of four key trends within the current landscape of rapidly scaling up primary care, which are facilitated by a further four supporting trends – all of which have powerful implications for the role of technology, to enable and sustain the evolution of a successful primary care sector in the future.
- The figures on the next page set out a snapshot of the main trends visible in primary care, with a summary of the technological enablers.
## Trends in primary care

### Key trends

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<td>- Changing and growing demand</td>
<td>Providing more preventative and proactive care for people on the registered patient list, and continuity with clinicians and teams to people who benefit from it most</td>
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<td>- Changing and growing demand</td>
<td>Extending access to patients requiring more appointment options (8am-8pm, 7/7)</td>
<td>- Telehealth/remote consultations</td>
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<td>- Changing patient expectations</td>
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<td>- Online signposting</td>
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<td>- Increased transparency about variation in quality of care</td>
<td>Using clinical decision-making tools and building relationships between primary and secondary care to change variation in referrals, prescriptions, diagnoses</td>
<td>- Clinical decision support systems</td>
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<td>- Professional-to-professional telehealth</td>
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### Trends in primary care (continued)

#### Facilitating trends

**Administrative efficiencies through scaled up organisations**

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**More diverse skill mix**

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<td>Skill mix within primary care teams is becoming more diverse</td>
<td>Patient portals, Online care navigation tools</td>
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**Improved education and training**

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<td>Increased transparency about variation in quality of care</td>
<td>Creating learning environments in out-of-hospital settings and sharing learning</td>
<td>Online knowledge sharing platforms (including social media), Video conferencing and Webex technologies, Mobile devices</td>
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**More patient empowerment**

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<td>Changing patient expectations</td>
<td>Increasing patient involvement in their own care</td>
<td>Patient portals, Remote monitoring, Wearables/ Apps, Online peer support</td>
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This research has identified a number of challenges for policy-makers looking to consider as they design a digital future for this crucial part of the NHS:

- Our analysis of the emerging landscape of scaled up primary care has revealed complexity in terms of form (with a large variety of legal and organisational structures), but also in terms of ambition, with some groups
more focused on improving access while others have prioritised the development of new out of hospital services.

- Policy-makers will need to prioritise the trends identified above— or at least ensure that they are aligned with wider policy developments, at the same time as ensuring that the autonomy and variety of scaled up primary organisations is respected: One size will not fit all.

- Policy-makers will also need to address the barriers and challenges that this research has identified as currently inhibiting both innovation and uptake of technology by primary care organisations. These include local or organisational challenges such as overcoming clinician and patient resistance to new technology, and gaps in information technology (IT) infrastructure, as well as more support from clinical commissioning groups (CCGs) to procure innovation and from provider organisations to protect time to adapt to new processes. These also include national challenges such as a lack of interoperability across the system, complicated information governance (IG) processes for providers, conflicting legislation, lack of control over clinical systems suppliers which should be working more collaboratively, and a lack of stable funding flows.

- NHS England should consider approaches on striking a careful balance between maintaining central control, quality and data governance and facilitating local autonomy and flexibility to develop systems that suit the local context.
1. Introduction

The English NHS is facing a number of significant challenges which require transformational change at a demanding scale and pace. Primary care is at the heart of this change, and digital technologies will play an important role in determining the success of new models of care.

The Nuffield Trust was commissioned by NHS England to provide a review of the primary care landscape, highlighting emerging developments and the likely implications for technology (see Appendix 2). This report forms one strand of a wider piece of work being undertaken by NHS England around the use of digital technology in primary care, all of which will feed into the development of a national digital operating framework.

Definition of primary care
For the purposes of this work, primary care services are considered to be traditional core GMS/PMS contracted services and out of hospital and community general care services which are managed by general practice or which have general practice at the heart of the service (NHS England, 2015a).

Methods
We reviewed academic and grey literature to identify the emerging trends in primary care, and associated technology enablers. We searched a range of databases and used our expertise and existing knowledge to identify the most relevant articles.

We then undertook six case studies to understand how the emerging primary care trends are changing service delivery in practice, and how technology is supporting this change. Potential case studies were identified via a combination of methods. Firstly, we categorised all recipients of Prime Minister’s Challenge Fund (PMCF) and Vanguard awards by the emerging trend they represent, the technology used and whether outcome data is available. We also reviewed innovative practice among members of the Nuffield Trust’s General Practice Learning Network and consulted with attendees of our first workshop and members of the NHS England team to identify further potential case studies. We then selected six sites which exemplify a spread of themes and technologies. The case studies are intended to highlight examples of innovative practice and how technology has enabled or driven change in service delivery or organisational development.

Finally, we held two stakeholder workshops. The first was with end-users of technology in primary care and technology suppliers to understand the challenges facing primary care in utilising technology in practice. The second was primarily with stakeholders from NHS England to explore what the Centre needs to consider in driving the digital agenda.

Structure of report
This report sets out the current policy context and the challenges facing primary care. It then explores the major trends emerging in primary care and associated technology
enablers identified through the literature. Next, case study examples illustrate how innovative models of care are being enabled by and, in some cases, driven by, new technologies. Finally, the paper reflects upon what these new trends mean for primary care; examines the obstacles and enablers to delivering future models; and considers the role of the Centre in supporting change.
2. Context

Drivers for change in primary care

Changing and growing demand

Although an estimated 90 per cent of NHS patient contacts occur in general practice, there is no record of how many public consultations take place in the sector. NHS England estimates, based on projections from 2008, that there was a 13 per cent rise in the number of consultations in general practice between 2008 and 2013 (see (HSCIC, 2009)). Despite a lack of precise data, demand is likely to have grown since 2008, particularly for people with multiple complex problems, due to a growing and increasingly ageing population (Dayan et al., 2014). Over 11.4 million people in the UK are aged 65 years or more, 40 per cent of whom have a limiting longstanding illness (Age UK, 2015).

The complexity of illness is changing the nature of primary care. The Department of Health estimates that by 2018 there will be 2.9 million people with three long-term conditions (from 1.8 million in 2012), and their health and care will require £5 billion additional expenditure (Department of Health, 2012). At the frontline, the rise in numbers of complex patients has meant that the number of test results dealt with by practices tripled between 2003 and 2013 (Primary Care Workforce Commission, 2015), and the percentage of people taking increasingly complex prescription regimes nearly doubled from 12 to 20 per cent between 1995 and 2010 (Guthrie et al., 2015).

Another driver of demand is the changing relationship between primary and secondary care. A recent report revealed problems in information sharing and communication processes across the sectors, as well as responsibilities for follow-up care increasingly being passed from specialists to general practitioners (GPs) (Clay and Stern, 2015). GPs also reported an increasing role in care navigation and the coordination of care along a pathway (Clay and Stern, 2015).

However, the formal transfer of services from secondary care to primary care through commissioning is a less clear driver. A 2010 Health Committee review found that very few secondary care services had been moved to the community (House of Commons Health Committee, 2010). Yet a recent report suggests that some practices have taken on services that other practices have considered to fall outside of their contracts, resulting in unequal distribution of responsibilities (Clay and Stern, 2015). Nevertheless, it is clear that the workload of GPs and other primary care professionals is rising, and the sector is having difficulty responding to demand and complexity.

Resource constraints

General practice is faced with a need for significant efficiency savings. Funding for primary care has seen a real terms decrease since 2009/10.

In 2012/13, primary care saw a 2 per cent decrease in its budget, compared with a 0.7 per cent rise in secondary care (Dayan et al., 2014). Spending on general practice
services then fell by a further 3.8 per cent in 2013/14 within the primary care budget. Individual GP incomes have also seen a real-terms fall (Dayan et al., 2014).

Investment in general practice premises has also been lacking. Five out of ten practices have not had investment or refurbishment in their premises in the last ten years, seven out of ten GPs report that their practice is too small to deliver extra or additional services, and four out of ten report their practices are not adequate to deliver services altogether (BMA - GP Committee, 2014).

**Changing patient expectations**

There is a growing desire among both the public and policy-makers for improved access to GP services. The annual GP Patient Survey has shown a gradual increase in the numbers of people in England reporting dissatisfaction with being able to get an appointment and ease of getting through on the phone between 2012/13 and 2014/15 (Ipsos MORI, 2015).

At the same time, there is a growing patient interest in the co-production of care plans, empowerment to manage their own health and access to their own medical data. In 2007, the Royal College of General Practitioners (RCGP) stated, “A doctor’s opinion is no longer regarded as sacrosanct and a new dialogue is developing between health care consumers and providers” (RCGP, 2007).

As such, general practice finds itself in a particularly difficult situation: under pressure to deliver immediate access to services for people with acute needs, while also delivering targeted care plans and encouraging engagement from people with complex needs.

**Increased transparency about variation in quality of care**

Unwarranted variation in quality of general practice services remains an issue in England. These variations can be seen in a range of measures including accurate and timely diagnosis, referral rates, levels of prescribing, access to services, continuity of care, and patient involvement (Goodwin et al., 2011). Although recent Care Quality Commission (CQC) reports suggest that 84 per cent of practices are good or outstanding, there remain over 15 per cent deemed to be providing a poor quality service (Millet, 2015). This suggests that there remain stubborn regional variations in quality and potential for improvement in some areas.

**Workforce shortages**

Although the total GP workforce increased by four per cent between 2006 and 2013, the number of GPs per 100,000 population fell (HSCIC, 2014). This compares with a 27 per cent increase in consultants in hospital and community services. The profession is reporting major problems with retention and recruitment: in 2013/14, 8 per cent of GP places and 12 per cent of GP training places remained unfilled (Primary Care Workforce Commission, 2015). In the 8th GP Worklife Survey, 35 per cent of GPs indicated that they were likely to leave direct patient care in the next five years; this figure rose to 61 per cent for GPs over the age of 50. These figures have increased since 2005 from 19.4 per cent and 41.2 per cent respectively. For those under 50, the most
frequent reason given for intention to leave was leaving to work abroad (Gibson et al., 2015).

The impact of the loss of trained staff is exacerbated by fewer trainees choosing general practice as their specialty. In 2013, only 40 per cent chose general practice, against a target of 50 per cent (GP Taskforce, 2014). Moreover, many of those who do choose general practice work on a sessional or part-time basis. This reflects a growing trend in the profession towards salaried working and away from the traditional model of independent contractor status. In 2013, GPs holding their own provider contracts accounted for 66 of the GP workforce, down from 79 per cent in 2006 (HSCIC, 2014).

Policy context
Alongside the challenges described above, a complex policy environment has been playing its part in shaping the primary care landscape.

Complex contractual landscape
GP contracts are seen to be inflexible and restrictive and currently inhibit the development of innovative models (Addicott and Ham, 2014). A survey of general practice undertaken by the Nuffield Trust and RCGP reveals a complex landscape of contractual arrangements that have been superimposed onto the three main GP contracts in order to enable collaborative working (Nuffield Trust, 2015). Furthermore, other contractual models – such as the prime provider and alliance models – have been developing in some localities in order to enable better integrated working across organisations (Addicott, 2014).

In recognition current contractual models standing in the way of change, NHS England has just announced plans to introduce a contract for large-scale extended primary care services. The contract will be voluntary and open to practices covering at least 30,000 patients. It is particularly intended to support new models incorporating primary care, community care and outpatient services (described below). This may help resolve some contractual complexity, although the level of uptake and subsequent impact remain unclear.

The creation of CCGs
The creation of CCGs in the 2012 Health and Social Care Act was the latest in a series of attempts to encourage a shift of hospital activity into primary and community care. A leading rationale for reform was that involving clinicians more directly in resource-allocation decisions would encourage them to decommission expensive secondary care services and recommission them outside hospital.

Although CCG impact on the balance of provision in primary and secondary care remains to be seen, the reforms have fundamentally altered the architecture of the NHS and, most notably, primary care. Under this new structure, GPs are not only providers of primary care but also commissioners of services for their populations, giving them greater powers over the flow of resources. With the advent of co-commissioning in 2014, these GP-led groups have been handed greater powers, which now extend to the commissioning of certain elements of primary care. By putting GPs at the centre of commissioning decisions in this way, many GPs have been drawn into leadership
positions that require substantial time. Research published in 2014 reported that a clinical chair of a CCG spends on average 24 hours per week on CCG and locality leads spend anywhere between 4 and 20 hours (Checkland et al., 2014), reducing the number of clinical hours they can work and potentially exacerbating the workforce challenge described above.

The creation of CCGs has also changed the way GPs are held to account and performance managed. Previously, their contract was held and managed by their local Primary Care Trust (PCT) but in 2012, this shifted to NHS England. However, although accountable contractually to NHS England, GPs also became responsible to their CCG for much of their clinical performance such as referral rates.

Co-commissioning seeks to clarify this complex arrangement by handing some contractual powers to CCGs (NHS England, 2014a). However, as CCGs are GP-led, there is potential for conflicts of interest to arise. Under procurement rules, CCGs are obliged to consider tendering for a broad range of services and the onus to demonstrate that GPs are the most appropriate provider if the contract is to be awarded to them. This has important implications for the provision of primary care, and particularly general practice, and raises questions about the extent to which CCGs should and could have a role in shaping provider organisations.

New models of care
The Five Year Forward View (FYFV) was published in 2014 and sets out a vision for the NHS, with primary care playing a central role in both the provision and coordination of care. The document describes a number of potential care models, the most significant for primary care being the Multi-specialty Community Provider (MCPs) and Primary care Acute Care Systems (PACS).
Multi-specialty Community Providers (MCPs)

MCPs aim to move specialist care out of hospitals and into the community for a registered population of 30,000 or more patients in close geographic boundaries. They would evolve out of community-based providers or general practices which would be joined together as networks or formal entities. As larger groups of practices, they would have potential to employ specialists and therapists or to bring them on as partners. These organisations could provide a majority of outpatient consultations and ambulatory care, and once sufficiently mature, could take over the running of community hospitals thus expanding their diagnostic and other services. At their most developed, they could take on a delegated budget for provision of services for their registered patients.

Primary and Acute Care Systems (PACS)

The PACS model describes a vertically integrated system which brings together GP, hospital, community and mental health services for a large population. They could either grow out of acute facilities which would own and run their own GP services or they could grow out of established MCPs which could evolve to take over and run local acute providers. At their most mature, this approach could develop into what is known as an Accountable Care Organisation (ACO) in some other countries and involve the single integrated organisation taking accountability for the entire health needs of a registered patient list under a delegated capitated budget.

Central to both models is a vision of general practice operating at a large scale, better connected with other services and providing a greater range of extended services than the traditional model. There is widespread consensus that in order to meet the challenges articulated above, there needs to be a shift away from the existing model of small, independent practices and towards new forms of organisations that enable practices to collaborate with each other and other providers (e.g. (Goodwin et al., 2011; RCGP, 2007; Smith et al., 2013)). It is clear from international experience that operating at scale can offer benefits in terms of economies of scale and in terms of better meeting the needs of patients who may need input from a range of professions (Smith et al., 2013).

Driving the technology agenda

The National Information Board (NIB) was established in order to set the strategy for the health and care system to comprehensively adopt information technology. In November 2014, the NIB published Personalised Health and Care 2020: A Framework for Action1 which aimed to support staff, patients and citizens to take advantage of the information revolution.

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Key features of the document include:

- Full patient access to medical records by 2018 (which has since been refined to 2016 and to include editorial access for patients);
- Creation of one easy-access channel for interacting with the health care system via nhs.uk;
- Development of an over-arching interoperability strategy encompassing common data standards;
- Establishment of a culture of openness and transparency – supported by publishing hospital metrics on myNHS; and
- Building public trust in IT primarily through on-going public dialogue, the appointment of a National Data Guardian (which has since taken place) and enhancing IG requirements.

The development of an interoperability strategy will be of fundamental importance to technology adoption and use in all sectors of the health care system.
3. Emerging trends in primary care

This section sets out the current features of policy and practice likely to influence the future of primary care. The challenges facing primary care (described in chapter 2) have driven the emergence of many of these trends, and have also acted as a catalyst for innovative thinking around how digital technology can better support general practice.

Within the context of scaled up general practice, larger organisations reveal a number of interrelated trends within them which will influence the future of primary care, including:

1. **Integration and extended service scope:** The changing and growing demand in patients with acute needs, and especially those with complex comorbidities require primary, community and secondary care services to work closely together. Local collaborations are arising that vertically and horizontally integrate services across provider settings to overcome fragmentation in the system and deliver person-centred care. Resource constraints are also driving the extended scope of general practice organisations, which move certain services and tasks out of secondary care and into cheaper primary care alternatives.

2. **More proactive care and continuity for complexity:** Driven by the changing nature of patient illness and patient expectations around relational continuity, there is an increased focus on proactive care of the registered patient list, as well as targeted services and relational and informational continuity of care for patients with complex needs.

3. **Increased access:** There is a strong policy focus on delivery of 24/7 care in both general practice and community settings, which is leading to new ways of triaging patients (e.g. via online portals or decision trees) and communicating with patients (e.g. via e-mail, video, telephone or web platforms).

4. **More consistent clinical decision-making:** The transparency from reporting quality outcomes has highlighted long-standing variation in general practice. Decision-support tools are therefore increasingly important in decreasing variation in quality of care, as is establishing relationships between primary care and hospital specialists and ensuring GPs have improved access to specialist opinion.

The first four influential trends are facilitated by four further trends, including:

5. **Administrative efficiencies through scaled up organisations:** Nearly all of the drivers for change in primary care suggest the need to operate at scale. Scale is needed to deliver the care required for a population that is ageing and with a growing burden of multi-morbidity within a highly resource constrained environment. It also strengthens the capacity to develop the workforce and improve the quality of care delivered.

6. **More diverse skill mix:** Driven by decreased numbers of GPs and increasing complexity of patients, the skill mix within the primary care team is becoming more diverse including extended roles for nurses and support staff; input from a
range of allied health professionals; physician associates; as well as more
dedicated sessional input from consultants.

7. **Improved education and training:** Driven by a desire to decrease variation in
quality, and more generally improve the standard of care, there is an increased
focus on sharing intelligence and skills across sites and between professions.

8. **More patient empowerment:** The rising demand for care and patient
preference for involvement in their care, has led to patients increasingly taking
greater roles in decision-making and self-management.

The following sub-sections set out the key aspects of each trend alongside existing key
technology which may support new ways of working. We highlight the *key*
driver/challenge behind each trend, although in reality the trends may have several
drivers. We also match each new technology to a particular trend; however in rare cases
they have been repeated across trends due to their pervasive nature (e.g. shared
electronic health records).

### Integration and extended service scope

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**Key drivers of the trend**

Demographic changes in the UK have made the prevalence of morbidity and co-
morbidity “the rule rather than the exception” (RCGP, 2007), which has driven the
need for integrated care. Integrated care models support independence of
people with complex needs, improve patient experience and satisfaction, and in some
cases, can reduce the use of acute and emergency care (Humphries and Wenzel, 2015)
and provide high-quality services at lower costs (Curry and Ham, 2010a; Ham and
Walsh, 2013).

There are also widespread assumptions among policy-makers that increasing scope of
services can create efficiencies in local health economies, and diversify funding streams
for primary care providers. However, at present there is little evidence to support these
assumptions.

**Implications for primary care**

The Five Year Forward View places an emphasis on at-scale integrated organisations
which bring together a number of care providers (potentially under one contract and a
capitated budget) to provide population care to a registered patient list, with a key aim
being to shift care out of hospital. In these new integrated models, namely the MCP, the
GP holds responsibility for managing and coordinating care, while mobile health and
social care teams will work collaboratively to provide care in general practice, community, homes and care homes.

Some of the anticipated impacts of moving care out of hospital are that services will be shaped around patient pathways (ideally with a balance between prevention, early identification, assessment and long-term support), and emphasis will be on ensuring patients stay out of hospital by offering outpatient care (e.g. diagnostic procedures) and managing minor complications. This will mean that an increasingly important part of GPs’ roles will be integrating and coordinating care for patients with multi-morbidities (Mathers et al., 2012). The intensified coordination role for GPs is likely to increase their administrative burdens – caused by increased requests to undertake tests, provide onward referrals to other generalists and specialists, etc. It may be possible to delegate some of these tasks to administrative staff or cheaper clinical staff, which would allow GPs to spend longer with patients who require more intensive care, but this presents problems for smaller practices. See ‘More diverse skill mix’ below for further discussion.

The rise in integrated out-of-hospital pathways will also mean that primary care based generalists and hospital based specialists will work together in new ways as part of multi-professional teams and clinical networks (Mathers et al., 2012). Sessional hiring of consultants is already emerging in some at-scale general practice organisations, although resistance from secondary care colleagues to leave hospitals is hindering organisations enhancing their scope and integration of services (Nuffield Trust, 2016). Co-location of generalists and specialists may be desirable, but only in situations where specialists are not isolated from secondary care colleagues and where shared learning occurs (e.g. where consultants support primary care staff to work in extended roles (Robertson et al., 2014). Role differentiation will also be important, as will organisational incentives that allow specialists to work flexibly across sites (to reduce duplication and waste) (Goodwin et al., 2011). Overall, the integration of clinical teams and services will be far more important than the integration of organisations (Curry and Ham, 2010b), and clarity of and commitment to team objectives will be extremely influential in terms of effectiveness of teams (Poulton and West, 1999). Therefore leadership will be required to develop shared goals in newly integrated teams – the process to do this may also require significant management support and engagement with team members.

As described in Chapter 2, integration via the FYFV models will require changes to commissioning. As NHS England shifts providers to the ACO model, we may see integrated commissioning across health and social care (Humphries and Wenzel, 2015) and new varied types of contracts (e.g. MCP or PACS contracts, alliance contracts) (Addicott and Ham, 2014; NHS England, 2015b). One of the expected challenges for commissioners in local areas in which MCPs and PACSs operate, will be GPs’ resistance to relinquishing their independent contractor status; 80 per cent of respondents to a recent BMA survey did not support moving away from the status quo (BMA, 2015). The lack of support may stall the formation of organisations.

Technology enablers

Shared data, electronic health records and timely and consistent electronic discharge letters will be fundamental in enabling dispersed teams of health care professionals to work together across geographic and sector boundaries (Clay and Stern, 2015). Currently GPs and community nurses frequently have different sets of notes, and out-
of-hours services often have no notes at all, which results in inefficiencies and risks to patient care (Mathers et al., 2012). Shared electronic patient records may play a role in ensuring informational continuity – therefore, improving patient handovers, the ordering of services and joined-up patient care. They have the potential to transform the way mobile community teams work, through real-time access to patients’ histories and medication schedules as and when they are needed. Of course for this to work effectively, sound interoperability and information governance solutions are needed, as well as leadership and management mechanisms to maintain a cohesive team when regular attendance at a common physical base has been removed. It will be important to be realistic about costs and expectations. Many existing electronic patient record systems will need to be modified to ensure inter-operability which will involve significant costs, and may not improve continuity with many secondary care, as many hospitals continue to rely on paper based systems to record patient information (Mathers et al., 2012).

Professional-to-professional telehealth in the form of real-time phone, video or web consultations is also likely to improve integration across diverse teams and lead to more effective, joined-up care. At present communication between professionals within hours, not days, would be an improvement (Clay and Stern, 2015). Telehealth communication between professionals may be particularly important for at-scale models such as PACSs or MCPs. It will enable GPs to seek specialist opinion during or shortly following a patient consultation – allowing a patient to benefit from a specialist consultation while maintaining an on-going relationship with the GP. Similarly, store and forward technologies such as e-mail will enable GPs to send test results or images to specialists, receiving specialist input on a case while maintaining on-going management. If professional-to-professional telehealth is to take off on a large scale, investment in infrastructure will be required as well as buy-in from a range of health care professionals and designated time in their schedules to offer remote support. In addition, it will be important to consider how payment for services is handled.

Technology can be used to support GPs in expanding the range of services they offer. Point of care testing is becoming cheaper and more widespread, enabling GPs to undertake tests on site that historically would have required a hospital laboratory.

Moreover, as GPs move to delivering more psychological interventions, online modules such as Computerised Cognitive Behavioural Therapy may reduce the need for direct GP input.

### More proactive care and continuity for complexity

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<tr>
<th>Key driver</th>
<th>Trend</th>
<th>Enabling Technology</th>
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<tbody>
<tr>
<td>- Changing and growing demand</td>
<td>Providing more preventative and proactive care for people on the registered patient list, and continuity with clinicians and teams to people who benefit from it most</td>
<td>- Electronic health records</td>
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<tr>
<td></td>
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<td>- Remote monitoring devices</td>
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<td>- Patient data and screening</td>
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</table>
Key drivers of the trend
People living with multiple long-term conditions often experience high rates of unplanned admission to hospital. Such admissions are distressing for patients and costly to the NHS (Lewis et al., 2011). The ageing population has driven a focus on finding new methods to manage complexity in the community, namely using proactive case management and care planning.

Implications for primary care
A range of interventions have been used to manage complexity, for example, the introduction of care coordinators, self-management support and patient education, peer support, care coordination and management, enhanced multi-disciplinary teams (e.g. inclusion of pharmacist or social worker), as well as individual care plans, structured visits and contacts (Smith et al., 2012).

As a result of recent national investment in proactive care for patients most at risk for unplanned admissions to hospitals (see: NHS England, 2014b), there has been an increased emphasis on the use of predictive risk tools and care planning (see for example, the South Somerset Symphony Programme and VitruCare case studies).

There is evidence of an association between care planning and decreased hospital admissions (see (Boult and Wieland, 2010; Chiu and Newcomer, 2007). Additional anticipated benefits with care planning include improved self-management, increases in patient-centredness, and reductions in unnecessary care utilisation (Burt et al., 2012). The RCGP suggests that a designated care co-ordinator with sufficient authority to influence across a range of different health and care providers is essential to the care planning process. There is scope for both GPs and advanced nurse practitioners to undertake this role, potentially in collaboration with care navigators. Focusing care planning efforts on patients best placed to benefit is essential, and predictive risk tools are increasingly being used to target patients for care planning interventions.

Relational continuity is also effective in managing complexity and has been associated with more satisfied patients and clinicians, reduced costs and better health outcomes, lower hospital utilisation, and among older people, lower mortality (Freeman and Hughes, 2010; Nutting et al., 2003; Saultz and Lochner, 2005; Wolinsky et al., 2010).

The provision of continuous care and trends of increasing scale and access need to be balanced: new models are emerging which aim to work with the potential challenges of bigger more dispersed teams. For example, one model suggests placing GPs into micro teams, which are groups of two or more doctors who work together to provide continuity of care to an allocated number of patients (Ware and Mawby, 2015).

Increasing the length of consultation is also seen as a way to ensure better continuity for patients, and the current 10-minute consultation was viewed as insufficient by over 90% of recently surveyed GPs (BMA, 2015). Yet longer appointments are reliant on practices screening out self-limiting conditions, encouraging patients to self-manage and dealing efficiently with acute needs – technology has the potential to be have an extremely influential knock-on effect on continuity.
Technology enablers
Data generated through shared electronic health records and monitoring devices will be essential in moving to a model of proactive and population care. Patient data can be used to identify those at risk, enabling proactive group screening and early intervention. Similarly, on-going remote monitoring (of diabetes patients for example) can identify early signs of deterioration and enable proactive and preventative care.

On-going analysis of data in electronic health records and the use of predictive analytics relies heavily on investment in personnel who are able to hold and process complex data sets (e.g. data analysts). It will be important to consider how provision is made for GP organisations to ensure the infrastructure is in place to make the most of data in the system.

Increased access

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<th>Key drivers</th>
<th>Trend</th>
<th>Enabling Technology</th>
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<tbody>
<tr>
<td>- Changing and growing demand&lt;br&gt;- Changing patient expectations</td>
<td>Extending access to patients requiring more appointment options (8am-8pm, 7 days per week)</td>
<td>- Telehealth/ remote consultations&lt;br&gt;- Remote monitoring&lt;br&gt;- Online signposting</td>
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Key drivers of the trend
There is an established association between timely access to general practice and the number of patient self-referred visits to accident and emergency (A&E) departments (Agarwal et al., 2012; Cowling et al., 2013). In 2012/13 over five million A&E attendances (about 25 per cent of all attendances) were preceded by a patient not being able to obtain a general practice appointment (or a convenient appointment) – this figure has been rising in recent years, and many patients could have been managed by a GP or emergency nurse practitioner (Amiel et al., 2014; Cowling et al., 2014). For this reason, the government has promised that all patients will have access to seven day services by 2020 (Prime Minister’s Office et al., 2015). The seven-day access policy has been introduced in parallel to other access initiatives encouraging GPs to provide care from 8am-8pm through extended hours contracts.

Implications for primary care
A range of approaches will be needed to deliver more accessible GP services.

Firstly, general practices will need to work collaboratively to take advantage of organisation-wide capacity during core and extended hours, as well as share patient records with out-of-hours providers to deliver a truly ‘seven day service’. Some GPs support the move to improved patient access; however more widely there is low support for seven day working (BMA, 2015; Easton and Baker, 2015). The lack of support stems in part from practices reporting difficulty recruiting staff to work extended hours and a lack of sufficient patient demand to justify weekend opening (Ware and Mawby, 2015). Even leading at-scale general practice organisations, such as Modality Partnership, suggest that weekend opening hours are not justifiable. Modality piloted a weekend hub in early 2015 which was available to approximately 45,000 patients from five of Modality’s largest practices. Low patient demand led to an early end to the Modality pilot, but encouraged the organisation to focus on providing
remote consultations and more online services potentially on a 24/7 basis once the numbers of registered patients has grown and sufficiently increased demand. (see the Modality Partnership case study). The recent Wave 1 Prime Minister’s Challenge Fund (PMCF) evaluation also revealed that Sunday (all day) and Saturday afternoon appointments were not used efficiently, and recommended extended weekday hours, and urgent care rather than pre-bookable appointments Saturday mornings (Mott MacDonald, 2015).

Other increasingly popular methods of improving patient access include:

- Extending hours to general practice services (including services with other health professionals, e.g. pharmacists, paramedics, physiotherapists, etc.);
- Allowing patients to undertake practice registration, appointment booking, and request e-prescriptions online;
- Providing online self-care advice for computer literate patients;
- Co-locating GP services with other parts of the system (e.g. hospital emergency departments), which can be particularly helpful during out of normal opening hours; and
- Providing home visits and outreach services for care homes and special populations (e.g. homeless people) through better collaboration between general practice and district nursing (facilitated through remote access to patient records)(Mott MacDonald, 2015; Ware and Mawby, 2015).

**Technology enablers**

New modes of interaction are going to be essential in extending access. Patient-to-professional telehealth through telephone, video, e-mail or web-based consultations offer opportunities for GPs to see more patients quickly – given the time remote consultations take is often less than a face-to-face visit (Caffery and Smith, 2010). Two examples of online tools which are increasing in popularity are webGP and askmyGP, both of which allow for patient triage, remote consultations, and online self-management advice. Despite similarities, they differ across a range of implementation aspects. For example, webGP aims to divert patients from consulting a GP by encouraging patients to complete an online form to describe their illness, while askmyGP uses a trained receptionist to record information and direct the patient to either a same-day remote appointment with an aim for a clinician to reply to the patient within the hour (askmyGP, 2015).

The evidence supports further frontline piloting of the use of technology to improve patient access. Patients with access to online services through their GP practice were more likely to have rated their GP practice as ‘very good’ than those who did not have online access, which suggests investment in IT might improve patient experience (Ipsos MORI, 2015). Remote appointments have also been linked with decreased need for extended and weekend hours, as well as reduced numbers of A&E visits (Longman, 2012); however, there is mixed evidence to suggest that reducing barriers between patients and health care professionals through e-mail or web-messaging can increase demand (Atherton, 2013; Greenhalgh et al., 2010; Zhou et al., 2014). In the absence of clear evidence, many doctors report feeling fearful that tech-enabled consulting will increase workload (BMA, 2015) or create risks that do not exist when consulting face-to-face.
Opportunities for self-management and remote monitoring (see Patient empowerment below) as well as a move to proactive care (see More proactive care and continuity for complexity above) are also likely to change the way the patient interacts with the health care system. This in itself will impact on access requirements and patients are likely to feel more connected to the system on an on-going basis. In addition, clear signposting to other services through comprehensive online service directories may improve access to support, while potentially reducing demands on GP time (see More diverse skill mix below).

More consistent clinical decision-making

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<th>Key driver</th>
<th>Trend</th>
<th>Enabling Technology</th>
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| - Increased transparency about variation in quality of care | Using clinical decision-making tools and building relationships between primary and secondary care to change variation in referrals, prescriptions, diagnoses. | - Clinical decision support systems  
- Professional-to-professional telehealth |

Key drivers of the trend

There is considerable variation (not explained by differences in population needs) in the quality of diagnosis, prescribing behaviours, methods of management of acute illness and referral rates within and between general practices. The variation means that some treatments are clinically inappropriate and costly (Foot et al., 2010; Goodwin et al., 2011).

Implications for primary care

Methods to decrease unwarranted variation in quality have been discussed extensively in the literature. For example, improvement of the quality of referrals should focus on timely referrals, the quality of referral letters, and involving patients in decisions about referral options. To do this, teams should undertake local audits, examine patient reported data, develop clear referral criteria and evidence-based guidelines, facilitate peer-review, and welcome feedback—these are likely to be both cost and clinically effective (Blank et al., 2015; Goodwin et al., 2011; Imison and Naylor, 2010; Saklatvala, 2015). Moreover, prescribing variation could be decreased by reducing medication errors, improving medication adherence, and standardising prescription behavior (e.g. use of low cost statins) (Goodwin et al., 2011). Breaking down the barriers and improving communication between specialists and primary care could be particularly important in improving referral processes.

Technology enablers

Computerised Clinical Decision Support Systems (CDSS) will offer valuable opportunities to standardise clinical decision-making. CDSS are electronic systems, usually embedded within EHRs, which provide clinicians with computer-generated knowledge to aid with diagnostic and treatment decisions. In their simplest form they offer suggestions based on clinical guidelines and symptoms entered by a health care professional. However, more sophisticated systems can draw on large patient datasets
and the patients’ history to suggest courses of action along the patient pathway. There is strong evidence that decision support systems improve practitioner performance (Garg et al., 2005; Jaspers et al., 2011; Kawamoto et al., 2005).

CDSS may become more sophisticated in the future. As activity-based EHRs develop, it is likely we will see advice from decision support systems embedded in work protocols within an EHR - advising health care professionals to order particular tests until a diagnosis is reached, then generating treatment recommendations. The technology exists to enable the link up of these activities across sectors and providers allowing both a GP and a hospital consultant to track and respond to actions across the care pathway. At present, this type of approach is used in advanced health care systems in the United States such as Intermountain.

Technology will aid in removing barriers between specialists and primary care professionals. Professional-to-professional telehealth through telephone, video and web-based consultations is likely to play a key role in this (see Integration and extended scope services above).

Administrative efficiencies through scaled up organisations

<table>
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<tr>
<th>Key drivers</th>
<th>Trend</th>
<th>Enabling Technology</th>
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<tbody>
<tr>
<td>- Changing and growing demand</td>
<td>Collaborative working between general practices</td>
<td>- Shared human resource, finance and performance management systems and e-rostering</td>
</tr>
<tr>
<td>- Resource constraints</td>
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<td>- Contact centres and online booking systems</td>
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<tr>
<td>- Changing patient expectations</td>
<td></td>
<td></td>
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<tr>
<td>- Increased transparency about variation in quality of care</td>
<td></td>
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<td>- Workforce shortages</td>
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Key drivers of the trend

Working at a large scale is not a new trend. In the 1990s, at-scale GP fund-holding organisations pooled registered patient lists (to sizes around 100,000 people) to diversify risk in their budgets (Martin et al., 1997; Smith, 1999). This development of large primary care provider organisations has continued into the 21st century both in the UK and abroad (Smith et al., 2013). However, more recently, a national survey of over 700 GPs suggested that some GPs appear to be collaborating with each other for a range of reasons, such as:

- To achieve efficiencies through merging back office functions (e.g. IT systems or HR) and offer extended services to patients that have typically been provided outside of primary care (to meet changing and growing demand and manage resource constraints);
- To improve clinical outcomes and improve the opportunities for collaborative learning and peer review (driven by transparency of variation in quality);
- To pool human and financial resources to overcome workforce shortages; and
To allow more flexible opening hours to meet changing patient expectations (Nuffield Trust, 2015).

The survey findings echo the literature on motivations to scale (see for example, (Goodwin et al., 2011; Imison et al., 2010; Smith et al., 2013).

Implications for primary care
Since 2014, general practice at scale has become an explicit policy focus with other ‘at-scale integrated’ organisations being encouraged in the FYFV (see 1.2 for more).

The implications of the emergence of these new models on the primary care landscape are profound. One of the key findings from the Nuffield Trust-RCGP survey is that the primary care landscape is changing rapidly. About 45 per cent of GPs surveyed reported being part of an at-scale organisation that had existed for 12 months or less. Most respondents reported being part of a ‘federation’ model and operating as a private limited company in one locality or CCG (Nuffield Trust, 2015).

Another key finding from the survey is that it is challenging to develop back-office efficiency in the early stages of an organisation. The top motivation for respondents in joining an at-scale organisation was identified as the ability to achieve back-office efficiency through back office mergers, yet respondents who were members of at-scale organisations reported prioritising a range of other actions before setting up a shared back office (such as, extending the range of services available, investing in staff training, aligning clinical pathways, developing an organisational strategy, etc.). This suggests that a certain level of organisational maturity (and possibly size) is required before they can realise on back office efficiencies. Looking to the future, as organisations mature, there will be a strong demand for technology which will enable sharing of back-office functions.

Technology enablers
As practices increasingly become part of a network or partnership, technology can be employed to realise efficiencies afforded through operating at scale. Shared HR, finance and performance management systems across a large number of practices may reduce licensing and operating costs. In addition, e-rostering technology can enable effective task management, allocation, and hand-overs, all of which may be particularly useful when working across provider sites or with mobile community teams (NHS Employers, 2007).

Contact centres and online booking systems are likely to play an important part in effectively managing demand across scaled-up organisations, and allowing patients to access alternative locations within the network for more timely care.

More diverse skill mix

<table>
<thead>
<tr>
<th>Key drivers</th>
<th>Trend</th>
<th>Enabling Technology</th>
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<tbody>
<tr>
<td>Changing and growing demand</td>
<td>Skill mix within primary care teams is becoming more diverse</td>
<td>- Patient portals</td>
</tr>
<tr>
<td>Workforce shortages</td>
<td></td>
<td>- Online care navigation tools</td>
</tr>
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</table>
The future of primary care: New models and digital requirements

Key drivers of the trend
In order to meet rising patient demand and complexity, a broader range of clinical, administrative and managerial skills are needed. From 2010 to 2013 the number of GPs per 100,000 population in England fell from 60.5 to 60 (Dayan et al., 2014). In addition, around two-thirds of practice nurses are aged 50 or more and nearing retirement and the number of community nurses fell by nearly 40 per cent between 2001 and 2011. The pharmacist workforce appears to be the only primary care profession with an adequate supply of graduates (Primary Care Workforce Commission, 2015).

Implications for primary care
The skill mix within the primary care team is becoming more diverse including extended roles for nurses and support staff; input from a range of allied health professionals; physicians associates; as well as more dedicated sessional input from consultants (Primary Care Workforce Commission, 2015). The broader skill mix is better able to meet patient need and provides some solutions to the anticipated workforce shortages.

One example of a supplementary role is a medical assistant—a staff member who can review test results, arrange follow-up appointments, return patient calls, etc. A recent pilot of the introduction of a UK-based medical assistant-equivalent role in around 10 practices revealed a 30 per cent reduction in GPs’ administrative workload (Serjeant, 2015). It is expected that there will be a wider roll out of medical assistants among practices that prioritise decreasing GP workload, and have the capacity to offer the three-week training course.

Where introducing new roles and creating team-based models researchers suggest creating clear definitions of each team member’s role, and boundaries and understanding interactions among team members (Freund et al., 2015; Imison et al., 2008; McPherson et al., 2006). Evidence from the Wave 1 PMCF pilots also reveals that collaboration between new teams has been most effective where individuals already had established working relationships, engagement about change was discussed early, and there was buy-in from GPs and provider partners to a shared vision (Mott MacDonald, 2015). There are also a number of ways in which to employ professionals: on a sessional basis at one site, as a full or part time salaried staff member within a GP organisation spanning multiple member practices. Decisions should be made based on careful analysis of needs.

Technology enablers
As primary care teams expand and a wider range of services are offered, technology can be used to help patients and professionals navigate the system. Online decision trees which ask a range of questions to determine the most appropriate service can be used by both health care professionals and patients (see West Wakefield case study). In addition comprehensive patient portals and directories which enable patients to self-triage based on guides to services available locally will help to make better use of multi-disciplinary teams and manage GP demand. Demand management tools are likely to be particularly important given that supporting patients navigate the health care system is currently adding to the GP workload (Clay and Stern, 2015). webGP and similar online tools also decrease uncertainty about daily patient mix and can help members of clinical
teams prepare in advance for individual consultations, making often very time-constrained appointments more efficient.

The technology enablers for integration and standardised clinical decision-making are also likely to be relevant to multi-disciplinary primary care teams, as are the enablers for training and education, which will be necessary to underpin the roll out of new roles.

### Improved education and training

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<th>Key driver</th>
<th>Trend</th>
<th>Enabling Technology</th>
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| Increased transparency about variation in quality of care | Creating learning environments in out-of-hospital settings and sharing learning | - Online knowledge sharing platforms (including social media)  
- Video conferencing and Webex technologies  
- Mobile devices |

### Key drivers of the trend

In order to expand the skill mix as described above and to deliver better care in new models that address rising demand and variation in appropriate ways, all staff will require an increasing range of skills. With some exceptions (for example, medical student teaching and GP training), little priority has been given in the NHS to training and professional development for staff working in primary care (Primary Care Workforce Commission, 2015).

### Implications for primary care

The Primary Care Workforce Commission emphasised the need for a range of tools to enable education including: protected time for education, skills in evaluation to enable people to reflect critically, and time to undertake quality improvement. Support was also needed for innovations to spread, it seemed that too often, innovative practice was confined to the innovator’s immediate circle (Primary Care Workforce Commission, 2015).

Training and CPD can be difficult to organise for an individual practice or pharmacy, and there is wide variation in the access and time given to staff training. The Primary Care Workforce Commission therefore expects at-scale general practice organisations and Community Education Provider Networks (CEPNs) to be best placed to develop and deliver training and education at scale. CEPNs have particular aims to promote learning based around the integrated health and care needs of populations, as well as bring together health care providers, community organisations and local authorities to provide education that is much broader than what is traditionally provided to single professional groups (see for example, Health Education South London). In the implementation of the CEPN model, there is strong evidence that a variety of training methods be used, including shared learning [one trainer and multiple trainees in the same practice], 1:1 learning, and online webinar learning (Ahern et al., 2013; Barnett et al., 2013, 2012). Training opportunities should be extended to all primary care staff wishing to develop extended clinical, academic or leadership roles during their careers. To note, there is a particular need for leadership training and on-going support for
primary care staff with leadership roles in federations and networks (Primary Care Workforce Commission, 2015).

**Technology enablers**

Digital and online technologies can facilitate greater knowledge sharing. Webex and video conferencing technology enable GPs to take part in group learning from remote locations (see AT Medics case study). Similarly, social media is facilitating informal knowledge sharing among professionals and the establishment of virtual communities of practice.

Mobile devices and technology at large are already being used for supporting and facilitating professional education and training by allowing rapid access to information (e.g. on medical conditions, on medication doses); easier access to resources (e.g. textbooks, lectures, medical journals, apps); quicker, more effective communication with colleagues and teachers; exchange of clinical data or images relating to patients; and for planning and preparing studying (e.g. keeping a record of clinical experiences).

In secondary care settings, simulation learning through the use of programmable manikins has been useful, although it is not clear that this kind of training is appropriate in primary care.

**More patient empowerment**

**Key drivers**
- Changing patient expectations
- Resource constraints

**Trend**
Increasing patient involvement in their own care

**Enabling Technology**
- Patient portals
- Remote monitoring
- Wearables/ Apps
- Online peer support

**Key drivers of the trend**

Since the late 1980s GPs in England have been advised to take an approach to care that consciously adopts a patient’s perspective (see for example, (Levenstein et al., 1986)). Increasingly, patients desire greater involvement in their care (Coulter and Jenkinson, 2005), and there is a move towards engaging patients along the entire pathway, starting with prevention. There is also an assumption that engaging patients in their care will save money and reduce demand, although there is mixed evidence to support this (Purdey and Huntley, 2012).

**Implications for primary care**

Patients are increasingly being offered opportunities to be involved in their health and care. Foot (2014) recently outlined eight priority areas in which patients stand to benefit from involvement in their care (Foot, 2014), three of which include:

- **Shared decision-making** can improve adherence to treatment and medication (Nunes et al., 2009) and improve knowledge when decision coaching is offered (Stacey et al., 2013). When accompanied by a decision aid patients choose tests which are often deemed unnecessary less often ((Stacey et al., 2011));
- **Patient self-management** which can improve patient knowledge, understanding, confidence, and coping – and overall self-management programmes are most effective when they are disease specific (National Voices, 2014);
- **Personal health and/or social care budgets**, which have been associated with improvements in people’s self-determination (Glendinning et al., 2008).

Furthermore, self-referral in some specialties, such as direct access to physiotherapy, has proven to be cost-effective and to have outcomes similar to GP consultations (Mallett et al., 2014). Most patients with access to an online record report a positive experience, which suggests that patient portals have the potential to promote and reinforce collaborative relationships between patients and clinicians (Bhavnani et al., 2010). Overall self-management is increasingly viewed as benefiting patients, and potentially enabling professionals to meet patient demand although as noted above, there is mixed evidence to support this.

**Technology enablers**

Comprehensive patient portals or online services which give patients access to their records (e.g. OpenNotes); information and advice for self-management; and opportunities to either book GP appointments online or self-triage to other services, are likely to play a fundamental role in empowering patients, and improving quality process and outcome measures, for example, improving medication adherence (Wright et al., 2015).

Remote monitoring devices which enable patients to monitor their own signs such as blood sugar levels are also likely to play a large role in self-care. Patients can be empowered to adjust their medication dose based on the readings, or send the readings directly to a health care professional who makes a decision on the required course of action.

Wearable devices such as Fitbits and smartphone apps are also starting to enable patients to manage their health and wellbeing. A vast number of apps are available to the consumer which range from support for smoking cessation, exercise and healthy eating to tools, resources and advice to manage long-term conditions.

The policy context is likely to shape the use and impact of wearables and apps. Read/write access to patient records which is scheduled for 2016 in the UK will mean data from these devices can be transferred directly to health records – potentially aiding monitoring and clinical decision-making. However, there are concerns about the sheer volume of data these devices may create and the capacity of GPs and other health care professionals to meaningfully interpret and store it. Moreover, it is unclear how reliable or clean the data will be and how much faith should be placed in it by the health care community. Plans to Kitemark apps may alleviate concerns about data reliability, but they raise others about accountability. These issues are fundamental to technology use in this context and must be considered before official policy or legislation change.

Finally, the growth of online peer support services such as ParkinsonNet in the Netherlands (http://www.parkinsonnet.info/), which offer resources, advice and support for those living with illness, have the potential to enable patients to care for themselves more effectively.
4. **The future today: findings from six case studies**

We undertook six case studies to understand how these trends are playing out in practice, and how technology is being employed to support new models of service delivery. We aimed to explore a range of primary care trends and supporting technology use across the cases. Table 1 below sets out the trend explored in each case.

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<td>West Wakefield</td>
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<tr>
<td>VitruCare</td>
<td>Patient empowerment &amp; co-creation of health care</td>
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<tr>
<td>South Somerset</td>
<td>Integration and co-ordination of care</td>
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<td>Symphony</td>
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Here we set out a summary of each case study. Each summary focuses on the trend associated with the case study, even though the site may be doing more with technology or innovative service delivery. The case studies draw on interviews with organisational leaders and additional material supplied by the organisations to the project team.

**Modality (formerly Vitality)**

Modality is a super-partnership with responsibility for 75,000 patients registered with 15 practices across Birmingham and Sandwell. It was known as Vitality Partnership until September 2015. Since its origins in 2009, Modality has aimed to deliver general practice, specialist and community services 24/7 in an integrated way, similar to the integrated care organisation model in the US.

Its current technology offer is available to the 46,000 patients registered at its five largest practices. At the heart of the technology offer is a remote hub that triages patients to online self-care videos or a same-day contact with a clinician via telephone, Skype or a face-to-face appointment at a later time.

The hub has been successful since its initiation in September 2014, receiving over 700 calls per day. 65 per cent of health concerns are dealt with remotely, consultation times have dropped to five minutes, and despite an overall 10 per cent increase in same-day activity there has been a 72 per cent reduction in did not attends (DNAs). Lastly, 70 per cent of patients say that the new access system is better than before.
PMCF Wave 1 funding has supported the creation of the hub, but has fallen short of funding the development of an online care planning tool for people with chronic conditions, which Modality would like to develop in the future. Modality’s recently acquired Vanguard funding will be used to realise its vision for online access.

At a glance

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<tr>
<th>Technology employed to improve access</th>
<th>Telephone and video consultations</th>
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<tr>
<td></td>
<td>Resources for self-care</td>
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<td>Online triage</td>
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<tr>
<th>Enablers</th>
<th>Clear vision – IT was needed to meet demand</th>
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<td></td>
<td>Collaboration with like-minded local tech firm</td>
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<td>National funding (PMCF, Vanguard)</td>
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<tr>
<th>Barriers</th>
<th>Only 1/5 of PMCF money given by NHSE, Vanguard will be used to further tech development</th>
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<tr>
<td></td>
<td>Initial reluctance of patients to use new methods of contact</td>
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**AT Medics**

AT Medics is a general practice provider company operating 24 practices and a number of urgent care centres across South, East and West London. Run by six directors and serving 130,000 patients, the company was established in 2003 with the aim of delivering high quality general practice. One of its founding principles was a commitment to education and training.

This commitment to training and education was originally delivered via in-person sessions run by directors who travelled between practices. As the company grew and took on more practices, this became increasingly challenging and costly. Since 2012 and the advent of Webex technology, AT Medics has adopted a virtual approach to its training programme. The technology is now used to deliver the majority of their education programme and has enabled them to expand and extend the home and scope of training offered. Despite other, sometimes free, technologies being available, AT Medics has chosen to use Webex because of its N3 capabilities. Although the company does not formally measure the impact of its training programmes beyond gathering feedback from participants, the directors feel that it has a positive impact on professional experience, staff retention and, because of its ability to share good practice and standardised protocols, on clinical quality and patient satisfaction.

The main enabler identified by the organisation is their relatively lean management structure which means that they were “just able to do it”. Strong and stable leadership and a genuine commitment to embedding learning in the organisation have also played their part. AT Medics would like to go further and make greater use of technology in its education programme and beyond but it is facing a number of challenges. A lack of interoperability between clinical systems poses a barrier to information sharing.
Developing a telephone triage hub across the organisation has been met with challenges due to CCG reluctance to allow data to be shared across boundaries. Furthermore, the transience of national funding has made embedding technologies problematic. One example given was of text messaging – national funding was provided to local commissioners to get the service started but is now being withdrawn by the CCG, the result being that providers themselves have to absorb the costs or they will have to stop offering the service.

At a glance

<table>
<thead>
<tr>
<th>Technology employed to improve education and training</th>
<th>Webex technology</th>
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<tr>
<td>Enablers</td>
<td></td>
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<tr>
<td>• Lean management structure</td>
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<td>• Strong and stable leadership</td>
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<td>• Commitment to learning</td>
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<td>Barriers</td>
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<td>• Lack of interoperability</td>
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<tr>
<td>• CCG reluctance to allow data sharing</td>
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<td>• Unstable funding flows</td>
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West Wakefield

West Wakefield Health and Wellbeing Limited is a GP federation consisting of six GP practices which have been working together as a commissioning network. In response to an ageing population and particular difficulties with life-limiting long-term conditions, a high prevalence of mental health problems and elevated levels of obesity, the federation set out to improve access to primary care, improve coordination and integration with other services, and increase technology use and support for self-management. The federation currently provides care for approximately 65 000 patients, although a recent successful Vanguard bid will see the federation join two other commissioning networks to provide care for approximately 150 000 patients.

The programme has changed the skill mix in primary care to improve patient access (in addition to extended opening hours and the provision of remote consultations). Patients have the option of seeing an alternative to a GP through the “Physio First” and “Pharmacy First” schemes, supported by care navigators operating in each surgery and digital navigation resources available on-line. A care navigation app provides a logical decision tree, helping patients find the most appropriate care. It asks questions such as “have you had these symptoms before” and signposts patients to information and resources, as well as alternative services such as physiotherapy, pharmacy and mental health services, before eventually offering a GP appointment if appropriate. There are also a number of initiatives to support self-care and prevention, and integration across the six practices is facilitated through shared records.

Signposting to other services through the “Physio First” and “Pharmacy First” schemes has seen an increase in referral rates. Between December 2014 and May 2015 there were
1,124 used appointments with the physiotherapist (a monthly average of around 190 appointments compared with the baseline of 132 used appointments). Care navigators are estimated to have helped save approximately 66 GP hours per month (the equivalent of approximately 400 GP appointments per month) and the digital care navigator is also likely to have contributed to this increase.

The initiative received funding through the PMCF, and reported to have spent almost £800,000 up to the end of March 2015. A number of governance and leadership mechanisms were important to the programme’s success including: a strategic level programme board (comprising a quality lead from the CCG, a patient representative, external accountancy and independent auditors); a patient panel (involved in the recruitment of staff and procurement and assurance processes of services); a designated pilot lead for each practice; and a project delivery team. The pilot also used resources to free up time for clinical leaders to focus on strategic objectives rather than clinical care. Other enablers included engaging with key stakeholders; maintaining flexibility around the use of available resources and the use of a multi-disciplinary team; strong communication and collaboration between the senior clinical team and the CCG; and realistic ambition with an awareness of restrained resources and dependence on high levels of staff commitment.

At a glance

<table>
<thead>
<tr>
<th>Technology employed to support skill mix change</th>
<th>Digital care navigators</th>
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<tr>
<td><strong>Enablers</strong></td>
<td>• Strategic level programme board</td>
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<td>• Patient panel</td>
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<td></td>
<td>• Designated pilot lead for each practice</td>
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<td>• Project delivery team</td>
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<td>• Resources for clinical leaders to focus on strategy</td>
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<td></td>
<td>• Engagement with stakeholders</td>
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<td>• Flexibility</td>
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<td>• Strong communication</td>
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<td>• Realistic ambition</td>
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| **Barriers**                                  | • Staff time involvement |
|                                               | • Local evaluation requirements |
|                                               | • Sustainability         |

**Better Together**

Better Together is an Integrated Care Transformation Programme created to develop a joined up way of working for health and social care. Its formation was driven by financial and sustainability concerns, as well as a changing population health profile and needs. It is a collaboration between the Mansfield and Ashfield, and Newark and Sherwood CCGs, the Nottinghamshire County Council, all NHS health providers and voluntary sector partners in the districts of Ashfield, Mansfield and Newark and
Sherwood (Nottinghamshire Health care Trust, Sherwood Forest Hospitals), and covers a population of 320 000 patients.

The programme started in 2013 and has since been implementing integration projects across organisations, such as the expansion of multi-disciplinary, joined-up community teams across both CCGs and the deployment of care navigators for guiding patients to the right service. A number of strategies around workflow and workforce management efficiencies have been developed to support collaborative teams working in new settings. These include a dynamic systems modelling tool for workforce planning; tools to improve information sharing and electronic workflow (e.g. shared care records, a Medical Interoperability Gateway and technologies to facilitate the smooth handover of tasks within a care package); and technology to support mobile working (e.g. community teams using iPads ‘in the field’). These strategies will allow the organisation to overcome barriers associated with IT capability, information sharing between providers and staff working in new ways.

Integration between organisations was accelerated in April 2015 by leaders agreeing to form an alliance of providers and commissioners under a single contract, using the “most capable provider” approach [1], which required work streams to be put in place.

Although it is too early to assess the impact of the new approach, early monitoring of key performance indicators suggests a decreasing trend in primary care referrals to secondary care and admissions through A&E.

At a glance

<table>
<thead>
<tr>
<th>Technology employed to support efficiencies and workforce management</th>
<th>• Workforce tools (e.g. for profiling of current workforce supply and future demand)</th>
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<tr>
<td></td>
<td>• Shared EHRs (via Medical Interoperability Gateway).</td>
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<td>• Mobile working (e.g. community teams using iPads in the field).</td>
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<table>
<thead>
<tr>
<th>Enablers</th>
<th>• Vanguard support and funding for taking programme's plan forward.</th>
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<tr>
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<td>• Implementation of single-contract accountable provider alliance for encouraging providers to work together.</td>
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<tr>
<th>Barriers</th>
<th>• Information governance and information sharing between organisations</th>
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<tr>
<td></td>
<td>• Adaptation of professionals to new systems and applications</td>
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<td></td>
<td>• Gaps in IT capability</td>
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The future of primary care: New models and digital requirements

- Ensuring the appropriate level of staff engagement
- Workforce recruitment into new roles and new ways of working.

VitruCare

VitruCare is an online care planning and digital services delivery platform for patients. It is prescribed to patients by their GP, who then supports patients to use the care plan to change their lifestyle and improve their overall health. The service is currently operating in about 30 practices covering a patient population of around 350,000.

The development of VitruCare was driven by the need for doctors in primary care to work and manage their workload more efficiently, while empowering patients to be more autonomous in managing their health and care. The platform allows patients to monitor their condition (e.g. diabetic patients can measure their glucose levels) and enter their readings from home, which the health care team check and monitor to ensure the patient is moving towards his personal, individually-set goals. Other digital functionalities include secure messaging between the patient and the health care team and a social media tool for linking with other patients. Telemedicine consultations and integration with other clinical systems will be available in the future.

Despite some initial scepticism from providers and commissioners, the success of VitruCare has been enabled by patient and CCG interest and buy-in, as well as the involvement of professionals in its development.

A study of the innovation showed health care contacts declined by 53 per cent, with 71 per cent fewer A&E attendances and 83 per cent less acute admissions after patients had adopted care planning. When comparing the year before and after introduction of care planning, total costs were also reduced from £97,534 to £42,752 (Ali et al., 2011).

At a glance

<table>
<thead>
<tr>
<th>Technology employed to support patient empowerment</th>
<th>Patient portal (for care planning and management)</th>
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</table>
| **Enablers**                                      | • Wide interest and high engagement from patients with the service  
|                                                   | • Joint development of the service by practitioners, technological experts and with patient input.  
|                                                   | • Buy-in from local CCG                       |
| **Barriers**                                      | • Scepticism from commissioners and providers.  
|                                                   | • Initial practice engagement.                
|                                                   | • Technical challenges in development and refinement of the digital service. |
South Somerset Symphony

The South Somerset Symphony programme is an Integrated Primary and Acute Care System (PACS) resulting from a partnership of the Yeovil District Hospital NHS Foundation Trust, Somerset CCG, South Somerset Health care GP Federation and Somerset County Council. Driven by financial constraints and the high costs of treating an ageing, largely multi-morbid population, the programme aims to deliver integrated care through three integrated care hubs and a single personalised care plan. It has a particular focus on complex, multi-morbid patients. The one operational hub has approximately 80 patients enrolled, 20 of which are using telehealth for monitoring their conditions. New models of care are being developed aimed at chronic patients with different levels of complexity – the extensivist complex care model, the enhanced primary care model and proactive health and wellbeing services – and new ways of working are being tested (e.g. non GP-led practices; training and deployment of ‘health coaches’). The Patient Know Best web platform is used by health care teams for coordinating patient care around their single care plan, it facilitates interaction between patients and the integrated care hub team (e.g. through messaging or Skype), and it engages patients in their own care (e.g. access to their co-designed care plan, lab results with alerts, telehealth, etc.).

Although defining responsibilities for patient care between practices and the integrated care hub has been a challenge, organisational integration will be facilitated by working as a joint venture model.

Although no robust outcomes are yet available, preliminary results based on small numbers of patients (58 hub patients over two months) show a reduction in the number of admissions (3 this year against 10 in the previous year) and A&E attendances. Future programme plans include becoming an Integrated Accountable Care Organisation (IACO) and holding a single budget for the population covered.

At a glance

<table>
<thead>
<tr>
<th>Technology employed to support integration</th>
<th>Patients know best platform/portal between the patient and the hub</th>
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<td></td>
<td>Shared records between the practices and the hub.</td>
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**Enablers**
- Using a wider range of professionals for running practices (instead of traditional GP-led model).
- Transition into a joint venture model facilitating organisational integration

**Barriers**
- Working out the relationship and responsibilities between the integrated care hub and the practices
- Worries from practices about financial impact of handing patients to the hub
- Primary care contracts
- Procurement rules
5. What does this mean for the future of primary care?

“The paradox of the future health system is that we will have much more primary care, and primary care will be more important than ever, but it will be supplied predominantly by patients and non-physicians, with back up from specialized primary care providers who are master diagnosticians and clinical decision makers, powered by health information and organizational supports”

David Blumenthal, Medical Professionalism in the New Information Age

Taken together, the trends in primary care, enabling technologies and examples of pioneer organisations paint a picture of what the future of primary care could look like:

- Primary care practices will be part of scaled organisations taking responsibility for local populations.
- Permeable boundaries between primary, secondary and community care supported by shared electronic health records and data, professional-to-professional telehealth and improvements in back-end technology such as e-rostering and finance systems.
- A much more diverse primary care team in which GPs act as consultant and expert for the rest of the team with ready access to the expertise of their secondary care colleagues.
- Improved patient access supported by remote consultations, mobile working, sign-posting to other services and alternatives to GPs within the primary care team.
- A population based and more proactive approach, as well as increased continuity for patients with complex needs using shared data and electronic health records.
- Empowered patients supported by patient portals, peer support services and improved access to information and resources.
- Improvements in quality of care supported by computerised CDSS and an increased emphasis on on-going professional development and education supported by virtual communities of practice and online knowledge sharing platforms.

Figure 1 below depicts how primary care is changing and the associated enabling technologies.
The way in which primary care interacts with the rest of the health care system will constitute one of the biggest changes to service delivery. Increasingly tasks and responsibilities are shifting from secondary care to primary care. A recent report has set out the difficulties at the primary and secondary care interface which include a lack of sufficient communication between the two sectors; complexities in GPs booking appointments for patients in secondary care and ensuing problems when they do not attend; and issues around discharge letters including unclear information and inappropriate referral of burdensome follow-up care (Clay and Stern, 2015). Much of this could be addressed through shared IT systems and access to data along an entire care pathway supported through sound policies on interoperability and information governance. Joint care planning, budgets and commissioning would also enhance integration as would multi-disciplinary teams that work across sector boundaries. Figure 2 sets out factors to enable integration and collaboration across the system.
How do we get there?

Our research has revealed key challenges facing primary care organisations in realising this future. This section sets out local challenges and national challenges and how they have been overcome by primary care organisations to date, as highlighted by our case studies and a workshop with users of technology in primary care.

Overcoming local challenges

Ensuring clinical and patient buy-in

Professionals and patients often challenge innovative ways of working and the use of new technology. Professionals are often concerned about an increase in their workload, data security and patient confidentiality associated with the technology, the cost of the technology and decreases in quality of care (offered through remote consultations for example). The latter is also a concern shared by patients.

Key solutions for addressing these challenges include a clear communication strategy with patients and professionals; engaging patients and professionals in the process of change; demonstrating benefits of change at an early stage; providing training and support and deploying effective leadership and governance mechanisms such as clinical champions of change and a project delivery team.

Addressing gaps in IT capability through appropriate funding

Technology is playing a vital role in ambitious plans for transformation in many primary care organisations. As such, gaps in IT capability or IT infrastructure (e.g. hardware, software, technical support, compatibility issues) can hinder transformational progress.

Organisations need to be able to invest in technological solutions. Our case studies revealed that additional sources of funding (often national funding streams e.g. PMCF...
or the Vanguard programme), was a key enabler in implementing transformational programmes. However, while investment was needed for initial transformation, most organisations had plans in place to ensure long-term sustainability of the new service model. Moreover, one organisation had a formal strategy for IT procurement and development in place.

In addition to national funding streams, several organisations also sought private sector funding as a means of acquiring complementary investment and/or expertise (e.g. technological expertise that the organisation may be lacking).

**Ensuring engagement and buy-in from CCGs**
Ensuring engagement from CCGs is a particular issue when individual practices would like to procure digital solutions from commercial providers. In the case of VitruCare, the CCG was initially resistant to the new technology. This was overcome by demonstrating the benefit of the technology, although this approach presents difficulties when evidence on impact is unavailable. There is a tension between risking failure through innovative solutions and rigidly implementing solutions proven to be effective. During this transitional phase in primary care, there may be a role for NHS England to play in sharing risk (see Appendix 1).

Other strategies used for ensuring CCG buy-in include identifying existing demand for the innovative approach by demonstrating provider or patient interest and engaging CCGs on strategic-level programme boards.

**Accounting for staff time**
Transformational change requires significant staff time for implementation and change management, training and the learning of new processes. This poses significant challenges for organisations already operating at maximum capacity.

To address this challenge, organisations have invested resources to free up time for clinicians to focus on strategic objectives and developed plans to ensure staff engagement and commitment (e.g. action learning sets, focus groups, etc.). In addition, a number of organisations are developing tools for improving the efficiency of staff deployment across different levels within the organisation (e.g. electronic allocation and management of tasks; linkage of workforce planning and finance systems to patient care plans).

Accurate estimates of required time commitments can act as an important enabler in planning and ensuring buy-in.

**Overcoming national challenges**
There are also important national-level challenges encountered by most organisations implementing transformation plans and innovative IT solutions:

**Addressing Information governance**
Information governance (IG) is a key concern for data sharing across organisations and between providers and patients. This is becoming more important as organisations are working more collaboratively and patients are increasingly expecting ownership and control over their health data.
At present there is a tension between the Health and Social Care Act 2012 which sets the expectation that personal confidential data will be managed centrally (for purposes other than just for direct care) in order to protect confidentiality, and the Data Protection Act 1998 which stresses that patients must be informed about how their data will be used\(^2\).

A number of stakeholders expressed the need for clear statutory guidance to enable effective data sharing, and this will need careful consideration by NHS England (see Chapter 6). At present risk-averse data managers in primary care organisations are perceived to prevent innovation due to concerns about accountability. The section 251 approval process with the Confidentiality Advisory Group is also seen as overly cautious and burdensome. In one instance, after a 14 month approval process, an Integrated Care Pioneer site was granted the ability to share health and social care data for 12 months only, and some of the patient groups best placed to benefit from joint care planning and had to be excluded from data sets (e.g. people with mental health conditions, learning difficulties, and sexual health issues, as well as children) (Parker, 2015).

There may also be a role for NHS England to play in recommending which technology is secure from an IG perspective (see Appendix 1).

**Ensuring interoperability**

Interoperability of health information systems is essential to effective integration and collaboration. At present, different clinical systems within general practice (e.g. EMIS and SystmOne) do not work together, and this is compounded by the multitude of systems in use in secondary and community care.

A national response is required to ensure this is addressed, as clinical systems providers have little incentive to collaborate in finding a solution, despite having publicly agreed to collaboration (see Appendix 1).

**Primary care contracts and procurement rules**

NHS procurement rules can inhibit the timely adoption of new innovations. Chapter 6 sets out a range of options for NHS England to consider in ensuring organisations have the flexibility both to innovate and take advantage of new innovations on the market.

**Stabilising funding flows**

A key challenge faced by organisations implementing new solutions is a reliance on limited funds – such as those awarded through the PMCF. This can impact on the sustainability of new models and the scaling up of pilot projects. In addition, some practices reported they do not know what their budget will be until well into the financial year, which hinders planning.

On a smaller scale, we have also identified a challenge around high licence fees which often account for a significant proportion of practices’ IT budgets.

Many stakeholders feel there needs to be improved funding for general practice particularly in relation to IT. Appendix 1 sets out funding options for NHS England to consider.
6. Conclusion

This report has shown that the landscape of primary care is changing rapidly, driven by a variety of pressures including demographic change and resource constraints. Central policy has also been playing its role in shaping the organisational and service delivery landscape. We have been observing the emergence of increasingly large GP provider units for some time, but this trend has recently gathered pace, driven largely by a need for sustainability and catalysed by the publication of the FYFV. In the context of widespread at-scale working, we expect to see new organisations focusing on integrating care pathways and teams, proactively providing care to the population, improving access in line with policy expectations to increase possible modes of contact, and using clinical decision making tools to decrease variation and increase the number of care pathways in primary care, therefore moving more care out of hospital. A number of supporting trends will facilitate the key trends, such as more a more diverse primary care team, improved on-going education and training for all staff, and patient empowerment.

Given the way in which primary care is evolving, we suggest that three technologies should be prioritised locally and nationally:

- Shared electronic health records (supported by sound interoperability and Information Governance mechanisms) to facilitate coordinated care
- Telehealth solutions to improve patient access to services and professional access to specialist expertise
- Patient tools and resources such as portals which facilitate booking appointments online and access to records, information and advice

Where organisations are working at scale, integrated back-end solutions are also likely to be important in realising efficiencies.

However, there is a long way to go before digital technology can improve the working lives of professionals and have an impact on patient outcomes. A range of barriers are stifling innovation and technology uptake. Even advanced organisations in this field report challenges and frustrations in adopting or fully exploiting existing technologies and in pursuing future developments.

Much of the hard work needs to be addressed at a local or organisational level - such as resistance to new technology or lack of clinician engagement in organisational change. Furthermore, the local IT capabilities that dissipated when Primary Care Trusts (PCTs) were decommissioned should be redeveloped within CCGs and at-scale primary care organisations - including skills to develop and deliver IT strategies, as well as skills to build robust business cases and procure suppliers.

There are also issues that need to be tackled at a national level. NHS England, along with other national bodies, has an important role to play in fostering an environment that supports local freedom to innovate and adopt technological solutions. However, it must navigate a path which balances central direction and ensures rigorous data standards with support for local flexibility and autonomy. Too many national requirements are likely to stifle innovation, whereas complete devolution risks data governance and quality breaches.
It is essential to bear in mind that primary care is in a transitional phase. The current transformation effort is being driven by pilots and short-term programmes, many of which will not prove sustainable in the long term. During this phase of rapid and potentially radical change, there is need for high levels of long-term investment in infrastructure, software, and training, much of which could be facilitated by NHS England.

In the longer term, when service models and their technologies are operating effectively and organisations are mature, the role of NHS England is likely to change. It must reflect on what level of innovation is desirable and achievable on an ongoing basis and what level of investment it is prepared to make in the long term. Also, where does it want to strike the balance between long term stability and innovative disruption? And how will it keep pushing progress and innovation in a post-transition primary care landscape?
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Appendices

Appendix 1 - Issues for the Centre to consider

Having set out what the future of primary care is likely to look like, and the local and national challenges in getting there, this section highlights the pertinent issues for the Centre in realising this future, and a range of options available to NHS England. These are organised under three main categories: options for funding; issues to consider in driving data sharing; and approaches to stimulating innovation.

Funding

Historically IT in primary care has been paid for centrally, and this is one of the reasons GP IT is relatively advanced compared to secondary care. However, as our review has demonstrated that the emerging landscape is one of variety and complexity. Given this variation between models developing locally, empowering commissioners and providers to act as informed buyers may prove more fruitful than procuring IT at a national level.

We set out three overarching modes of funding for consideration (which could be used simultaneously or exclusively), and the risks and benefits associated with each:

1. **Contract**: A set amount of funding based on the practice population (or other criteria) allocated to all GP practices or CCGs on a fixed term basis
2. **Incentive mechanism**: Funding allocated based on compliance with digital criteria e.g. data standards, data collection, level of digital capability
3. **Digital technology funding streams**: Funding allocated to successful applicants to funding streams for digital innovation or improvement

Contract funding

It may be most useful for NHS England to continue providing “base funding”, and providing flexibility around whether funds can be used for innovation or service re-design. A key theme from our workshops and case studies is the need to get the basics right – i.e. tackle a lack of communication, replication of work and medical errors through functional electronic health records which are interoperable and enable data sharing with other providers. Contract funding could act as a strong national lever to ensure all practices reach a base level of digital compliance.

In addition, we heard that providers often do not know the amount of funds they will receive for the year and are hesitant to self-fund innovative projects because they worry the Centre may shortly after make national ‘theme-based’ funding available. The lack of certainty hinders planning and implementing digital solutions as and when they are needed. Contract funding can address uncertainty on the annual funding amounts by guaranteeing all providers a set amount of base funding every year based on specified criteria such as the size of the practice population (as Securing Excellence in GP IT currently does), and potentially providing estimates in the year ahead to help practices better plan.

However, if a large proportion of the digital primary care budget is allocated through prescriptive contracts (and not supplemented by other funding modes) local innovation may be hindered. Given the variation in local care models, this kind of approach is not likely to be effective.
In addition, depending on the criteria used for allocation, base contract funding has the potential to maintain technological inequalities. Contract funding may mean those at the frontier of digital technology will remain so, and those lagging behind with implementation will fail to catch up.

**Incentive funding**

An incentive mechanism would allow funding to be allocated based on pre-determined criteria set by the Centre. This could be conforming to set data standards, ensuring complete record keeping, investing in digital capacity or committing to interoperability for example. In the US, the *Meaningful Use* programme, which requires all health care providers to reach a certain level of digital maturity before receiving funding, has led to significant improvements in digital uptake.

Delivering funding through incentives would mean that the Centre maintains control of digital implementation and maturity. Organisations could be rewarded for compliance – and the Centre would retain the flexibility to alter the incentive structure as service delivery models and digital technologies evolve. This mechanism would help to ensure digital and data standards become embedded in primary care.

However, if funding is allocated based on compliance with set criteria, a central mechanism will be needed to audit general practice organisations. This could be relatively simple if the criteria is based on procuring specific digital capacity, but may become more complex if it is based on complete record keeping or particular data standards. Moreover, incentive funding can be associated with an artificial performance ceiling. It can mean organisations lose the incentive to go beyond the criteria rewarded through incentive payments.

**Digital technology funding streams**

Digital technology funding streams mean that individual organisations can apply for funding as and when they need it. At present, funding streams such as the Prime Ministers Challenge Fund have served this purpose. This mechanism allows for a variety of local solutions to develop and avoid the top-down prescription of systems or service delivery.

This approach also enables the Centre to maintain firm budgetary control. It can decide how much is awarded, to whom and when, without an on-going commitment to recipients. In addition, it means specific organisations can be targeted and the criteria for receiving funds could vary based on the Centre’s priorities. These may include funding for advanced technology performers, struggling technology performers or organisations of a particular size.

However, initiatives funded through one-off payments often face issues around sustainability. One way around this may be to ensure funded projects include a business plan that sets out steps to make the project sustainable, although this approach is not always successful – and pilot projects often do not continue after funding runs out.

Moreover, employing prescriptive criteria for administrating funding has the potential to stifle local innovation. Targeting organisations struggling to implement technology may hold back advanced organisations from pushing the digital frontier. In addition, targeting particular organisations has the potential to cause resentment amongst those not eligible for funding.
Finally, this mechanism would require Central resources to assess applications, award funding, and ensure evaluations are completed for each initiative.

**Issues to consider**

**Who should be allocated the funding:** Funding could be allocated to either individual practices or CCGs. The decision will need to be made based on the desire for regional standardisation and gaining economies of scale, versus enabling innovation at the Practice level. There may be advantages to CCGs becoming informed buyers and deciding on appropriate local solutions, although there may be tensions between the technological solutions practices would like to employ and those CCGs are willing to fund. Complexities could also arise if different GP provider models with different needs are developing in the same CCG. If funding is to be allocated to large-scale GP providers such as federations, a new contractual vehicle will need to be developed to ensure the resource flows to the overarching entity rather than individual practices where there is no obligation for them to pool funding.

**Central prescription vs. local autonomy:** The Centre needs to make a decision on how prescriptive to be with funding. In terms of “getting the basics right” specifying that a proportion of contract funding should be spent on data analysts or training for example may be effective, but for organisations already at the frontier of digital technology, this may be overly restrictive.

Similarly, incentive programmes and funding streams require decisions to be made on what should be rewarded. Many issues may be addressed by employing mixed funding modes. For example, contract funding could be employed to all to ensure basic digital standards are met, an incentive mechanism could be put in place to inspire organisations to use technology more effectively and technology funding streams could be used to target those lagging behind digital technology that are unable to access incentive payments.

**Flexibility v. security:** Whilst there is a clear benefit to having guaranteed funding sources to allow for long-term investment, there are also benefits to developing an approach that allows for changing contexts. Offering GPs a guaranteed annual sum may offer security and enable long-term strategy, but it affords the Centre very little flexibility in targeting resources to meet a changing context or to address a specific issue.

**Contract funding rounds:** At present contract funding is allocated on an annual basis. However, given uncertainties providers face about how much funding they will receive each year, there may be a rationale to extend funding rounds beyond one year – enabling organisations to make long-term plans more effectively. This may also facilitate investments in technology that will take over a year to return an investment.

**Enabling effective data sharing**

At present there are considerable system-wide barriers to effective data sharing around technical interoperability and information governance. Working across organisational and sector boundaries is severely hampered by systems that do not talk to each other. This has been a long-standing issue in attempts to integrate primary, secondary, community and mental health services but it is also a significant barrier to collaborative working across GP
practices. In this section, we consider the main issues that NHS England needs to bear in mind in deciding its approach to this challenge.

Ensuring interoperability: NHS England has three key options to ensure interoperability – prescribing a single system for all practices, setting minimum interoperability standards for all technology used in the NHS or allowing the market to find the most appropriate solutions (while encouraging both technology and health care providers to commit to interoperability). It should be noted that interoperability is required across the entire health and care system, so a coordinated response across sectors is likely to be required.

Each option has its own benefits and risks. A prescribed system would ensure interoperability and remove current barriers associated with mergers and subsequent system migrations. However, the National Programme for IT (NPfIT) revealed significant problems with top-down implementation, particularly around cumbersome technological solutions which were not always fit for purpose locally. Failed implementation attempts can be costly. Moreover, a prescribed system may stifle local innovation and in the time taken for implementation, technology may have moved on.

The GP Systems of Choice (GPSoC) framework contract, which is considered to have been a key enabler in the past, is now challenged in facilitating interoperability for future models of care in general practice. Setting minimum interoperability standards does guarantee a base level of interoperability. However, NHS England would need to make a decision on whether these standards only applied to new technologies as and when they are procured, or whether existing systems need to be replaced. It may be that interoperable modular software which sits on top of existing systems can address some of these challenges. This approach would also maintain a competitive commercial market which is needed for continued innovation. However, organisations would need a good awareness of the systems they were procuring and there may be a role for NHS England to approve particular suppliers – to ensure they are complying with the standards.

Finally, allowing the market to provide the best solution may stimulate competition and there is scope for the Centre to encourage both purchasers and providers to commit to interoperability. However, this approach risks no progress towards interoperability particularly given that GP organisations reported feeling powerless in the face of technology providers. Without some Central levers, this seems unlikely to bring about change.

Clarifying information governance legislation: Ensuring clear IG rules are in place is essential for primary care to realise improvements offered through data sharing. Now the National Data Guardian is in place and the National Information Board is considering these issues, it will be important to ensure challenges around IG are resolved in a timely fashion. Advice from Integrated Care Pioneer sites suggests that local areas might benefit from national guidance on how to complete the Confidentiality Advisory Group process, including when would be best to engage with clinicians and the public to gain support for innovative change. Clear legislation around sharing patient data (both with patients and other providers) is required to allay fears over misuse of information, confidentiality and security.

Central approval: There may be a role for NHS England to play in approving the technological solutions or the providers of those solutions within primary care. This would mean the Centre would be accountable for ensuring safe systems are in place that adhere to
minimum requirements or standards, and would remove these concerns from practices or CCGs, which may not have the capacity or expertise for such decisions.

**Innovation**

There is a clear need for greater innovation in technology for primary care. Many of the issues explored under funding and interoperability are relevant to discussions around driving innovation. However, there are a number of other factors that NHS England needs to be mindful of when developing an approach to driving innovation.

**Support for innovation at the right scale:** There are several ways in which NHS England could support innovation. Regional innovation hubs would benefit from economies of scale and innovations could be developed and tested on a large scale, rather than through small local pilots. This approach would also spread the risk of failure which may enable the hubs to push the frontier of what is possible in primary care.

However, concentrating resources in small number of hubs may reduce the number of bespoke local solutions to particular problems and gaining sufficient clinical involvement in new developments may be a challenge.

An alternative approach may be to allow local solutions to develop at a local level, which runs the risk of letting ‘a thousand flowers bloom’. If this approach is taken, NHS England must consider how far it wants to be able to scale successful solutions and employ them in areas of need. One advantage of this approach would be that multiple solutions could be trialled simultaneously enabling NHS England to take advantage of, and spread, best practice across the country. The risk would be that innovations are too specific to the locality in which they were developed and, therefore, not transferable to other localities.

**Maximising investment:** NHS England must think through how to support innovations which could be implemented across multiple practices or organisations. There are various options for this in the short term, including forming Public-Private Partnerships with technological providers or giving match funding to individual practices. NHS England could share IP in the innovation or ask for a certain percentage of the funding (or the profits made) to be returned if the solution is sold commercially for profit. In the long term, any upfront investment needs to be weighed against potential long term risks and efficiency gains in the system.

**Ensuring patient and clinician engagement:** Regardless of the scale of innovation or funding mechanism, it will be crucial that any approach to innovation has patient and clinician engagement embedded within it. The ultimate product needs to reflect what is wanted on the front-line of care delivery. Similarly, given that many new models of care assume that patients will have access to care records or self-management information and so on, it will be crucial that patients are also involved from an early stage.

Finally, a number of issues must be considered which cut across NHS England’s goals and responsibilities.

**Clarity of roles and rules:** Clarity over the respective roles of the Centre versus local organisations and practices would be helpful in managing expectations and in reducing the potential for over-lap and duplication. By setting out the high level framework in terms of
funding and, where appropriate, minimum requirements, NHS England would by default clarify its expectations of local organisations.

Similarly, there is a need for clarity about the rules within which technology is to be developed in future. An overly time-consuming procurement system can reduce an organisation’s ability to respond to a need in a timely manner and thus stifle innovation. Commissioners and providers of technology need to be clear national guidance as to when to apply strict procurement rules and when the regime can be flexed to enable innovation.
Appendix 2 – Description of commission

In 2015, in response to the changing landscape in primary care, NHS England put in place a Primary Care Digital Enablers (PCDE) Programme aimed at developing a national digital strategy for primary care.

The PCDE programme sought to address three main questions:

1. What is primary care going to look like in the future?
2. What will be the impact of the digitally enabled patient on primary care?
3. What is NHS England’s role in shaping the commercial marketplace for clinical systems (and what should be left to local levels)?

In order to answer the three questions, NHS England developed three matching strands of work, and sought the advice of external independent research organisations. The Nuffield Trust was commissioned to address the first of the three. This involved the Nuffield Trust reviewing the current challenges facing primary care, the emerging trends in policy and practice in the primary care, as well as the emerging trends and the likely future implications for technology and digital requirements.

This review was to be delivered within twelve weeks of appointment, during which the research team undertook an analysis of the policy context and developed an evidence framework, undertook a review of academic and grey literature, identified and explored six case studies in detail, and facilitated two workshops with stakeholders.

This report is the final output of this research, in which we set out the findings of our review and consider the role that NHS England can play supporting the technology agenda in primary care.
Nuffield Trust is an independent health charity. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.