

# Technology, infrastructure and data supporting NHS staff

Caring, supportive,  
collaborative



**a future  
vision  
for the NHS**

# Contents

<b>1. Introduction</b>	<b>2</b>
<b>2. Prioritising IT infrastructure will lead to many benefits</b>	<b>3</b>
2.1 Better IT will reduce unnecessary workload and delays	3
2.2 Interoperability will improve care and patient experience	5
2.3 The digitisation of patient records will lead to major cost, time and space savings	7
2.4 Reducing IT failures will have a positive impact on staff morale and speed up delivery of care	8
2.5 Implementing e-rostering systems and integrating them with other HR systems will enable more efficient use of staff resources	9
2.6 PFTs (patient facing technologies) will create better communication between NHS staff and patients	10
2.7 Other significant concerns	11
<b>3. Front loaded, sustained investment will deliver improved NHS IT infrastructure</b>	<b>13</b>
<b>4. Minimum IT standards must be part of the transformation approach</b>	<b>14</b>
4.1 National standards are essential	14
4.2 The impact on users and patients must be properly considered before implementation	15
<b>5. Value for money will only be achieved through appropriate training, education and participation</b>	<b>17</b>
5.1 Staff training in new technologies is vital to success	17
5.2 Medical education, training and research need to respond to the growing use of technology in healthcare	17
5.3 Digital transformation requires an open culture and appropriate engagement at all levels of the NHS	18
5.4 Doctors and other technology users are innovators	18
<b>6. Conclusion</b>	<b>20</b>
<b>Appendix A</b>	<b>21</b>
<b>Appendix B</b>	<b>23</b>
<b>Glossary of terms</b>	<b>26</b>

# 1. Introduction

This paper sets out the BMA's vision for NHS IT (information technology). Getting this right is fundamental to the future of the NHS, and as the BMA's survey and focus groups on NHS IT (2018) showed, there are serious deficiencies within current systems. These deficiencies result in additional workload, stress and compromised patient safety, plus disquiet at the increasing amount of attention being given to innovations such as AI (artificial intelligence), rather than to creating functioning, interoperable systems. Obsolete technology such as fax machines are still routinely used across the NHS, and Matt Hancock, Secretary of State for Health and Social Care, recently insisted that the service '**axe the fax**'.

Despite the apparent lack of modernisation in NHS workplaces, this is a fast-moving policy topic. Since October 2018, we have seen the DHSC (Department for Health and Social Care) vision for IT '*The future of healthcare: our vision for digital, data and technology in health and care*', the NHS LTP (Long Term Plan), which talks about **innovation and IT**, the **Topol review**<sup>1</sup>, plus the creation of **NHSX** and various **announcements** from Matt Hancock regarding health apps (applications). Given the speed with which announcements and decisions are being made, it is essential that the views of doctors working on the frontline of the NHS are being heard. This will help to make sure that any future developments improve patient care and the working lives of NHS staff.

This paper sets out doctors' vision of IT in the NHS and is a response to the DHSC's own vision, as well as subsequent commitments made in the NHS LTP, the Topol review and other relevant reports and announcements.

1 **Topol review: Preparing the healthcare workforce to deliver the digital future** (February 2019)

## 2. Prioritising IT infrastructure will lead to many benefits

Good IT infrastructure will mean increased productivity, more time for patient facing activities and better staff morale. As the DHSC vision and the NHS LTP identify, IT infrastructure is a clear priority, and the BMA agrees that interoperability, usability and continual improvement must be central to all future contracting.

Unfortunately, the NHS is currently some distance from achieving those priorities, which was reflected in a 2018 survey of BMA members:

- Almost a quarter (22%) of respondents believe that IT systems at their place of work are not fit for purpose – specifically the electronic medical record (57%) and current operating systems (55%).
- Over half (56%) also reported that the current IT infrastructure significantly increases their day to day workload.
- One third (32%) believe that they rarely have all the necessary IT equipment to perform their job to the best of their abilities without disruption. This includes printers, computers/laptops, monitors, smartphones, tablets, Wi-Fi & broadband, with adequate speed and coverage, and scanners.
- Just over a third (37%) reported that their stress levels are affected significantly because of inefficient IT and data sharing systems.
- Over a quarter (27%) lose more than four hours a week because of inefficient hardware/systems – *if this were the case for one in four doctors working across the NHS, including foundation doctors and specialty trainees, which is currently 156,750 doctors<sup>2,3</sup>, this would amount to at least **156,750** medical hours lost every week or indeed **8,150,000** a year. This equates to approximately 4,870 full-time equivalent doctors working 37.5 hours a week over a calendar year (including leave and public holidays). The impact on other NHS staff may be similar.*
- Survey respondents were asked what they thought were the barriers to good IT in healthcare - around three quarters (74%) stated that there were too many different systems in use, approximately two thirds (63%) said that both software and hardware was outdated.

### 2.1 Better IT will reduce unnecessary workload and delays

Before we can even begin to consider the full potential of digital transformation, basic hardware needs to be upgraded to a nationally recommended standard and be fully operational. It is currently failing in too many care settings and there is often no immediate way to rectify it. Doctors and clinicians should not have to take time out from caring for patients to attempt to fix malfunctioning systems or problems resulting from system errors. For example, we are aware of more than **100,000** patient letters from secondary care to primary care being delayed (see Appendix B), which creates significant extra workload for staff and significant risk to patient safety.

Many hospital doctors believe they should be able to prescribe medication that can be collected at a patient's community pharmacy. Access to the EPS (Electronic Prescription Service) in hospitals would enable this. It would also allow doctors to continue prescribing ongoing specialist medications rather than the patient needing to receive them by post, revisiting a hospital to get a repeat prescription or visiting their GP practice and possibly experiencing delays if the prescription is beyond the GP's competence or clinical responsibility.

As needs change and systems evolve, NHS infrastructure should be flexible enough to accommodate and embed new software quickly so that staff can benefit from new technology, saving time and improving productivity. There would also be time and cost saving benefits from improvements such as interoperable systems, a reduction in the number of programmes used, which are often incompatible in the current system, and the digitisation of all patient records. Getting these things right will have positive implications for quality of care and patient safety.

<sup>2</sup> NHS Workforce Statistics, November 2018 Doctors by Grade and Specialty, NHS Digital (February 2019)

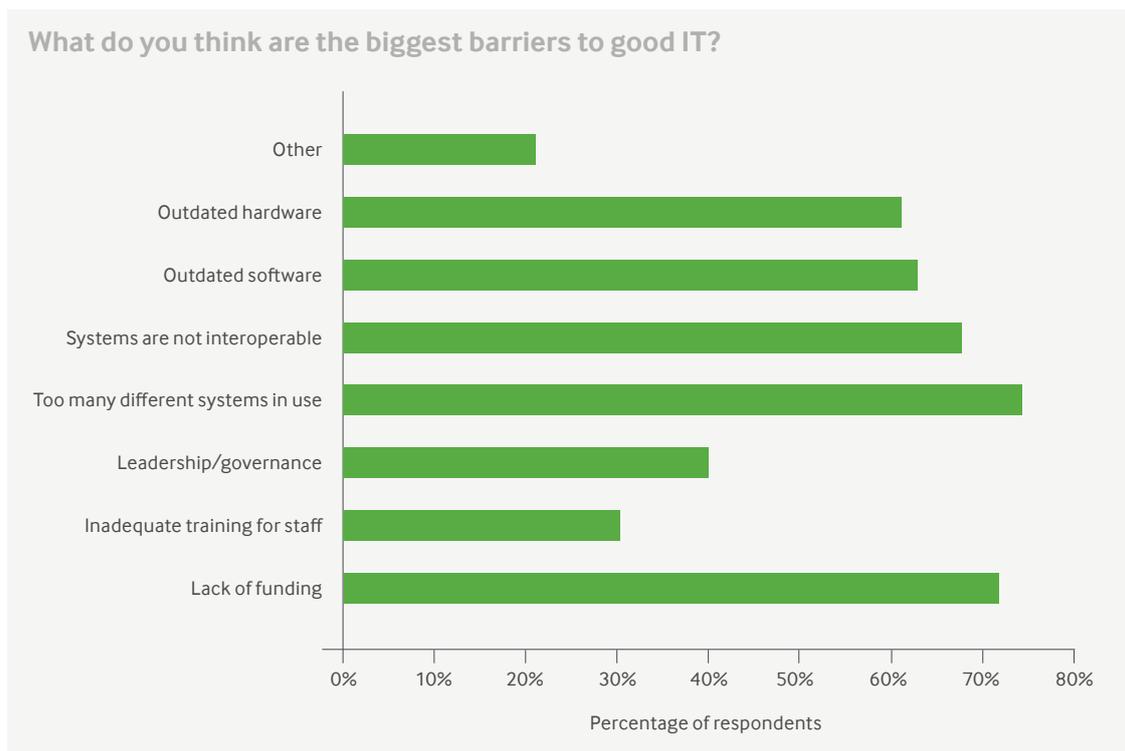
<sup>3</sup> General Practice Workforce Final 31 December 2018, Experimental Statistics, NHS Digital (February 2019)

It is therefore timely that the NHS LTP promises to ensure that 'all staff working in the community [will] have access to mobile digital services, including the patient's care record and plan' by 2019-2021. Integration and interoperability will be vital to improving NHS efficiency and patient care, and announcements such as the NHS LTP commitment to extending the **Child Protection Information Sharing project**, as well as replacing 'dozens of legacy systems and delivering a screening and vaccination solution', to cover all health care settings by 2022-23, and ensure digital access to the **Diabetes Prevention Programme** by 2019, places this into even greater focus.

### Recommendations:

- Printers, computers, tablets and smartphones need to be enabled for remote working, undergo regular upgrades and not breakdown regularly.
- Fully-functioning wi-fi and early adoption of technologies such as 5G, which will speed up the transfer of data between doctors, clinicians and providers, should be standard throughout the NHS, including care homes.
- It should be best practice for all care settings to have local and effective IT support, with 'in-house' support and consistency of approach a feature of larger providers and federated models of care.
- For primary care, an important element of transformation will be the continuation, enhancement and expansion of **GP Systems of Choice (GPSoC)** via NHS Digital's **Future GP IT systems and services** work. This will ensure all GP practices have easy access to new IT initiatives that have already proven effective.
- It is essential that all NHS providers can access the **EPS** as soon as possible, and that it is enabled for all prescribed medication including **CDs (controlled drugs)**.
- Referral processes, in particular the **e-Referral Service**, should also be digitised, simplified, work with integrated systems and reduce bureaucracy.
- We need quick and efficient messaging functionality between staff across all care settings, including intelligent auto-population of standard format letters. For example, the system ought to be able to construct most of a referral form from primary to secondary care electronically, freeing up valuable clinician time.

See Appendix A for recent BMA policy on IT infrastructure and innovation.

**Figure 1: Doctor views on barriers to Good IT**

Source: 2018 BMA survey on NHS IT

## 2.2 Interoperability will improve care and patient experience

Lack of interoperability and adequate referral communication tools, for multi-way dialogue between doctors, clinicians and other care workers, is currently impeding the quality of patient care, damaging the patient experience and affecting the way clinicians treat patients. It is therefore unsurprising that in a major 2018 survey of the medical profession, BMA members identified 'effective and interoperable IT systems'<sup>4</sup> as one of their key priorities to improve their day-to-day working lives.

As the DHSC vision recognises, efficient and consistent IT systems should mean that patients are not required to regularly repeat their medical history or care needs again and again to different people. Too often this is not the case, with different systems across health and care services, and even within a single care setting, often unable to communicate effectively with each other.

Clinicians should be able to see patients' records, observations, results and background notes from any location, ideally in real-time. Not only will this help with emergencies, where the **SCR (summary care record)** should already be readily available, but the ability to remotely add information to a file would save an enormous amount of collective time and effort across the NHS.

A good example of how the future could look is **primary care pathology report messaging**. Messages are transferred using MESH (**Message Exchange for Social Care and Health**). The MESH is the main messaging service used across health and social care, allowing health and care organisations to communicate securely. To support data quality within these messages, NHS digital provides the **NMAS (National Message Assurance Service)**, which is a fully automated service that provides messaging checking, laboratory implementation testing, clinical governance message checking and general practice response analysis. This kind of document exchange is highly regarded by doctors and clinicians alike and should be replicated across the NHS. Secondary care outpatient letters could also be automatically inserted into the EPR (electronic patient record) in the patient's GP practice IT system and include any relevant entries, results or observations.

4 **Caring, supportive, collaborative: Doctors' views on working in the NHS**

The NHS LTP commits to fully digitising clinical and operational processes across all secondary care settings in England, including acute, community and mental health care settings by 2024. It is essential that all GP and primary care settings are digitised at the same time. IT systems across all NHS sectors should then be able to talk to each other.

Quality of patient data is also of key importance. Audits to improve the healthcare pathway, for example, become less effective when you are unable to access consistent information or when there is contradictory information across multiple sources or interfaces.

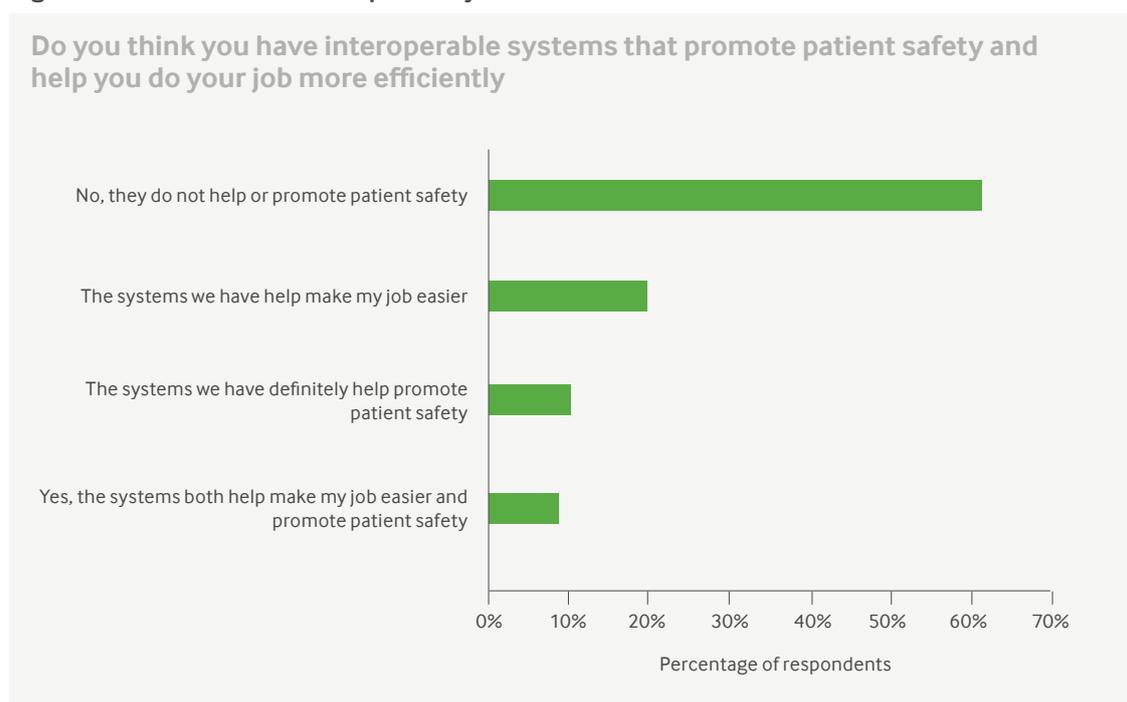
The eight geographies identified by the NHS LTP, which will deliver a longitudinal health and care record platform by 2021, will require interoperable IT systems too. From 2019-2021, the LTP also proposes to deliver systems that support population health management in every ICS (Integrated Care System) across England. Healthcare pathway auditing is therefore likely to become considerably more sophisticated, which requires reliable IT infrastructure to support it.

Some localities are already in the process of breaking down barriers between primary, secondary, community-based and social care services, which will support the provision of holistic patient services. While establishing interoperability within the NHS itself is crucial, it is also necessary across all other parts of the wider health and social care system, e.g. public health professionals, local authorities' public health function etc.

### Recommendations:

- It is essential that primary and secondary care settings are digitised at the same time to enable interoperability to be built in by system developers.
- Explore the implementation of fully automated messaging and document checking services, e.g. NHS Digital's NMAS, across health and social care services.
- Any system re-configuration should prioritise a single log-on. Implementation of finger print / face recognition technology, password management software or smart cards should be explored.

**Figure 2: Doctor views on interoperability**



Source: 2018 BMA survey on NHS IT

## 2.3 The digitisation of patient records will lead to major cost, time and space savings

To achieve the goal of an interoperable NHS IT system that enables the exchange of patient information quickly and safely between care settings, all relevant data must be stored and available in a suitable form. Currently, many GP practices still maintain substantial paper records and it must be a priority to ensure that these records are swiftly and safely digitised. Similarly, where secondary care providers store paper records off-site, this makes it more difficult to access or share the data leading to both cost and accessibility implications.

Digitised patient records will mean there is no need to use or pay for storage space or any need for NHS staff to spend time storing, securing or recalling them. The time and money saved can be put to better use. This process will require dedicated funding and a degree of national coordination to ensure that it happens quickly and safely. Time and space savings from digitisation should repay the initial upfront investment over the longer term.

To ensure data is available when required, it is also essential that no digital record is lost when a GP practice closes, or a patient leaves a practice but then does not register at another one. This will require a standard process for **GP2GP** records to be transferred and held securely until the patient registers with a new practice. This could be achieved very rapidly and cost effectively by requiring system suppliers to operate a single nominee holding account with an **ODS (organisation data service)** code, e.g. via a **primary care network<sup>1</sup>** or **GP federation**, that is recognised on the **PDS (personal demographics service)**, thereby allowing GP2GP transfers in and out.

The NHS LTP pledges to ensure every patient with a long-term condition can access their SCR via the **NHS App** by 2020, as well as introduce a digital version of the PCHR (**personal child health record**), 'removing the need for a paper record and helping children start life with a digital **PHR (personal health record)** that they can build on throughout their lives'. This adds even greater urgency to the need to digitise patient records.

### Recommendations:

- It must be a priority to ensure that all patient records are swiftly and safely digitised.
- Prioritise the completion and implementation of full **GP2GP** functionalities in all GP practices across the UK, so that patients moving in or between nations can have their electronic health records easily transferred.

1 Primary Care Networks, BMA (March 2019)

## 2.4 Reducing IT failures will have a positive impact on staff morale and speed up delivery of care

Just under three quarters (74%) of BMA members that responded to our survey work in hospital settings. Of those respondents, more than one in two respondents thought the EHR (electronic health record) / EMR (electronic medical record) or the operating system installed at their place of work was not fit for purpose. Similarly, over half of those respondents thought that the IT infrastructure in their workplace significantly increased their workload.

IT failures, or human error as result of inadequate user training, also regularly cause delays in GP practices. There have been a significant number of instances for example, where GP practices have received electronic correspondence relating to their patients in bulk, including rejected patient referrals, adding substantial workload burden and risking patient safety. Such failures will decrease in frequency through the introduction of improved systems and integration. However, while they remain a regular occurrence, providers must be assured that IT failures, or inconsistencies outside of their control, will not destabilise the service they provide to their patients, and that CCGs are making available adequate support and resources to help practices deal with incidents such as these.

The **WannaCry attack** in 2017 laid bare the dire consequences for patients when IT systems are not adequately protected, with care disrupted and operations cancelled. We welcome last year's **DHSC announcement of £150m for new NHS security measures** (2018-2021) and the NHS LTP pledge for existing IT systems to achieve '100% compliance with mandated cyber security standards across all NHS organisations in the health and care system by summer 2021'. The recent **O2 outage**, a day-long data network collapse, also gave an indication of the potential dangers in a digitally dependent NHS. It highlighted the essential need for detailed risk analysis. The commitment in the NHS LTP to introduce controls by 2019 'to ensure new systems purchased by the NHS comply with agreed standards' is also timely.

The development of backup systems will be crucial and we must learn from past mistakes, such as those highlighted in the recent **BMA** and **NAO** (National Audit Office) reports on the performance of the **Primary Care Support England programme**, run by **Capita**. Poor handling of patient registrations and medical records as part of the outsourcing of these backup systems has put patient care at risk of negative consequences.

### Recommendations:

- Electronic health / medical records and operating systems in all hospital settings must be swiftly upgraded to a nationally recommended standard and developed and integrated with interoperability, across multiple NHS settings, in mind.
- To safeguard the NHS against potential cyber-attacks and regional or network-wide outages, there should be clear standards, national and local lines of accountability and comprehensive funding to support providers.
- The development of backup systems will be crucial and commissioners must learn from past procurement mistakes.
- Providers need to be assured that they will have access to resources to help clear backlogs when IT failures lead to delays in receiving electronic correspondence relating to patients.

## 2.5 Implementing e-rostering systems and integrating them with other HR systems will enable more efficient use of staff resources

e-Rostering systems can significantly reduce the time taken to develop staff rosters, reduce agency staff use, provide more flexible and less stressful working patterns and support automatic monitoring of workforce activity and the number of medical / clinical hours available to a service / hospital department at any given time.

Currently, e-rostering systems used within the NHS do not interact with other key HR (human resources) systems, such as the **ESR** (electronic staff record) and exception reporting platforms. This segregation of platforms is creating unnecessary inefficiencies within HR processes for doctors and other NHS staff groups. It is crucial that the principle of interoperability is applied to HR systems, as well as systems supporting the delivery of care. Successful integration of these systems will relieve NHS staff of burdensome administrative processes and enable them to focus on more patient-orientated tasks.

We therefore welcome Matt Hancock's **commitment** to Chaand Nagpaul, BMA council chair, mandating employers throughout the NHS to introduce e-rostering for junior doctors, and the pledge within the NHS **LTP** for e-rostering to be deployed within all English trusts by 2021. This is an important first step before the wider integration with other HR systems. Providers will of course require resource to take these commitments forward.

### Recommendation:

- Deploy and integrate HR systems that offer working patterns that protect staff wellbeing and provide employers with a clear picture of the workforce they have and require, including necessary headroom, to staff each rota.

## 2.6 PFTs (patient facing technologies) will create better communication between NHS staff and patients

General practice already has PFTs, but they remain rudimentary. They need to be further developed<sup>5</sup> and implemented in secondary care, as doctors need simple ways of communicating with their patients. Ideally, the **NHS App will make this a reality**. According to the NHS LTP, 'the NHS App will create a standard online way for people to access the NHS', 'will work seamlessly with other services at national and local levels' and 'where appropriate, [will] be integrated into patient pathways'. The NHS App also seems like the best avenue to deliver on another NHS LTP outcome; 'all women able to access their maternity record digitally by 2023/24'.

However, for vulnerable patients, including the elderly or disabled, there can be problems with accessing information online, such as loss of sight, manual dexterity and cognitive impairment. Even jargon and website design can be difficult to navigate; these remain physical barriers. For some, the psychological barriers can be even greater. Technology can reinforce feelings of exclusion, loneliness and helplessness. If we are to prevent increases in health and care inequality, whilst developing and introducing innovation, we must keep in mind that emerging technology can be a hinderance to some patients.

Over the next five years, the NHS LTP envisages that **digital-first primary care** will become an option for every patient. If achieved, every patient in England will have the right to choose this option from their own GP practice or, if they prefer, from one of the new digital GP providers. It is crucial though that online services such as these do not increase health inequalities for vulnerable groups or destabilise traditional GP practices through divergence of CCG funding. Online consultation schemes that are not prepared to provide a comprehensive package of care for all patients are for this reason unacceptable (see Appendix A).

### Recommendations:

- PFTs should be developed further, in collaboration with users, to improve communication between NHS staff and patients, reduce admin for NHS staff and improve patient care / experience.
- Vulnerable patients must still be supported to access healthcare if they are unable to use existing and new technologies and this should not be forgotten when introducing new initiatives
- Digital-first primary care must be carefully introduced in consultation with NHS staff representative bodies to ensure it does not destabilise existing providers.

## 2.7 Other significant concerns

There are several other areas to consider when planning to introduce new innovations within the NHS.

### **E-job planning should improve productivity, not erode terms and conditions or damage workplace culture**

An NHS LTP commitment for deployment in all English trusts by 2021, **electronic job planning systems**, where functioning effectively and used as part of a collaborative approach, can be a useful tool for planning and managing doctor activity. However, this is a complex issue, with systems affected as much by technical constraints as by the management culture in which they are used. As such, we would advise that only with a careful partnership approach can e-job planning be of value to the health service. **Our own survey of consultant members** has shown that electronic job planning processes can be a conduit to facilitate bullying where implemented inappropriately.

### **Preventative technologies must not replace doctors or increase health inequalities**

While we support the development of preventative technologies, such as artificial intelligence, these must not be quick fixes or replacements for doctors. They should not be prioritised at the expense of investment in evidence-based public health services either. The development and expansion of AI, as well as the opportunities and challenges this brings, is likely to have a significant impact on all doctors and clinicians. We are developing policy in this area and believes it is vital that it is introduced in co-production with doctors and clinicians to support them in caring for their patients

Similarly, while in some cases there is value in individually tailored technological approaches, e.g. fitness watches, health apps etc, this should not be instead of adequately funded services that can be accessed by everyone. There is a risk that personal technology can exacerbate **health inequalities** as the emphasis is on individual investment. Indeed, the **Topol review** concluded that 'patients who are willing to take greater charge of their care using digital tools and algorithms will be empowered, but this should always be an opt-in choice for them'.

As highlighted by the **BMA's Patient Liaison Group**, given the possibility of fragmented healthcare access, greater consideration must be given to how individual patient health information will continue to be captured in a single medical record. Those with greater means, and therefore access to technological advances, are likely to be far more knowledgeable about the status of their own health when liaising with medical and clinical professionals. A great deal of optimism is being placed in the NHS App, but there is a long way to go before it has the functionality and capabilities required to prevent fragmentation of access. This is highlighted by an HSJ (Health Service Journal) **report** claiming the app cannot connect to any online GP suppliers.

### **Local areas pushing ahead must not leave others behind**

Locally-led digital transformation is already underway with funding allocated to a selection of STPs (sustainability and transformation plans) that will be '**Global Digital Exemplars**'. These localities have been identified as being ready to lead the way in terms of digital transformation; the idea being that they will provide blueprints for other regions to follow. It is unlikely that the remaining regions will be as well prepared as the exemplars to implement the changes and will require appropriate levels of funding and assistance to ensure that they are not left behind.

We are, however, encouraged to see that the NHS LTP will result in more Global Digital Exemplar blueprints being implemented across more 'Fast Followers' with additional central funding being made available to NHS trusts for this to happen. Care must be taken to ensure this does not create new problems with regards to interoperability and data transfer.

**Rules and regulations must protect the NHS and its patients from commercial interests**

The BMA has expressed concerns about the 2017 case of **the Royal Free London Foundation Trust being reprimanded by the Information Commissioner's Office (ICO)**. The trust failed to comply with the Data Protection Act when giving patient data to **Google DeepMind**, and the ICO investigation found several shortcomings in how the data was handled. This included patients not being adequately informed that their data would be used as part of the test. Similarly, **the 100,000 Genomes Project** – sequencing the genome of every UK patient with cancer – has huge potential commercial value. Large corporations will most likely be willing to pay very large sums of money to access this information, and the rules and regulations that enable this must protect patients whilst enabling innovation and improvements in diagnosis and treatment.

As mentioned in the NHS LTP, 'Mandated open standards' – for software interoperability, data and document formats – 'in procurement will ensure [pathology] networks are ready to exploit the opportunities afforded by AI, such as image triage, which will help clinical staff to prioritise their work more effectively or identify opportunities for process improvement' by 2021. Exploitation of assistive technologies must only be done for the benefit of patients, not with profit as the primary motivation, in the context of nationally defined IT standards and principles, as well as existing legislation, and in consultation with the doctors and clinicians providing care. This will also be the case for the diagnostic imaging networks promised by 2023, which 'will enable both the rapid adoption of new assistive technologies to support improved and timely image reporting, as well as the development of large clinical data banks to fuel research and innovation'.

Any benefits that might be gained from greater use of data and technology must be for the NHS and its patients, not for private companies seeking to profit from the vast amount of personal and clinical data held by the NHS.

**Recommendations:**

- Ensure a careful partnership approach to the implementation of appropriate e-job planning across NHS employers.
- Preventative technologies, such as artificial intelligence, should be introduced in co-production with doctors and clinicians to support them in caring for their patients. Technological innovation should maintain or improve quality and must not simply be seen as a quick fix or undermine the legitimate need for doctors and clinicians to provide services.
- To protect more vulnerable patients from suffering from greater health inequalities, patients should be given an opt-in choice when willing to monitor their own health using digital tools and preventative technologies.
- Care must be taken to avoid inadvertently creating new problems in terms of interoperability and data transfer when establishing Global Digital Exemplars.
- Before introducing technological innovations, regulations must be updated to ensure sufficient protection of patient and staff data.

### 3. Front loaded, sustained investment will deliver improved NHS IT infrastructure

Good and interoperable IT infrastructure requires funding. At the moment, IT investment is often delayed or does not take place, especially where there are deficits that need filling or other more urgent areas that require investment. Around three in four (72%) respondents to the BMA's pan-professional survey stated that the main barrier to good IT in healthcare is a lack of funding. We cannot allow this deferral of essential IT improvements to continue. User participation in digital transformation must be a local requirement to achieve best value for money too, and there are cost implications for this level of co-production, testing and evaluation.

Despite mention of investment for a few of the NHS LTP commitments, there remains very little information about how implementation of the plan's commitments will be funded. Suitable, sustained investment is therefore required to prevent commissioners and providers struggling with budget deficits from diverting funding to short term concerns.

#### Recommendation

- Implementation must include new ring-fenced funding to ensure enough resources are allocated for digital transformation.

## 4. Minimum IT standards must be part of the transformation approach

### 4.1 National standards are essential

Alongside good quality, interoperable IT and the funding required to make it happen there is a need for clear standards to enable digital transformation. Developing a set of national standards, to which local decisions must adhere, is the most sensible approach. This should include some basic expectations of what investment in IT is expected to achieve and what makes the digital service different from that currently provided, e.g. interoperable, more efficient and quicker. In addition, it should not be automatically assumed that because something is new it will be suitable for the NHS and be better than existing systems or processes. This reinforces the importance of evaluation.

The enforceability of national standards will be the crucial factor in terms of how quickly and effectively positive change can be enacted. NICE published an *Evidence standards framework for digital health technologies* after consultation with stakeholders in December 2018. Following the recent **announcement** of the creation of NHSX, we anticipate that this new organisation will lead on and coordinate 'digital transformation in the NHS'. Furthermore, the DHSC's vision and the **NHS Digital draft framework document** highlight roles for the CQC, NHS Digital and NHS Improvement in enforcing standards, and it will be crucial that these organisations are joined-up.

Although some may perceive it to be slow and inefficient, rapid implementation of digital health technologies must not be pursued at the expense of evidence-based evaluation. **Professor Eric Topol's recent review** shares this sentiment, concluding that 'implementation must only be carried out when there has been robust clinical validation'.

Successfully balancing local and national decision making in a system the size of the NHS is difficult but essential. The failure to strike the correct balance in this area has been a major factor in the IT problems currently experienced in the NHS, i.e. too much national prescription, too much local leeway and a willingness to allow people to pursue interests without proper evaluation.

#### Recommendations:

- National minimum IT standards / principles, e.g. interoperability, efficiency, improvements in care etc, need to be developed in collaboration with staff representative bodies and experts to ensure consistency of approach across local areas when procuring new technology.
- NHSX, NHS Improvement, NHS Digital and the CQC must work with staff representative bodies to develop minimum standards and ensure they are enforceable.
- Implementation of new technology and IT systems must only take place following thorough medical and clinical validation through evidence-based evaluation.
- Defined standards will ensure assistive technologies, which can help doctors and clinicians provide preventative care, diagnosis and treatment, are introduced when the benefit to patients and tax payers are fully understood.
- Innovation and development should be driven locally, based on understanding of existing infrastructure across all NHS providers in the area, and by patient need, but within nationally agreed parameters and guidelines, i.e. consistent minimum standards.

## 4.2 The impact on users and patients must be properly considered before implementation

As the recent **Topol review concluded**, the ‘patient must be considered to be at the centre when assessing and implementing any new technologies’. Too often in both primary and secondary care a new system is implemented without proper consideration of the impact on users. There is a perception that commissioners have tended to make IT decisions behind closed doors. This needs to be tackled to ensure that clinicians and patients are fully involved in the decision-making process.

At a local level, there needs to be proper consideration as to how new systems will impact on workflow and interact with existing systems – and what this means for patients. Implementation must also be driven by need rather than by the IT market. Decisions made based on patient needs should result in fewer unintended consequences after system deployment and a better judged assessment of the outcome.

From the patient’s perspective, it is equally important that the increasing use of technology in diagnosis and consultation does not lead to a deskilling of doctors. In particular, the use of effective one to one communication with patients, which is a skill valued by the public and important to effective care. Patient access to records, and their ability to interact with NHS IT systems, also needs to be intuitive and user friendly. We agree with the **Topol** review that ‘a marked improvement in the patient-clinician relationship is possible, owing to the gift of time delivered by the introduction of [new and more efficient] technologies. This will bring a new emphasis on the nurturing of the precious inter-human bond, based on trust, clinical presence, empathy and communication’.

It is also imperative that the use of patient and staff data is both appropriate and regulated. Data is protected within the European Economic Area at present, but we are aware of clauses that exist in terms and conditions of service and privacy policies that allow developers and providers of digital services to move data outside the EU should they wish to. This is the case with the **Locum’s Nest app** and similar apps that are widely used by trusts in England. There must be guarantees on the security of the data in storage and transmission and exchanges of data with third parties must be explained clearly. Use and protection of patient and staff data must be defined before procurement takes place. Users must then be informed about how their data is used before signing up to use services.

We therefore welcome the focus on user need within the vision document and believe that new systems will be enhanced greatly by regularly consulting with clinicians and staff, such as that already sporadically seen in general practice for many years now, on what changes would help them work better. Training needs to be tailored to the specific care setting to ensure that it is relevant and generates confidence in the clinicians and staff who will be using it. Currently, many systems are not sufficiently intuitive, which exacerbates health illiteracy and impedes the efficiency of information flow.

Procurement of IT systems has traditionally neglected involvement of clinically active staff and patients – the parties most likely to use and be affected by these systems. There is a perception that commissioners have tended to make IT decisions behind closed doors. This needs to be tackled to ensure that clinicians and patients are fully involved in the decision-making process.

**Recommendations:**

- Going forward, procurement must include a review and evidence-based evaluation through testing as to how the new technology will impact on users, workflow and interact with existing systems.
- Patient access to records, and their ability to interact with NHS IT systems, also needs to be intuitive and user friendly.
- Patients expect 'trust, clinical presence, empathy and communication' between doctors, clinicians and patients to remain a hallmark of NHS care irrespective of the introduction of any new technology.
- New systems will be enhanced greatly through regular consultation with clinicians and staff.
- All future IT related procurement and development to involve co-production with the staff that will use the technology when caring for their patients.
- Arrangements for data sharing between providers and settings must be backed up by robust information governance processes that are cognisant of, and protect, patient data in line with current laws and regulations.
- Patients and staff will need assurances that their personal data will be handled securely, fairly and appropriately. This must be defined before procurement of any digital services takes place.

## 5. Value for money will only be achieved through appropriate training, education and participation

### 5.1 Staff training in new technologies is vital to success

New discoveries and innovations have consistently transformed the way care is delivered in the NHS since its inception 70 years ago. The digital revolution has changed healthcare faster and more dramatically than at any other stage, yet digital healthcare is not a requirement of medical training or education for doctors who work in the NHS.

Digitalisation, artificial intelligence, e.g. **CDSS (clinical decision support systems)**, genomics, big data, robotics, virtual reality, tissue engineering and 3D printing are all already in use in the NHS, as well as countless other innovative tools. It is very likely that in the next 10 to 20 years the use of these tools will increase. However, the NHS is not currently adequately preparing its workforce for these changes.

Buying the best, or most suitable, technology is only helpful if it can be properly implemented. To ensure this happens, appropriate staff training is essential. Getting new technology into the system is only the first step. Over-stretched GP practices or hospital departments will not benefit from being sent expensive new devices if staff do not have time to learn to use them. If they are to commit to change, it must be evident to users that there will be clear benefits within a reasonable period, timely upgrades and suitable training and integration, with time built into medical training and job plans. All of this must be part of any procurement and implementation plan. We need only refer to the **2018 inquiry into the death of a patient at Freeman Hospital, Newcastle**, following the use of robotic assistance during heart surgery despite inadequate training or supervision, as a warning of the dangers of poorly implemented healthcare technology.

It is therefore welcome to see a commitment in the NHS LTP to 'education and training, which may be needed to maximise the opportunities of technology, artificial intelligence and genomics in the NHS' by 2019-2021.

#### Recommendation:

- Procurement of new technology or IT systems should include a requirement to factor in staff training, and the necessary associated resources for this, to ensure maximum impact for patients and best value for money.

## 5.2 Medical education, training and research need to respond to the growing use of technology in healthcare

'The new medicine as envisioned will require extensive education and training of the... workforce and the public, with cultivation of a cross-disciplinary approach that includes data scientists, computer scientists, engineers, bioinformaticians, in addition to the traditional mix of pharmacists, nurses and doctors' (2019 [Topol review](#)).

Throughout education and training, the doctors of the future must be exposed to emerging technology so that they are familiar with it and able to judge between suitable options when they start providing patient care. This is particularly important in an age where patients have greater access to information about their treatment, and treatments that are available or in development. Medical schools are well positioned to provide this exposure, which in the long term will significantly benefit doctors and patients. The training should be practical and "on the job", rather than stand-alone induction sessions, and the requirements may be different between generations of doctors.

Doctors also need help to acclimatise to the additional pressures that may come with more efficient technology and increased access to information. Information overload is a danger, and doctors are expected to make quicker decisions with less time to reflect on increasingly complex workloads, which, in time, will include multiple data flows and decision matrices sending various real time alerts.

### Recommendation:

- Digital health care must now become a requirement of medical training and education for existing and future doctors working in the NHS.

## 5.3 Digital transformation requires an open culture and appropriate engagement at all levels of the NHS

There will inevitably be tension between service provision and the need for staff and patients to be fully involved in the digital transformation process. If it is to be a successful process, however, this must be resolved. 'Expanding the [NHS Digital Academy Programme](#), with informatics leadership representation, e.g. Chief Clinical Information Officers and Chief Information Officers, on the board of every NHS organisation', as mentioned in the NHS LTP, will be another step towards a more open culture, as employers will have medical and clinical IT and innovation champions at the top of their organisations.

### Recommendation:

- It will be crucial that managers are enabled to allow staff the time and space they need for training and innovation, with this reflected in job plans going forward.
- Co-design and co-development of technologies with patients and other users is essential.

## 5.4 Doctors and other technology users are innovators

Voluntary innovation committees, such as the one set up by junior doctors in the North West of England Foundation School in Manchester, could be a driver in developing and promoting technological transformation. This committee developed an application that allows them to see patients' blood results and early warning scores on their work smartphones. Similarly, the BMA/RCGP Joint GP IT Committee is working with NHS England and others on the **NHS Innovation Accelerator, clinical entrepreneur training programme, digital health summer schools** and other programmes, which all provide opportunities to create bespoke applications and innovation.

The number of students and doctors learning how to code is on the increase, which has seen the emergence of the term "Doctorpreneurs", and these are the ideal people to help advance the NHS in terms of its technological capabilities. The **Academic Foundation Programme** may also be useful in developing more Doctorpreneurs to help increase innovation in the NHS.

### Recommendations:

- There needs to be a balance between encouraging a culture where innovation can flourish and appropriate evaluation and sharing of the outcomes.

## 6. Conclusion

High quality patient information and fully functioning technology can **increase productivity, improve patient care / experience** and transform the working lives of NHS staff by **reducing workload** and **improving morale**. As system users, **ongoing staff training and engagement around IT systems is vital**, especially when it comes to decision-making around the procurement of new hardware/software. **Interoperability, usability** and **continual improvement** must be central to all future NHS IT contracting. The primary goal must be to implement interoperable NHS IT systems that enable the exchange of essential patient information quickly and safely between care settings. Any new initiatives must include **new ring-fenced investment** to ensure appropriate resources are allocated **for digital transformation** and not diverted to more immediate concerns.

Developing **a set of national standards**, to which local decision processes must adhere, and the enforceability of those standards, will be crucial in delivering positive change. Equally, healthcare must only become more technology-driven and data-centred through **evidenced based evaluation**. Proper consideration as to how new systems will impact on workflow, care pathways and interact with existing systems at local levels will be essential. Healthcare scientists and the users, i.e. doctors, clinicians and patients, are best placed to help commissioners and developers co-produce efficient and effective systems and applications, and training will necessarily have to become part of medical and clinical education as well as job planning for every doctor and clinician.

**The introduction of more efficient time-saving systems**, including e-job planning and e-rostering for doctors and clinicians where implemented properly, has huge potential to **improve patient care, staff conditions** and **morale**, which means upgrading basic hardware and software to a recommended standard as soon as possible. **“In-house” IT support** should be a standard service for larger healthcare providers and federated models of care. IT arrangements must be backed up by **robust information governance processes** that **protect patient data**.

Furthermore, **intuitive and easily accessible PFTs** will **improve communication** between patients, doctors and clinicians, but these technologies must not exclude vulnerable people and unintentionally increase health inequalities. As part of an inclusive and collaborative process of digital transformation, **regular feedback should be sought from staff at a local and national level**.

In the meantime, there is a general feeling amongst the medical profession that investing in **the basic digital patient record**, and its **compatibility and interoperability across the whole NHS**, as well as the day to day functioning of basic hardware and software and electronic referral systems, **must be the immediate priorities**.

## Appendix A

### BMA policy on information, technology and innovation

#### Annual Representative Meeting Resolutions

- 135 Motion by CONFERENCE OF LMCS: That this meeting is concerned that new online GP services are targeting healthy, less complex patients, the funding for whom is partly used to subsidise care for more complex patients on the registered list and calls on the BMA to:
- demand a stop to the undermining of general practice by private companies who cherry pick the patients to whom they offer services;
  - demand that online consultation schemes do not become established unless they are prepared to provide a comprehensive package for all patients;
  - support general practice to explore innovative ways of providing health care;
  - demand the allocation of additional funds to NHS general practice to provide training, support and appropriate software and hardware to establish on line consultation services.

(2018)

- 137 That this meeting believes the BMA should have a strategy on monitoring the development and implementation of Artificial Intelligence (AI) in healthcare with particular reference to the impact on medical staffing and the wider ethical issues of such technology.

(2018)

- 813 That this meeting recognises that the use of IT can enhance patient safety and training for junior doctors and that there is currently wide variability between trusts (and their equivalents in the nations) regarding the use of IT in patient care. We call on the BMA to:
- i. recognise that electronic prescribing in the hospital setting improves patient safety over handwritten prescriptions;
  - ii. calls for all NHS secondary care providers to employ electronic prescribing software by 2020;
  - iii. recognise that electronic investigation requests in the hospital setting improves patient safety over handwritten requests;
  - iv. call for all NHS secondary care providers to employ electronic investigation requests by 2020.

(2015)

**LMC conference resolutions – England**

- 19 That conference insists that IT infrastructure must:
- i. provide proper function for clinical use by practices before introducing political wants such as wi-fi for patients;
  - ii. meet basic standards agreed with the GPC for connectivity and speed provide appropriate recompense to practices for failure;
  - iii. include the full reimbursement of practice costs incurred by system and provider changes including the purchase of systems and services for any proposed future working at scale environment;
  - iv. include a penalty clause in all future NHS IT contracts securing funding for any unforeseen workload required of general practice following a system failure.

(2018)

- 27 That conference supports the piloting of AI health systems but insists that, prior to further rollout:

- i. all systems need to be piloted and assessed against set national criteria;
- ii. the systems need to demonstrate a sustainable reduction in GP workload;
- iii. any system needs to fully integrate with GP clinical systems.

(2018)

## Appendix B

### IT failures in the NHS – Recent examples

#### Docman system incident (August 2018)

Poor training and suboptimal design of the system in **Docman** meant that **letters containing patient information were not automatically added to patients' electronic records**. Practices were not aware alerts sent to selected administrators needed to be monitored and acted upon. Affected practices had to go through electronic patient records to ensure that letters have been filed successfully and whether any steps in a patient's care pathway had been delayed or missed as a result. The BMA GPC (GP committee) has launched a survey for practices to complete so we can estimate the extent of the impact. We fear as many as 4000 practices in England were impacted.

#### TPP SystmOne allergy coding incident (August 2018)

GP practices using **SystmOne** (supplied by TPP) were notified that patient allergies/sensitivities were displayed incorrectly on the system. GP practices had to undertake hundreds of checks to provide reassurance to TPP that their error had not resulted in any patient harm. This has adversely impacted the SCR of affected patients, which, until manually rectified, now holds inaccurate data.

#### TPP SystmOne Electronic Repeat Dispensing Prescription incident (August 2018)

This is an issue involving the electronic repeat prescription template in SystmOne. Despite an initial fix, practices using SystmOne were notified that there was an ongoing clinical risk from the live electronic prescriptions, and from any medicines patients may have obtained previously and may be consuming. It is believed that the incident involves 10,053 prescriptions from 562 practices and 1479 nominated pharmacies. This incident added to the workload of GPs who had to determine the prescriptions that require discussion with pharmacies and those that require discussion with patients directly.

#### Incidences of Delayed Transmission of Hospital Letters

##### *Hertfordshire (September 2018)*

GPs in Hertfordshire were informed on 5th September 2018 that, due to a system error at East and North Herts NHS Trust, up to 25,000 documents in the system had been unsent. GPs estimate that it would take on average 20 minutes to review and action each document, e.g. update medical summary, update medication lists and check investigations. This would amount to approximately 8,000 hours, i.e. 25,000 unsent summaries multiplied by 20 minutes. There was some frustration that the Trust had been underplaying the volume and impact of the work. The story broke in **Huffington Post** and **Pulse**. More details about this incident can be found in this **letter**.

##### *London (May 2018)*

On 30<sup>th</sup> May, BHRUHT (Barking, Havering and Redbridge University Hospitals Trust) declared a major incident after discovering that a large number of letters, written in recent years, had never been issued from the EPRO (electronic patient-reported outcome) system – their digital solution for dictating documents. BHRUHT has confirmed that the problem was Trust-wide and affected all departments. These letters were, in the main, meant for GPs, but may also include letters to other consultants, hospitals and patients themselves. The total number of letters not sent out since 2014 was around 50,000. The trust confirmed that they had an action plan in place to address all letters that are on the EPRO system, not sent out since April 2018, and that these would be sent out immediately. At the time BHRUHT decided to undertake a phased approach in relation to older letters to identify any issues relating to patients and potential clinical harm.

##### *Calderdale (September 2017)*

On 25 September 2017, GPC became aware of a fourth incident affecting local GP practices in Calderdale and Huddersfield, following a system issue at Calderdale and Huddersfield Foundation Trust. This created a backlog of approximately 5,000 – 8,000 discharge and clinic letters that had not been sent correctly to GPs. This incident had locally been attributed to an upgrade to **Cerner's system**. The Trust resolved to send out the letters batched per patient in chronological order with a note clarifying that these were delayed letters. No resource was forthcoming for practices who were expected to complete this backlog.

*Suffolk (August 2017)*

In August 2017, GPC became aware of a further incident at West Suffolk Hospital about a fault in the electronic transmission of discharge summaries dating back to October 2016. There was no clear estimate of how many letters this involved, but an initial suggestion was that it related to 2,500 patients.

The LMC (local medical committee) were made aware of the issue in July. At that point it was asked by the CCG to ask practices to sift through and sort out the problems. The LMC raised concerns about this request due to the potential for harm having been caused and because practices did not have the capacity to deal with a problem that was so longstanding. Without further discussion with the LMC, the CCG then gave the go ahead to the hospital to send out thousands of discharge summaries, up to 5 or 6 per patient, to practices. On the ground, practices were receiving anything between 100-300 letters per practice. A token gesture of a one-off **£20** payment was made by the CCG to take on the additional workload, which the LMC challenged. The hospital has a wider catchment area beyond Suffolk, including parts of Cambridgeshire and Norfolk, so the potential for impact on General Practice was wider than Suffolk itself. Early reports in Norfolk suggested that at least 1 practice received more than 100 letters.

It later became known that the discharge summaries had medication errors but the hospital could not work out what they were. The hospital required GPs to review their practice records to help identify issues and said that only 3,900 patients were affected, not including those in Norfolk, although a further 300 were later identified. The hospital agreed to notify the coroner of all deceased patients who had been treated by it and who had medication errors in their discharge summaries. In September, a local solution was brokered by the LMC and agreed by all parties.

*Worcestershire (June 2017)*

In mid-June 2017, a practice received about 6 letters from the local hospital that were over a year old. The practice sent a breach notice to the CCG who acted quickly and investigated the issue. Worcestershire Acute Hospitals Trust found 2 email boxes with 25,000 unsent documents. The LMC was informed that staff were using their software wrongly and had assumed they were sent. Following local discussion, it was agreed that GPs were the only people who could review these and check if any actions were missed and if any harm could be identified. The LMC insisted the Trust must pay GPs to complete this work and this was eventually agreed. The LMC received payment per letter for the first batch of 4000 at £8.20 a letter as this was non-contractual work, i.e. checking and auditing a trust error with a clear understanding that any identified harm goes back to the trust as its responsibility. Further work found there were 11,000 unsent letters as the others were incomplete, templates or were blank letterheads.

The letters went back up to 4-5 years. The LMC was told there was concern that this software is widely used and that the same issue could happen elsewhere. The software being used by the trust is Bluespiers. It affected 64 practices within the county, as well as 5 further practices in other CCG areas. GPs reviewed and audited a high-risk group and so far have been made aware of 11 cases of harm being investigated by the Trust.

*Nottinghamshire (June 2017)*

In the week commencing 19<sup>th</sup> June 2017, NUHT (Nottingham University Hospitals Trust) became aware that a system upgrade that enabled all letters to be sent to practices electronically was not working as expected. In attempting to resolve the issue, the Trust sent out all the delayed letters with severe knock-on effects.

The Trust confirmed that approximately 32,619 items of electronic GP correspondence had not been delivered since 23<sup>rd</sup> April 2017. Due to a technical problem, the documents had been queuing for delivery and were not available for download by practices until Friday 23<sup>rd</sup> June when the problem was corrected. Consequently, some practices saw hundreds more documents than usual ready for download. In some cases, practices started receiving over 1,000 items of correspondence simultaneously.

The Trust resolved to write to all staff that produce GP correspondence to warn them of this incident. Feedback from practices suggested some of these documents were dated as far back as 2013. A *high percentage* were not duplicates and therefore took longer to process.

## Glossary of terms

1. **Academic Foundation Programme** – provides an opportunity for foundation doctors to develop research, teaching and leadership/management skills in addition to the competences outlined in the Foundation Programme Curriculum.
2. **API (application programming interface)** – a set of subroutine definitions, communication protocols and tools for building software.
3. **Artificial intelligence** – intelligence demonstrated by machines, in contrast to the intelligence displayed by humans.
4. **CDSS (clinical decision support systems)** – a system that is designed to provide doctors and clinicians with assistance in clinical decision-making tasks.
5. **Capita** - offers a range of customer management, administration and professional support services.
6. **Caring, supportive collaborative: a future vision for the NHS** – BMA project aiming to be an honest conversation with the medical profession about the sort of NHS doctors want to work in.
7. **Child Protection Information Sharing project** – helping health and social care staff to share information securely to better protect society's most vulnerable children.
8. **Clinical entrepreneur training programme** – designed to offer opportunities for junior doctors and wider health professionals to develop their entrepreneurial aspirations during their clinical training period.
9. **Controlled drugs** – some prescription medicines are controlled under the **Misuse of Drugs legislation** (and subsequent amendments). These medicines are called controlled medicines or controlled drugs.
10. **Diabetes Prevention Programme** – identifies those at high risk and refers them onto a behaviour change programme. It is delivered by NHS England, Public Health England and Diabetes UK.
11. **Digital-first primary care** – refers to delivery models through which a patient can receive the advice and treatment they need from their home or place of work via online symptom checking and remote consultation.
12. **Digital health summer schools** – best practice and networking events for NHS digital leaders.
13. **e-Referral Service** – combines electronic booking with a choice of place, date and time for first hospital or clinic appointments. Patients can choose their initial hospital or clinic appointment, book it in the GP surgery at the point of referral, or later at home on the phone or online.
14. **EHR (electronic health record)** – the same as a PHR (see below) – digital health tools that allow patients to do specific tasks. This includes to view their medical record, book appointments and upload their own health information.
15. **EMR (electronic medical record)** – the same as a PHR (see below) – digital health tools that allow patients to do specific tasks. This includes to view their medical record, book appointments and upload their own health information.
16. **ESR (electronic staff record)** – supports the delivery of national workforce policy and strategy. It provides NHS organisations with a range of tools that facilitate effective workforce management and planning thereby enabling improved quality, improved efficiency and improved patient safety.
17. **Electronic job planning systems** – digital systems used to record consultant job plans.
18. **Electronic Prescription Service (EPS)** – sends electronic prescriptions from GP surgeries to pharmacies. Eventually EPS will remove the need for most paper prescriptions.
19. **GP federation** – based on a group of practices working together within their local area, in some sort of collective legal or organisational entity.
20. **GP2GP** – allows patients' electronic health records to be transferred directly, securely and quickly between their old and new practices when they change GPs. This improves patient care by making full and detailed medical records available to practices for a new patient's first and subsequent consultations.

21. **GPSoC (GP Systems of Choice)** – GP practices and **organisations allowed to use GPSoC** can choose systems that best suit their needs from a range of four principal system suppliers. These are **TPP SystemOne, EMIS Web, InPS Vision** and **Microtest Evolution**. GPSoC is a contractual framework to supply IT systems and services to GP practices and associated organisations in England. The framework ended on 31st March 2018, when a continuity agreement was agreed, to ensure that the essential core services from GPSoC remain available until a replacement GP IT Framework is in place. The GPSoC Continuity period may run until 31st December 2019.
22. **Global Digital Exemplars** – an internationally recognised NHS provider delivering improvements in the quality of care through the world-class use of digital technologies and information.
23. **Google DeepMind** – artificial intelligence research and its application for positive impact.
24. **Interoperability** – the ability of computer systems or software to exchange and make use of information.
25. **Locum’s Nest** – an application that connects doctors to locum work in healthcare organisations.
26. **MESH (Message Exchange for Social Care and Health)** – the main messaging service used across health and social care, which allows health and care organisations to communicate secure.
27. **NHS App** – a simple and secure application for people to access a range of NHS services on their smartphone, tablet or laptop.
28. **NHS Digital Academy Programme** – a virtual organisation set up to develop a new generation of digital leaders that drive the information and technology transformation of the NHS.
29. **NHS Digital draft framework document** – outlines the key standards for clinical safety, the use of data, interoperability and design interactions.
30. **NHS Innovation Accelerator** – accelerates uptake of high-impact innovations for patient, population and NHS staff benefit. It also provides real-time practical insights to inform national strategy.
31. **NMAS (National Message Assurance Services)** – a fully automated service that provides messaging checking, laboratory implementation testing, clinical governance message checking and general practice test requests and response analysis.
32. **ODS (organisation data service)** – responsible for publishing codes that identify organisations and individuals across health and social care.
33. **PDS (personal demographics service)** – the national electronic database of NHS patient details, such as name, address, date of birth and NHS Number. This is known as demographic information.
34. **PFTs (patient facing technologies)** – software, and in some cases hardware, used by patients, e.g. apps to access patient health record, book appointments, upload information about their own health etc.
35. **PHR (personal health record)** – digital health tools that allow patients to do specific tasks. This includes to view their medical record, book appointments and upload their own health information.
36. **Personal child health record (PCHR)** – shortly before or after a baby is born, the parent is / parents are given a personal child health record. This usually has a red cover and is known as the “red book”.
37. **Primary care network** – consists of a grouping of GP practices within a coherent geographical area, typically covering a population of 30-50,000 patients. They enable engagement of a broader range of clinicians and non-clinicians within the extended primary care team across multiple practices.
38. **Primary Care Support England programme** – NHS England has a contract with Primary Care Support England to provide seven services as a data processor.
39. **Summary Care Record** – an electronic record of important patient information, created from GP medical records. They can be seen and used by authorised staff in other areas of the health and care system involved in the patient’s direct care.
40. **WannaCry** – a May 2017 worldwide cyberattack by the WannaCry ransomware cryptoworm, which targeted computers running the Microsoft Windows operating system by encrypting data and demanding ransom payments in the Bitcoin cryptocurrency.

**British Medical Association**  
BMA House, Tavistock Square,  
London WC1H 9JP  
[bma.org.uk](http://bma.org.uk)

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