National Audit Office

DEPARTMENT OF HEALTH

The National Programme for IT in the NHS

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DEPARTMENT OF HEALTH

The National Programme for IT in the NHS

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15 June 2006

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CONTENTS

SUMMARY 1

PART 1

The purpose of the Programme, what it is and what it has achieved 8

The purpose of the Programme 9

What the Programme is and how it is organised 10

What the Programme has achieved 13

PART 2

Preparing to deliver the systems 28

The Programme has Ministerial support 29

Taking account of earlier experiences, the Department decided to procure and manage the Programme centrally 29

NHS Connecting for Health has sought to ensure the systems meet users' needs 30

The Care Record Guarantee sets out the standards required for confidentiality of patient records and consent to access and share records 31

PART 3

Procuring and delivering the systems 34

NHS Connecting for Health ensured there was vigorous competition for the contracts, and maintained this competition after the contracts were awarded 35

The contracts include strong incentives to deliver – both carrot and stick 36

NHS Connecting for Health has taken an intrusive but supportive approach to the management of its supplies 37

A wider choice of GP systems is planned for GPs 40

PART 4

Preparing to use the systems in the NHS 42

The Department was aware that engagement of the wider NHS needed to be timed effectively alongside the procurement and implementation phases 43

National leadership of parts of the Programme has changed a number of times 44

NHS Connecting for Health has taken steps to inform future users and win their support 44

There is support for what the Programme is seeking to achieve 45

The NHS has more work to do on engagement 45

The Department is strengthening its systems for monitoring and managing performance to help deliver the Programme 49

APPENDICES

1 Methodology 50

2 Lessons learned from the procurement and management of the National Programme which may be of benefit to other departments 53

3 Matters raised in correspondence with the National Audit Office 54

4 Extract from *Delivering 21st Century IT Support for the NHS* 56

Photographs courtesy of NHS Connecting for Health

SUMMARY

1 The National Health Service (the NHS) depends on the successful handling of vast quantities of information to function safely and effectively. The National Programme for Information Technology in the NHS (the Programme) is a ten year programme which presents an unprecedented opportunity to use Information Technology (IT) to reform the way the NHS in England uses information, and hence to improve services and the quality of patient care. The core of the Programme will be the NHS Care Records Service, which will make relevant parts of a patient's clinical record available to whoever needs it to care for the patient. The Programme also includes many other elements, including X-rays accessible by computer, electronic transmission of prescriptions, and electronic booking of first outpatient appointments.

2 The Programme was launched by Ministers in June 2002. Following the announcement of the Programme, the Department of Health (the Department) established a unit to procure and deliver the IT systems, headed since October 2002 by its first Director General for NHS IT. In April 2005 this unit became an agency of the Department called NHS Connecting for Health.[1]

3 In the past, individual NHS organisations procuring and maintaining their own IT systems and the procurement and development of IT within the NHS has been haphazard. The Department did not consider this approach to have been successful, and one of the aims of the Programme has been to provide strong central direction of IT development, and increase the rate of take up of advanced IT. The Programme is being delivered mainly through contracts negotiated by NHS Connecting for Health with IT service suppliers.[2] Once systems have been developed by the suppliers, further action is needed to bring them into use, such as integrating with existing IT systems and configuring them to meet local circumstances, training staff to use them, and adapting ways of working to make the best of the solutions. Four Local Service Providers are primarily responsible for organising this work, but much work is needed by local NHS organisations – Strategic Health Authorities, NHS Trusts and other providers working for the NHS, such as General Practitioners (GPs) and Pharmacists.

4 The Programme's scope, vision and complexity is wider and more extensive than any ongoing or planned healthcare IT programme in the world, and it represents the largest single IT investment in the UK to date. If successful, it will deliver important financial, patient safety and service benefits. The main implementation phase of the Programme and the realisation of benefits is mainly a matter for the future and it will therefore be some time before it is possible fully to assess the value for money of the Programme, as this will depend on the progress made in developing and using the systems it is intended to provide. It is therefore important for taxpayers and patients that this investment pays off, and for the Programme to be well managed and open to public scrutiny. Accordingly, we examined the progress being made in delivering the systems against the original plans and the costs of the Programme (Part 1); the steps taken by the Department, NHS Connecting for Health and the NHS to deliver the Programme (Part 2); how the IT systems have been procured (Part 3); and how the NHS is preparing to use the systems delivered (Part 4). We have examined progress to date in these areas and may return to carry out a further examination at a later date should this appear necessary. Appendix 1 sets out our methodology.

1 In this report, we have used the term NHS Connecting for Health to represent both the current NHS Connecting for Health agency, and the former National Programme for IT unit.
2 The four principal suppliers are BT, Accenture, Fujitsu and CSC, supported by numerous others.

5 The main projects making up the Programme are listed in Figure 3, which also shows the estimated timetable and cost of each. On the basis of our examination of the Programme, we conclude that:

a The Programme has strong ministerial and senior management support and commitment. The Department and NHS Connecting for Health have put in place best practice arrangements that will support the IT elements of the Programme and the Department has established best practice structures to deliver the Programme. The implementation of the Programme does not feature in current Department of Health Public Service Agreement targets nor supporting targets, but it is a necessary enabler for a number of Ministerial commitments.

b The Programme has the potential to generate substantial benefits for patients and the NHS. The main aim is to improve services rather than to reduce costs. The Department has put a financial value on benefits where it could, but as the main aim is to improve services rather than reduce costs, it was not possible to do so in all cases. As a consequence, it was not demonstrated that the financial value of the benefits exceeds the cost of the Programme. The Treasury's guidance[3] states that benefits should be valued when possible, but recognises that sometimes they cannot be. In this case, the Treasury has accepted the Department's approach and has approved all expenditure so far made and planned.

c Considerable efforts were made to specify and describe the high level benefits that the different projects within the Programme are intended to deliver, for example in the agency's National Programme Implementation Guide,[4] and documentation setting out the intended timeline and milestones for delivery of benefits.[5] In addition, savings are expected, for example by using NHS Connecting for Health's buying power to drive down the prices paid for IT goods and services and in staff time saved through using the Programme's services, and some of these savings are planned to contribute to the Department's Gershon economies. NHS Connecting for Health has negotiated the renewal of the Department's NHS - wide licence for Microsoft desktop products, securing the lowest prices in the world. NHS Connecting for Health estimates that this and similar agreements with other suppliers will save £860 million.

d The procurement of the contracts centrally, rather than through local NHS units as had been the practice in the past, is independently estimated, in a report commissioned by NHS Connecting for Health, to have saved £4.5 billion in terms of the prices paid for goods and services.

e NHS Connecting for Health secured vigorous competitions for the IT contracts, maintaining competitive tension by negotiating contracts with at least two final bidders before selecting a winner and dispensing with the preferred bidder stage. Through the use of standard financial model templates NHS Connecting for Health made like for like comparisons of bids which, together with the vigorous competition, enabled it to achieve significant price reductions from the eight prime contractors, the difference between their initial and final bids totalling £6.8 billion.

f Procurement of the contracts was completed commendably quickly – all of the contracts were procured in under a year between February 2003 and February 2004, and most were concluded within ten months. Speed can help to contain the costs of procurement and this experience compares to an average of 27 months for the procurement of a single major PFI project. The Office of Government Commerce considered there to be many good features in the procurement process for wider application to government IT procurement. These included elements of contract innovation, which it has built on to develop its good practice guidance.

g NHS Connecting for Health bought the systems at a fixed competitive price transferring financial and delivery risk to the suppliers, and it does not pay suppliers until services are proven to be delivered and working. So, although there have been delays in delivering the NHS Care Records Service, the suppliers have borne the cost of overcoming difficulties in delivering the software and not the taxpayer. Strong incentives for the suppliers to deliver to timetable and mechanisms such as tight change control procedures are in place with the aim of providing continued value for money over the life of the Programme. The speed of the negotiations and the inclusion of a sound balance of incentives and penalties within the contracts have put NHS Connecting for Health in a strong position in its relationships with suppliers, and one that is stronger than previous government procurement practice.

3 The Green Book. *Appraisal and Evaluation in Central Government*. HM Treasury, 2004.
4 Accessible at http://www.connectingforhealth.nhs.uk/implementation/.
5 http://www.connectingforhealth.nhs.uk/all_images_and_docs/benefits_timeline.pdf

h NHS Connecting for Health has taken positive action to ensure the contractors are managing their tasks well. It has taken an intrusive but supportive approach to the management of its suppliers. Where it has identified problems, NHS Connecting for Health has taken action to address deficiencies in suppliers' performance.

i There has been continuity in the leadership of the central IT elements of the Programme, the Director General for IT and the Chief Operating Officer have been in post continuously since October 2002 and September 2003 respectively. But national leadership of engagement with NHS organisations and staff in implementing and making best use of the systems has changed a number of times and resource constraints limited the scale of early engagement efforts. Responsibility for this work was given a higher profile with the appointment of National Clinical Leads in late 2004 and the introduction of stronger management arrangements during 2005.

j The Department and NHS Connecting for Health decided to conclude the bulk of procurement activities before focussing on communicating with and engaging NHS staff. Wider engagement and mobilisation of the NHS was not started until NHS Connecting for Health judged that procurement had reached a sufficient stage of maturity to be able to communicate its outcome in a meaningful and efficient way. It was concerned that to have done so earlier might have raised expectations which were either speculative or may not have been met and there were also resourcing constraints.

k There is support amongst NHS staff for what the Programme is seeking to achieve, but also significant concerns amongst some staff: that the Programme is moving slower than expected, that clarity is lacking as to when systems will be delivered and what they will do. Particular concerns were raised by GPs that they would be forced to replace their existing IT systems. In response to this, NHS Connecting for Health is finalising an agreement with suppliers intended to make it much easier for GPs to stay with their existing suppliers. Conversely, other systems have been well received by users including GPs.

l Some elements of the Programme had already been delivered, including some elements added to the Programme and outside its original brief. Achievements to early April 2006 included:

- The Quality Management and Analysis System (QMAS) to support the new contract for General Practitioners from April 2004 was delivered on time and budget and is being used by all GPs.
- A new NHS wide directory with half a million entries and an email system (NHSmail) with 80,000 active users and 168,000 staff registered to use the system.
- The first 14,130 connections (compared to a target for March 2006 of 12,000) of the 18,000 eventually planned for the new NHS secure communications network, the New National Network (N3).
- Initial milestones for new systems to deliver Ministerial targets for Choice and the Electronic Prescribing Service, and deployments of X-ray and other diagnostic images systems (Picture Archiving and Communications Systems – PACS), with PACS systems installed at 30 Trusts out of the planned final total of 130.
- The Choose and Book system available at all relevant locations, and being used for 12 per cent of bookings. A total of 261,983 Choose and Book bookings had been made to 3 April.
- The Electronic Prescribing Service available at around 15 per cent of GP surgeries and pharmacies, and used to issue a total of 726,843 prescriptions by 3 April.
- A total of 9,600 initial deployments of software of various types, the registration of 208,990 staff for issue with Smartcards for secure access and 45,000 NHS staff accessing the NHS Care Record Spine every day.
- Availability of the Programme's services has for the most part exceeded the contractual targets.

m However, achievement of other milestones has been deferred:

- The National Data Spine first went live on time, in June 2004, but achievement of later milestones for building up its functionality has been delayed by up to ten months.
- Local Service Providers' delivery of the first phases of the NHS Care Records Service and the advanced integrated IT systems that are central to the long-term vision for the Programme will now be later than originally planned. Deployment of the national clinical record is now planned in pilot form from late 2006, compared to the original plan of December 2004, and in its full form from late 2007. In the interim, Local Service Providers have provided Patient Administration Systems; these are linked to the Spine for security, single sign-on, Choose and Book, Personal Demographic Services (PDS), Electronic Prescribing Service and together with other Programme systems, to support NHS organisations in urgent need of new or replacement IT systems. However, the plan remains for the entire implementation to be completed by 2010 in accordance with originally contracted timescales.
- While the software for Choose and Book was delivered on time, the take up of the system to support patient choice has been slower than initially planned as a result, amongst other things, of an extension of the scope of the system to support the introduction of patient choice and the time needed by suppliers of existing IT systems to make their systems compliant. Deployment of the Electronic Prescribing Service and PACS (which was added to the Programme in September 2004) has also started more slowly than initially planned, but NHS Connecting for Health expects Ministerial targets for the later stages of deployment to be achieved.

n In May 2005 the Department published the NHS Care Record Guarantee setting out the principles it intends to apply to protect the confidentiality of electronic patient records. Work continues on a number of important practical issues, including sharing information with non-NHS bodies, such as local authority social services, and the working of 'sealed envelopes' intended to allow patients to limit the sharing of information about themselves.

o The full gross cost of the Programme includes the nationally agreed contracts, including approved additions, other central expenditure and the local implementation costs. Whilst some of this expenditure is directly managed by NHS Connecting for Health, management of local IT expenditure is a matter for the local NHS bodies concerned. NHS Connecting for Health does not seek to maintain a detailed estimate of overall expenditure on the Programme but makes broad projections of expenditure. Our analysis of these projections indicated that provision had been made for total spending on the Programme (at a gross level, i.e. without deduction for possible savings or benefits) of £12.4 billion (at 2004-5 prices)[6] over the ten year life of the main contracts, to 2013-14. This is not a budget but an amalgamation of fixed price contracts, extrapolation of costs beyond the contract periods and provisional forecasts of other costs.

p The elements comprising this total are:

- **£6.2 billion** by NHS Connecting for Health on the fixed price contracts let in 2003 and 2004, in line with the announcements made at the time of contract awards. These contracts are being managed within this total.
- **£382 million** contracted expenditure on new projects added to the original scope of the Programme, predominantly PACS, where the cost of providing central data stores is £245 million.
- **£239 million** on additional services to be purchased beyond the scope of the original core contracts (a mixture of contracted expenditure and estimated costs).

6 Including capital investment but excluding depreciation.

- **£1.9 billion** in other central expenditure, primarily by NHS Connecting for Health on centrally managed projects and services within the Programme and running NHS Connecting for Health, based on current estimates of likely expenditure. NHS Connecting for Health told us that on the current scope of the Programme, they expect that actual expenditure will be less than this amount, because once the initial stages of system development and deployment have passed, NHS Connecting for Health's task will diminish and its continued existence as a separate organisation would need review in accordance with the principles of the Department's 2004 review of its Arm's Length Bodies. NHS Connecting for Health told us that it expected the maximum outturn for the management of the Programme to be less than £1.5 billion over the ten-year term.
- **£337 million** on the estimated cost of replacing core contracts that expire before the end of the ten year period to 2013-14. This is a notional allowance to recognise that expenditure will be required to continue these services, but it is too early to make a more precise estimate of their likely cost.
- **£3.4 billion** in expenditure by local NHS organisations, for example on local IT and training and ensuring compliance of local systems with Programme delivered systems. It is not committed expenditure but is based mainly on the forecasts of expenditure made in the investment appraisals carried out at the time of the award of the main LSP contracts in late 2003 and early 2004. Approval and management of this expenditure is a matter for local management.

q Up to the end of March 2006, actual expenditure on the contracts let in 2003 and 2004 has been lower than planned, with £654 million (estimated outturn) spent against expected expenditure of £1,448 million, reflecting the slower than planned delivery of some systems and the successful operation of contractual provisions that suppliers will only be paid once services are proven to be delivered and working.

r The Programme is also expected to release IT funds within the local NHS, for example when the deployment of new systems paid for by NHS Connecting for Health replaces systems that local NHS bodies had previously been paying for. NHS Connecting for Health does not monitor systematically the actual impact the Programme is having on local IT spending or the extent to which the initial estimates of its impact are being borne out in practice. However, it believes that experience of individual deployments so far has confirmed the scope for local savings on a substantial scale. NHS Connecting for Health also believes that the patient safety benefits expected from the Programme could be worth many billions over ten years.

6 On 30 May 2006, the Minister of State for Reform (Lord Warner of Brockley) who is responsible for the Programme, was reported in the media as having said that the full cost of the Programme was likely to be nearer £20 billion. NHS Connecting for Health has told us that he was not referring solely to the costs of the Programme but to the total expenditure on NHS IT over ten years.

CONCLUSIONS AND RECOMMENDATIONS

7 The Department and NHS Connecting for Health have made substantial progress with the Programme. They have established management systems and structures to match the scale of the challenge. They successfully placed contracts very quickly, after securing large reductions in prices from bidders, and including contract terms that include important safeguards to secure value for money for the taxpayer. Deployments of operational systems have begun and NHS Connecting for Health has taken on, and in some cases already delivered, several additional tasks which were not within the original brief for the Programme. NHS Connecting for Health has adopted many of the key lessons of prior public IT failures. The notable progress and tight control of the central aspects of the programme are to be commended.

8 Successful implementation of the Programme nevertheless continues to present significant challenges for the Department, NHS Connecting for Health and the NHS, especially in three key areas:

- Ensuring that the IT suppliers continue to deliver systems that meet the needs of the NHS, and to agreed timescales without further slippage.
- Ensuring that NHS organisations can and do fully play their part in implementing the Programme's systems.
- Winning the support of NHS staff and the public in making the best use of the systems to improve services.

9 In going forward, we make the following recommendations:

a The Department of Health and NHS Connecting for Health should provide greater clarity to organisations and staff in the NHS as to when the different elements of the Programme will be delivered. NHS Connecting for Health should ensure that it has a robust engineering-based timetable for delivery, which it is confident its suppliers are capable of achieving.

b NHS organisations should communicate to members of staff how such a timetable will affect them, and forewarn them of the challenges facing the Programme, so that the setbacks and changes of priority inevitable with a programme of this size do not cause a loss of confidence.

c NHS Connecting for Health should continue its strong management of suppliers' performance, including its imposition of contractual penalties where needed to encourage suppliers to deliver on their commitments, including if necessary termination and replacement of contractors. Whilst some adjustment of suppliers' milestones for the delivery of functionality may be a necessary pragmatic response to suppliers' difficulties in delivering, it should not allow this to compromise the eventual achievement of the vision of the fully integrated care record service that was the objective of the Programme at its inception.

d The Department and the NHS should prepare an annual published statement quantifying the benefits delivered by the Programme. The main justification of the Programme is to improve services to patients, rather than merely to make economies in providing pre-existing standards of service. Quantification of benefits, including financial benefits and quality improvements delivered, set against the costs incurred, will help to demonstrate the actual benefits achieved across the Programme and improve the transparency of value for money being achieved through its implementation. It will also highlight where efficiency improvements are being made.

e The Department, NHS Connecting for Health and the NHS should commission a study to measure the impact of the Programme on local NHS IT expenditure – both costs and savings – where systems are now being deployed, and, together with its quantification of financial and non-financial benefits (recommendation (d)), use this to provide an up to date assessment of the overall investment case for the Programme.

f The Department and the NHS should continue to evaluate the experience of NHS organisations that have recently introduced IT systems similar to those to be provided by the Programme, to use their experience to help identify and quantify the service and efficiency improvements that such systems can deliver.

g The Department, NHS organisations and NHS Connecting for Health should put in place training and development programmes to strengthen capability, including project management and IT skills available to the wider NHS, continuing its work with the Office of Government Commerce. The shortage of such skills is an immediate risk to the timely implementation of the Programme, and strengthening capacity in these areas will be a long-term asset for the NHS.

h The Department and NHS Connecting for Health should build on the early success of the National Clinical Leads by designating further Leads using individuals of similar calibre, to help build momentum for the Programme as it is deployed across the NHS.

10 We also believe that other organisations could learn lessons from NHS Connecting for Health's experience so far, in particular the advantages that were gained through the swift procurement exercise, the incentives and penalties included in the contracts and the robust management of the suppliers. These lessons are set out in Appendix 2.

PART ONE

The purpose of the Programme, what it is and what it has achieved

The purpose of the Programme

1.1 The huge volume of contacts between the NHS and patients at numerous NHS sites, generates records – for example to communicate information such as results of medical tests – which are usually kept on paper. Paper takes up space, is difficult to share between those responsible for a patient's care, is not secure, and is easily lost. This creates costs for the NHS and can cause delays, inconvenience and incorrect care and treatment of patients, which may lead to needless loss of life.

The NHS has huge volumes of contacts with patients

In a typical week:

- six million people will visit their GP;
- 360,000 people will have an x-ray;
- 250,000 people will attend first NHS hospital outpatient appointments; and
- pharmacists will dispense some 13.7 million items on NHS prescriptions.

Source: Department of Health. Chief Executive's report to the NHS: Statistical supplement, May and September 2005

1.2 In the past, procurement and development of Information Technology (IT) within the NHS has been haphazard, with individual NHS organisations procuring and maintaining their own IT systems, leading to thousands of different IT systems and configurations being in use in the NHS. These are provided by hundreds of different suppliers, with differing levels of functionality in use across the country. The large number of different and incompatible systems has meant that the NHS's IT systems infrastructures have been built up to create silos of information, which, with few exceptions, are not shared or shareable even when, for example, different GP practices use the same GP system. As a result, the information required for safe and efficient care may be absent. This directly impacts on clinicians' ability to deliver holistic and safe care.

1.3 This approach is an obstacle to effective communication between the many healthcare professionals caring for the patient. It is also a danger to patient safety. For example, the 2000 report *An organisation with a memory*[7] found that adverse events harming patients occur in around ten per cent of admissions to NHS hospitals, some 850,000 a year. In their 2005 report, *Building a memory,*[8] the National Patient Safety Agency found that the most common type of patient safety incident reported in General Practices was due to poor documentation. Other impacts of a lack of adequate IT include the unnecessary repetition of x-rays, loss of pathology test results, and problems of defending litigation claims because of incomplete or missing records (approximately £430 million is paid out each year in settlement of clinical negligence claims).[9]

1.4 The National Programme for Information Technology in the NHS (the Programme) presents an unprecedented opportunity to use IT to reform the way the NHS in England uses information, and hence to improve health services and the quality of care delivered to patients. In scope and scale, it is a world's first, and at the forefront of international health IT. It is inevitable that the implementation of a Programme of this scale and complexity will carry risks. The Programme is intended to enable the NHS to become more effective in treating patients. It seeks to do so through, for example, ensuring that accurate patient records are available at all times; transmitting information rapidly between different parts of the NHS; helping to calculate drug dosages and accurately transmitting prescriptions to pharmacies, and providing expert systems to help inexperienced staff. The Programme is also intended to benefit NHS staff and help make the NHS more efficient, for example by reducing the time spent repeatedly taking patients' medical histories and demographic details and reducing reliance on patients' and carers' memories.

7 *An organisation with a memory.* Report of an expert group on learning from adverse events in the NHS chaired by the Chief Medical Officer. Department of Health, June 2000.
8 *Building a memory* Part 2, National Patient Safety Agency, July 2005.
9 *A Safer Place for Patients: Learning to improve patient safety*. National Audit Office, HC 456, 2005-06.

What the Programme is and how it is organised

1.5 The Programme is made up of a combination of national projects providing services for the whole of England, and of Local Service Providers responsible for delivering the services in their respective part of the country. Figure 3 sets out the main projects and services to be delivered. Four principal suppliers, BT, Accenture, Fujitsu and CSC, are supported by numerous other contractors. The Service Providers act as prime contractors, who have to decide how best to deliver the service specified by NHS Connecting for Health, assembling and integrating software and other products from a range of sources to provide three main types of service:

- A New National Network (N3), an enterprise class Wide Area Network which integrates enterprise class broadband DSL, fibre-based Ethernet and other data network services as needed to provide a seamless, efficient and cost effective service linking NHS sites.
- Services to local NHS bodies. There are four Local Service Providers, serving five Clusters of NHS organisations **(Figure 1)**, one supplier (Accenture) having won the contracts for two Clusters.
- National systems, such as electronic transmission of prescriptions, developed by a National Application Service Provider and accessible through the systems of the Local Service Providers.

1.6 The approach of delivering the Programme in five geographical Clusters sought to provide durability to the organisational arrangements by making the five Clusters coterminous with either one or two Government Offices. The approach reduces the size of individual contracts, increasing the number of potential suppliers capable of handling the size of contracts and implementation effort, thereby increasing competition for the contracts. Going forward, it also reduces the impact of any single supplier performing poorly, offers NHS Connecting for Health the opportunity to bring in other suppliers if any one supplier fails to deliver and helps avoid the NHS becoming too dependent on a single incumbent supplier (the Committee of Public Accounts has previously highlighted the risk of dependency on a single supplier in its reports).[10]

1.7 One of the generic risks to projects being successfully delivered is the addition of new or expanded projects to the original scope, known as "scope creep". Accordingly, in October 2004, the Department's Management Board decided that no further extensions to the Programme and NHS Connecting for Health's commitments should take place without the Management Board's agreement. There have been some changes to the scope of the Programme since it was established in October 2002. The Quality Management Analysis System (QMAS) to support the General Medical Services Contract, NHSmail (e-mail and Directory Services), PACS (Picture Archiving Communications Systems), bowel cancer screening and Payment by Results were added to the Programme. NHS Connecting for Health has also supported some other projects outside the Programme, such as the procurement of ambulance radios. There have also been increases to the scope of some of the projects being delivered within the Programme, for example the choice element of Choose and Book and the nomination of dispensing location and patient medication record within the Electronic Prescription Service. However, the potential impact of the additional work was examined carefully and a number of other projects, such as dentistry, were either deferred or refused.

What's involved in a deployment:

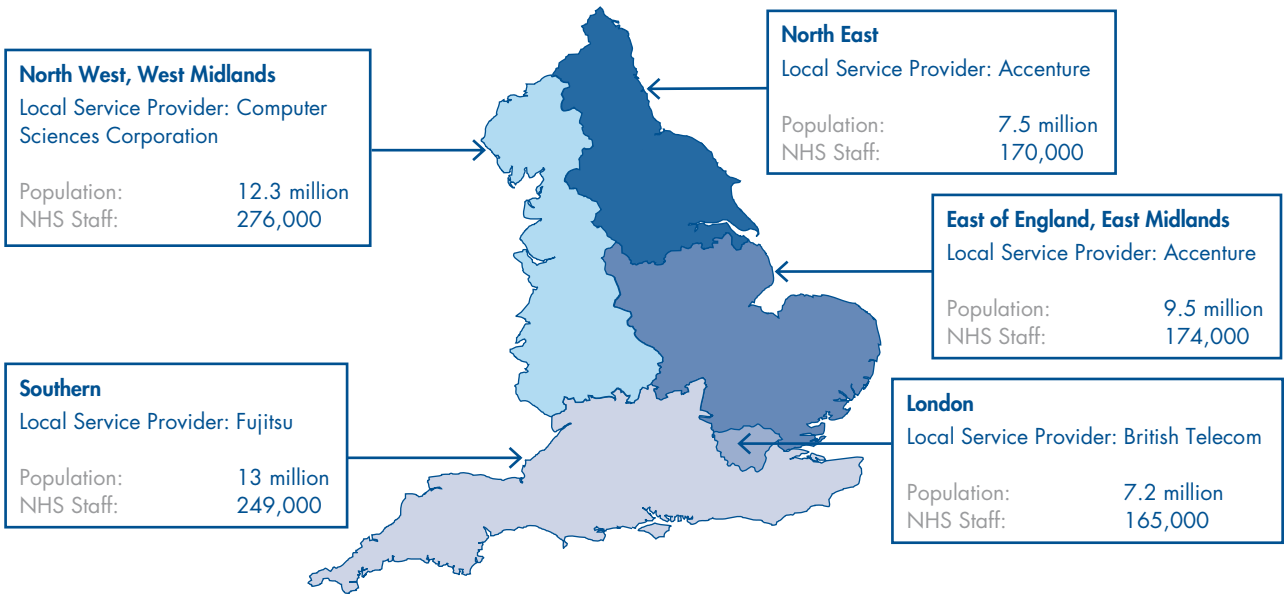
Installing a new Patient Administration System at the University Hospitals of Morecambe Bay NHS Trust covered:

- Deployed at three hospital sites, including Accident and Emergency; the control on the wards of admissions, discharges and transfers; support for outpatient administration;
- 5,000 staff;
- 2,000 computer users who have been trained;
- 2,800 Smartcards issued;
- 400–500 concurrent users;
- 511,000 patient records migrated;
- 1.68 million outpatient appointments migrated (including 60,000 future appointments);
- 250,000 inpatient spells;
- 600,000 patient contacts; and
- Completed conversion of all base data over one weekend.

Source: NHS Connecting for Health

10 For example, Inland Revenue/EDS Strategic Partnership: Award of New Work. *Committee of Public Accounts, 28th Report 1999-00*, HC 431, July 2000; The Contract to Develop and Update the Replacement National Insurance Recording System. *Committee of Public Accounts, 46th Report, 1997-98*, HC 472, June 1998.

1 Systems and services will be delivered to the local NHS through five Clusters



Source: NHS Connecting for Health

NOTE
The five clusters will provide services to 50 million patients.

1.8 The scope, vision, scale and complexity of the Programme is wider and more extensive than any ongoing or planned healthcare IT development programme in the world. Whilst other countries are seeking to adopt elements of the services within the National Programme, such as electronic patient records, these are not being introduced on a country-wide basis. In developing the Spine (which will hold summary information about every patient's care and support the transmission of information between other systems), the Programme is developing a system not being attempted elsewhere on this scale. The nature of the NHS with its scale, specialisms and fragmentation of existing IT systems also makes delivery and implementation at each NHS site more complex than other IT implementations.

The Programme is being delivered in phases

1.9 The Committee of Public Accounts, in its report *Improving the delivery of Government IT projects*,[11] recommended adoption of an incremental, as opposed to "big bang", approach to IT projects. To reduce risks, the Programme is following an incremental approach:

- Local Service Providers will make systems available to NHS bodies in a series of manageable releases, initially providing only some of the functions required, and building to completion of the full national system by 2010.
- NHS bodies deploy systems through many small local projects to support their business and organisational requirements as convenient to them, once the Local Service Provider has a proven solution available to deploy.
- Where NHS bodies' existing systems have a high degree of functionality, then provided those systems are made compliant with the Spine, Choose and Book and Electronic Prescriptions, they need not be replaced with Programme systems until the latter achieve equivalent or greater functionality, or greater integration across local health communities. This system integration is highly complex and is taking longer than suppliers initially planned. The Programme has established a National Integration Centre to industrialise and de-risk this process and to provide accreditation of compliant systems.

11 *Committee of Public Accounts – Improving the delivery of Government IT projects First Report 1999-2000,* (HC 65).

1.10 A broad timetable for the Programme was set out by Ministers in *Delivering 21st Century IT support for the NHS*, published in 2002[12] an extract of which is in Appendix 4. A more detailed timetable was developed to form the basis for procurement. NHS Connecting for Health's initial plan was for the NHS National Care Records Service to be implemented in three phases sub-divided into five elements and to be delivered by the dates shown in **Figure 2**. As additional projects were added to the Programme some changes have been made.

1.11 The contracts with the suppliers reflected these dates in Phase 1. For Phases 2 and 3 dates were not set in the contracts as at the time they were agreed; there was no engineering basis for their determination. The expectation was that this would be done when work on Phase 1 was more advanced. In response to changes in the scope of the Programme following the signature of the main contracts (paragraph 1.7), difficulties by some suppliers in meeting agreed delivery dates, and requests from clinicians to pilot more extensively the clinical record before full scale implementation, NHS Connecting for Health reviewed its delivery timetable between December 2004 and June 2005. The outcome was a move away from the original structure of Phases and Releases (Figure 2), with new functionality being delivered in a different order from that originally envisaged. NHS Connecting for Health has given particular priority to delivering the functionality needed to support Choose and Book, the Electronic Prescribing Service, Picture Archiving and Communications Systems (PACS) and providing Spine-compliant local systems to support NHS organisations in urgent need of new or replacement IT systems. Deployment of the clinical record is now expected to commence in a pilot form in late 2006, and in its full form from late 2007.

2 Initial phased deployment timetable

Phase 1 Release 1 – Development to be completed by June 2004, roll-out to be completed by December 2004 – This phase will install systems, hardware and software to form the framework to build future functionality, including Personal Demographics Service, the Personal Spine Information Service, the Transaction Messaging System and the enabling technology for Choose and Book, and Electronic Transmission of Prescriptions.

Phase 1 Release 2 – Development to be completed December 2004, roll-out to be completed by June 2005 – This phase will manage the more complex business and message handling processes, including clinical situations. It includes full Choose and Book functionality; outpatient clinic letters; inpatient discharge summaries; report of the single assessment for elderly people; diagnostic imaging and pathology results; screening results; recording of care episode events; and routing of orders for some blood tests and diagnostic images.

Phase 2 Release 1 – Tentatively timetabled for development to be completed by June 2005, roll-out to be completed by December 2006 – This phase was planned to add: National Service Frameworks assessment and review record; secondary uses of Spine data; planning and recording of the total care journey – integrated care pathways; full linking and electronic transfer of correspondence; pathology and image order and result; and integration of dental services.

Phase 2 Release 2 – Tentatively timetabled for development to be completed by June 2006, roll-out to be completed by December 2008 – Included greater sophistication in the technology available with an increased level of integration and seamless care in three key areas: more sophisticated access control services; extensions of the Choose and Book service; and links to remote care settings. Patients will also be able to place elements of their medical history in a virtual "sealed envelope", allowing them to more closely control access to their data.

Phase 3 – Tentatively timetabled for development to be completed by January 2009, roll-out to be completed by December 2010 – Further enhancement of systems and processes to ensure seamless care. The scope of this phase was deliberately open to allow a flexible response to ever changing clinical priorities and process. Likely trends, however, included:

- The majority of clinical events and episodes will be recorded electronically; the majority of clinical processes will be supported by IT, reducing costs and providing a faster, more effective patient journey.
- Clinicians will have widespread access to information and integrated decision support at the point and time of need, with links into the knowledge base, improving decision making and hence clinical outcomes.
- This information will enable the development of individually tailored care pathways with linked tracking and exception reporting and dynamic reporting of progress; workflow will trigger alerts to clinicians both when planned events fail to take place, and when expected outcomes are not achieved.
- Systems will be "self aware" with sophisticated error and pathway deviation monitoring enabling consistent care and a consequent reduction in mistakes due to human error.

Source: National Audit Office analysis of NHS Connecting for Health Integrated Care Records Service Approvals to Proceed, October 2003

12 *Delivering 21st Century IT support for the NHS – National Strategic Programme.* Department of Health, June 2002.

1.12 Achieving this phased timetable of releases needed work to proceed concurrently on all of the projects making up the Programme. Progress on the Spine was particularly important, however, because the Spine:

- Controls access to many of the Programme's systems and deliverables, for example, all users logging on to systems need to do so through the Spine.
- Handles the transmission of information and messages between systems and NHS locations. In practice, the aspects of the Spine controlling access to other systems and transmitting messages have been operating since 2004.
- Holds the summary information on patients that forms the core of the NHS Care Records Service.

What the Programme has achieved

a) Progress

1.13 By 3 April 2006, the Programme had achieved the following:

- 9,600 initial deployments of software to NHS entities had been made across the five Clusters.
  - 7,639 Choose and Book deployments.
  - 1,153 Electronic Prescribing Service (EPS) deployments.
  - 779 LSP deployments of which there were:
    - 9 Acute Patient Administration Systems.
    - 10 Mental Health Patient Administration Systems.
    - 17 Community Hospital Patient Administration Systems.
    - 106 Community Care Systems.
    - 30 PACS deployments.
    - 607 other deployments including GP systems, Single Assessment Process and Map of Medicine.
- a total of 726,843 prescriptions had been issued using the Electronic Prescribing Service.
- 261,893 Choose and Book bookings had been made.
- over 20 million images are stored using PACS.
- 167,946 registered NHSmail users, over 80,000 are active users of the system.
- 14,130 New National Network (N3) connections had been made.
- 208,990 NHS staff have been registered for issue with Smartcards for secure access.

Service volumes have continued to grow rapidly since then.

1.14 **Figure 3 on pages 14 to 23** shows the progress on the main projects which make up the National Programme to 3 April 2006, and the costs of the main contracts.

What NHS Connecting for Health delivers to the NHS in a typical month

Implementation Activity

- 3 Patient Administration Systems implemented
- 500,000 patient records converted and cleansed
- 200 NHS sites have systems upgraded
- 600 new N3 connections
- 14,000 Smartcards issued allowing secure access to new systems
- 1,700 site visits to plan deployments
- 6 PACS implemented

Service Provision

- 8.5 million x-ray and other images stored
- 15 million patient-related messages transmitted via the Spine
- 1.8 million pathology results sent electronically to GPs
- 3.5 million messages between GPs and PCTs
- 14 million emails sent using NHSmail
- 600,000 letters issued electronically to patients
- 1.3 million visits to the nhs.uk website, managed by NHS Connecting for Health
- 100 terabytes of data transmitted over the N3 network – equivalent to 4.5 billion written pages

Source: NHS Connecting for Health

3 Principal projects and systems making up the Programme and managed by NHS Connecting for Health

Project	What it will do	Progress achieved	
		Procurement	
		OJEU notice issued	Contract signed
National Infrastructure			
New National Network for the NHS (N3) Prime contractor – BT	Provide a rapid, secure, robust, reliable network across the NHS with sufficient capacity to enable efficient communication within and between NHS organisations into the future. N3 is essential to the smooth working of all the other initiatives within the National Programme. It replaces the existing NHS Net. An important feature of N3 is that as the volume of connections increases, the quality of each individual connection does not degrade.	5 June 2003	19 February 2004
National Services			
National Data Spine Prime contractor – BT	Hold summary information about every patient's health and care, forming the core of the NHS Care Records Service – e.g. NHS number, date of birth, name and address, allergies, adverse drug reactions and major treatments. Control access to patients' clinical information and act as the gatekeeper to any local clinical functionality delivered through the Local Service Provider's National Care Records Service. Support the transmission of information between other systems. The Secondary Uses Service will provide anonymous data for research and analysis of trends in health.	7 February 2003	8 December 2003

Source: Deployment statistics – NHS Connecting for Health National Programme Office

Progress achieved		Contracted cost (£ million at contract award prices, number of years varies)
Development and Deployment		
Target	Position as at 3 April 2006	
Contract set in-service targets of:		£530m over 7 years
■ 6,000 sites connected by 31 March 2005	Target of 6,000 sites connected by 31 March 2005 was achieved.	
■ 12,000 sites connected by 31 March 2006	The March 2006 target of 12,000 connections was achieved in December 2005, three months early.	
■ All 18,000 NHS sites connected by 31 March 2007	By 3 April 2006, 14,022 connections had been made. A total of 9,751 GP practices had been connected, 91.5 per cent of the total GP and branch surgery connections.	
P1R1 – June 2004	Parts of P1R1 went live 29 June 2004 as planned with all other parts being introduced in accordance with agreed revised timescales in April 2005, some ten months later than originally planned.	£620m over 10 years to 2013-14
P1R2 – December 2004 **P2R1** – June 2005 Milestones for later stages to be set later.	In December 2004, P1R2 and P2R1 releases were reorganised and replaced by a revised set of five software releases covering the functionality of these two releases, and the order in which functionality was to be delivered also rephased. The revised set of releases for 2005 have all been completed to the revised target. Release 5 was deployed from 19 December 2005, but the payment to BT included a retention for the remaining defects within that Release. Release 5 has since been delivered in full and paid for. For 2006 and 2007, the number of Spine releases will be limited to two functional releases a year, which the Local Service Providers could take together if they so wished. Further go-live dates based on content agreed in September 2005 were agreed for 2006 and 2007: ■ Release 2006A: in five releases to go live between March and August 2006; ■ Release 2006B: November 2006; ■ Release 2007A: March 2007; ■ Release 2007B: November 2007.	

3 Principal projects and systems making up the Programme and managed by NHS Connecting for Health *continued*

Project	What it will do	Progress achieved	
		Procurement	
		OJEU notice issued	Contract signed
National Services *continued*			
Choose and Book Prime contractor – Atos Origin	Initially, to enable electronic booking of first hospital appointments for patients at a date, time and place convenient for them.	9 February 2003	8 October 2003
NHSmail – email and directory service Prime contractor – Cable & Wireless	Email and national directory service for all NHS staff, across all NHS organisations in England.	March 2004	1 July 2004
Electronic Prescription Service	Transfer prescriptions electronically from GPs and other prescribers to the chemist or pharmacist nominated by the patient and to the Prescription Pricing Authority.	–	–
Picture Archiving and Communications Systems (PACS)	Provide systems to capture, store, distribute and display static or moving digital medical images, such as X-rays.	–	–
Quality Management and Analysis System	Collate information for Primary Care Trusts and GPs on the quality of care delivered by GP practices measured against national achievement targets in GPs' contract. System makes payments to GPs amounting to £660 million a year.	–	–

Source: Deployment statistics – NHS Connecting for Health National Programme Office

Progress achieved		Contracted cost (£ million at contract award prices, number of years varies)
Development and Deployment		
Target	Position as at 3 April 2006	
Target for first booking June 2004. No further public targets were set out for Choose and Book.	Software delivered on time. First booking achieved 2 July 2004. Since then, take up has been slower than expected and at October 2005 was about a year behind schedule. By 3 April 2006, 245,218 bookings had been made, with 4,109 practices making at least one booking. 98,007 bookings were made during March 2006. Volumes are growing rapidly at around 40 per cent month on month. (Approximately 12 per cent of bookings were being made through the system.)	£64.5m over 5 years
Service available for use – October 2004.	All services developed and ready for go-live on time in October 2004. By end March 2006, 167,946 staff had registered and 80,183 were active users.	£50–90m, depending on usage, over 9 years
Target for first deployment by February 2005. December 2005: 50 per cent of all sites should be capable of issuing electronic prescriptions. December 2007: 100 percent of all sites should be capable of issuing electronic prescriptions.	Target for first deployment met in February 2005. By 31 March 2006, 1,034 GP sites were technically live (i.e. ready to switch on) and 296 sites were using the EPS system. 148 community pharmacies were technically live and 11 were using the system. 2 of the 10 suppliers of pharmacy systems had achieved "authority to roll out" for their system. The volume of electronic prescriptions continues to grow rapidly. By end March 2006, a cumulative total of 726,843 prescriptions had been issued electronically. 167,242 prescriptions were issued in February 2006 and 260,898 prescriptions in March 2006.	Functionality provided by the Spine and Local Service Provider contracts
Full deployment of 130 PACS by March 2007.	Implementations were delayed due to an unsuccessful judicial review application. However, by 3 April 2006, 30 deployments had been made. In the North West and West Midlands Cluster, CSC replaced its original PACS supplier with GE in March 2006.	£245m cost of central data store over ten years to 2013-14 *plus* £775m to be paid for by local NHS Trusts
Full deployment January 2005.	Delivered on time in August 2004. Nine releases delivered by March 2006 with all 8,298 GP practices using the system daily. Working solution delivered August 2004, with six releases delivered by March 2005, and 8,298 GP practices covered by January 2005. The latest release of QMAS went live in March 2006.	–

3 Principal projects and systems making up the Programme and managed by NHS Connecting for Health *continued*

Local Services (Local Service Providers and main subcontractor)[1]		Progress achieved	
		Procurement	
		OJEU notice issued	Contract signed
Responsible for: ■ Providing and maintaining the local NHS Care Records Service to all NHS care settings; and ■ PACS solutions which connect to the National Spine in accordance with NHS Care Records Service specification.	North Eastern Cluster Prime contractor: **Accenture** delivering 'Lorenzo' and other software solutions developed by **iSOFT**.	7 February 2003	8 December 2003
Responsible for: ■ Providing and maintaining the local NHS Care Records Service to all NHS care settings; and ■ PACS solutions which connect to the National Spine in accordance with NHS Care Records Service specification.	London Prime contractor: **BT** delivering Carecast system developed by **IDX**.	7 February 2003	8 December 2003

Source: Deployment statistics – NHS Connecting for Health National Programme Office

NOTES

1 Prime contractors are supported by numerous subcontractors. This Figure shows only the main subcontractor for each Local Service Provider.
2 Only Accenture's contracts include deployments of Map of Medicine and Portals to Trusts.

Target	Progress achieved Development and Deployment Position as at 3 April 2006	Contracted cost (£ million at contract award prices, number of years varies)
P1R1 – June 2004. **P1R2** – December 2004.	Milestones for P1R1 revised, dividing P1R1 into four releases for delivery from October 2004. The last of these milestones was achieved in November 2005, 13 months later than the original target date. Subsequent deliveries of P1R2 have been delayed by over a year. By 3 April 2006, 1,586 deployments had been made:	£1,099m over ten years to 2013-14

Programme	System	Deployments
Choose and Book (total = 1,129)	Patient Administration System	13 Trusts
	GP System	368 practices
	Web Based Referrer	748 practices
EPS (total = 204)	GP System	174 practices
	Pharmacy System	30 pharmacies
LSP Deployments (total = 253)	Acute Departmental Systems	12 Trusts (including 1 Acute PAS)
	Emergency Care	1 Ambulance Trust (including 1 Acute Trust and 15 ambulances)
	Mental Health	6 Trusts (including 2 PAS)
	Primary Care	200 various
	PACS	1 Trust
	Map of Medicine and Portals[2]	33 Trusts

Target	Progress achieved Development and Deployment Position as at 3 April 2006	Contracted cost (£ million at contract award prices, number of years varies)
P1R1 – September 2004. **P1R2** – March 2005.	BT deployed a Patient Administration System connected to the Spine, the first deployment of a system specifically written for the Programme, in November 2005, in accordance with the revised agreement, some 14 months later than the original target date. By 3 April 2006, 1,520 deployments had been made:	£996m over ten years to 2013-14

Programme	System	Deployments
Choose and Book (total = 1,284)	Patient Administration System	17 Trusts
	GP System	179 practices
	Web Based Referrer	1,088 practices
EPS (total = 168)	GP System	163 practices
	Pharmacy System	5 pharmacies
LSP Deployments (total = 68)	Acute Departmental Systems	6 Trusts (including 1 Acute PAS)
	Emergency Care	0 Trusts
	Mental Health	0 Trusts
	Primary Care	53 various
	PACS	9 Trusts

3 Principal projects and systems making up the Programme and managed by NHS Connecting for Health *continued*

Local Services (Local Service Providers and main subcontractor)[1] *continued*		**Progress achieved**	
		Procurement	
		OJEU notice issued	Contract signed
Responsible for: ■ Providing and maintaining the local NHS Care Records Service to all NHS care settings; and ■ PACS solutions which connect to the National Spine in accordance with NHS Care Records Service specification.	Eastern and East Midlands Prime contractor: **Accenture** delivering 'Lorenzo' and other software solutions developed by **iSOFT**.	7 February 2003	23 December 2003

Source: Deployment statistics – NHS Connecting for Health National Programme Office

NOTES

1 Prime contractors are supported by numerous subcontractors. This Figure shows only the main subcontractor for each Local Service Provider.
2 Only Accenture's contracts include deployments of Map of Medicine and Portals to Trusts.

Target	Progress achieved Development and Deployment Position as at 3 April 2006	Contracted cost (£ million at contract award prices, number of years vary)
P1R1 – August 2004. **P1R2** – December 2004.	Milestones for P1R1 revised, dividing P1R1 into four releases for delivery from October 2004. The last of these milestones was achieved in July 2005, nine months later than the original target date. Subsequent deliveries of P1R2 have been delayed by over a year. Some interim deployments were made ahead of the target date of December 2004. By 3 April 2006, 1,899 deployments had been made:	£934m over ten years to 2013-14

Programme	System	Deployments
Choose and Book (total = 1,238)	Patient Administration System	19 Trusts
	GP System	491 practices
	Web Based Referrer	728 practices
EPS (total = 280)	GP System	223 practices
	Pharmacy System	57 pharmacies
LSP Deployments (total = 381)	Acute Departmental Systems	10 Trusts
	Emergency Care	2 Ambulance Trusts (including 9 Acute Trusts and 32 ambulances)
	Mental Health	4 (all PAS)
	Primary Care	238 (including 17 Community Hospital PAS)
	PACS	1
	Map of Medicine and Portals[2]	126

3 Principal projects and systems making up the Programme and managed by NHS Connecting for Health *continued*

Local Services (Local Service Providers and main subcontractor)[1] *continued*

		Progress achieved	
		Procurement	
		OJEU notice issued	Contract signed
Responsible for: ■ Providing and maintaining the local NHS Care Records Service to all NHS care settings; and ■ PACS solutions which connect to the National Spine in accordance with NHS Care Records Service specification.	North West and West Midlands Prime contractor: **Computer Services Corporation** (CSC) delivering 'Lorenzo' and other software solutions developed by **iSOFT.**	7 February 2003	23 December 2003
Responsible for: ■ Providing and maintaining the local NHS Care Records Service to all NHS care settings; and ■ PACS solutions which connect to the National Spine in accordance with NHS Care Records Service specification.	Southern Prime contractor: **Fujitsu** delivering the 'Millennium' system developed by **Cerner.**	7 February 2003	26 January 2004

Source: Deployment statistics – NHS Connecting for Health National Programme Office

NOTES

1 Prime contractors are supported by numerous subcontractors. This Figure shows only the main subcontractor for each Local Service Provider.
2 Only Accenture's contracts include deployments of Map of Medicine and Portals to Trusts.

Progress achieved		Contracted cost (£ million at contract award prices, number of years varies)
Development and Deployment		
Target	Position as at 3 April 2006	
P1R1 – June 2004. **P1R2** – December 2005.	In April 2005, P1R1 was divided into five releases for delivery between June 2004 and September 2005. Almost all of the functionality has been delivered in advance of new target dates, though a small element will now be delivered in May 2006. The majority of functionality required has been delivered in advance of the new target dates, but some elements of the releases will now be delivered some 19–22 months later than originally planned. By 3 April 2006, 2,492 deployments had been made: **Programme** / **System** / **Deployments** Choose and Book (total = 2,158): Patient Administration System — 15 Trusts GP System — 974 practices Web Based Referrer — 1,169 practices EPS (total = 257): GP System — 230 practices Pharmacy System — 27 pharmacies LSP Deployments (total = 77): Acute Departmental Systems — 14 Trusts (including 6 Acute PAS) Emergency Care — 0 Trusts Mental Health — 4 Mental Health PAS Primary Care — 57 various PACS — 2 Trusts	£973m over 10 years to 2013-14
P1R1 – September 2004.	In April 2005, Fujitsu appointed Cerner to replace IDX as its main subcontractor. The releases were redefined into four releases R0, R1, R2 and R3 covering the same functionality as all five of the original releases so that full functionality would still be delivered to the original end date. The deployment of PACS is approximately 50 per cent completed, is on time and will complete in line with both the contract and the NHS target of 2007. P1R1 has been split into two phases, for delivery in December 2005 and August 2006, some 18 months later than originally planned. The first Cerner Patient Administration System was deployed at Nuffield Orthopaedic Centre in December 2005. By 3 April 2006, 2,103 deployments had been made: **Programme** / **System** / **Deployments** Choose and Book (total = 1,830): Patient Administration System — 18 Trusts GP System — 771 practices Web Based Referrer — 1,041 practices EPS (total = 244): GP System — 215 practices Pharmacy System — 29 pharmacies LSP Deployments (total = 29): Acute Departmental Systems — 4 Trusts (including 1 Acute PAS) Emergency Care — 0 Trusts Mental Health — 0 Trusts Primary Care — 8 various PACS — 17 Trusts	£996m over ten years to 2013-14 *(when the common solution project was dissolved this added £62 million to the original £934m cost of the contract because of losses of economies of scale)*

1.15 One key factor affecting the Local Service Providers' rate of deployment of systems has been the heterogeneous nature of the NHS. For example, each NHS organisation may occupy single or multiple sites, within modern or older premises, with each having different mixes of functions and specialisations. Also, each NHS organisation may employ different systems, different numbers of systems, and in some instances a number of systems to do the same thing. For example, one Oxfordshire hospital had seven different pathology systems before it took the decision to reduce that number before deployment of the Local Service Provider's system. This has meant that Local Service Providers' solutions need to be tailored to each organisation's requirements. These differences in requirements have meant that even after a Local Service Provider has ensured that its solution meets the requirements of one organisation, new work is needed to roll-out that solution to each organisation within its Cluster, making the task of rolling out systems considerably harder than in more homogeneous organisations.

b) Expenditure and benefits of the Programme

Expenditure

1.16 The National Programme was launched against the background of the April 2002 report by Sir Derek Wanless, *Securing our future health: taking a long term view*[13], which recommended the doubling of expenditure on IT in the NHS and its ring fencing to prevent diversion for other purposes. Although not set as a mandatory financial target, Ministers have accepted this recommendation and have stated their intention to increase IT expenditure to 4 per cent of the NHS budget[14]. This is around £3.4 billion a year based on the 2006-07 total NHS settlement of £84.4 billion.

1.17 The National Programme contains a large element of central funding to make it easier for NHS organisations to increase their use of IT by relieving them of much of the cost of developing and implementing new systems. Nonetheless, local NHS organisations will still need to spend money on IT for a number of purposes. They will retain responsibility for their local IT networks and infrastructure, for IT outside the current scope of the Programme (for example, finance and human resources systems), and for maintaining existing clinical systems until they have been replaced by systems supplied through the Programme. NHS Connecting for Health expects local IT expenditure over the life of the Programme to exceed NHS Connecting for Health's expenditure, and for the two together to total some £20 billion to 2013-14.

1.18 NHS Connecting for Health's management of expenditure on the Programme focuses mainly on its expenditure under the contracts with suppliers and on its own activities. We are satisfied that central expenditure is being managed within budget. Neither NHS Connecting for Health nor the Department centrally plan local NHS expenditure on IT or other costs associated with the Programme, and management of local IT expenditure is a matter for the local NHS bodies concerned. NHS Connecting for Health therefore does not seek to maintain a detailed estimate of the overall cost of the Programme. It does, however, make broad projections of expenditure. These projections cover both expenditure on the Programme and other NHS IT expenditure. The projections are prepared on a prudent basis to ensure that possible spending needs are recognised in advance. Accordingly, whilst some items of spending are definite and certain, others are subject to considerable uncertainty.

1.19 Our analysis of these projections indicated that provision had been made for total spending on the Programme (at a gross level, i.e. without deduction for possible savings or benefits) of £12.4 billion (at 2004-5 prices)[15] over the ten year life of the main contracts, to 2013-14. This is not a budget and does not take account of the £860 million savings achieved through the Enterprise Wide Agreements (paragraph 3.3). The total spending comprises:

13 *Securing our future health: taking a long term view.* Sir Derek Wanless, April 2002. The report recommended the doubling of expenditure on IT in the NHS and its ring fencing to prevent diversion for other purposes.
14 Hansard. Parliamentary Answer on behalf of the Secretary of State for Health, 4 March 2004.
15 Including capital investment but excluding depreciation.

a Forecast national expenditure of £9.2 billion comprising:

1.20 The contracted costs of the Programme, over their respective terms, which are as follows:

- **£6,220 million** on the contracts placed in 2003 and 2004, in line with the announcements made at the time of the contract awards. These contracts are being managed within this total.
- **£382 million** on contracts and projects added to the scope of the National Programme, following the approval of separate business cases, comprising:
  - £245 million provision for the central data stores required for Picture Archiving Communication Systems (PACS), following the Department's decision in September 2004 to make PACS a core part of the National Programme.
  - £88 million to provide NHSmail – the e-mail and directory service for all NHS staff.
  - £49 million for additional services in relation to NHSmail, such as the relay service and archive facility.
- **£239 million** on additional services to be purchased beyond the scope of the original national core contracts, comprising:
  - An estimated £69 million to provide for extra capacity in connections for the New National Network (N3).
  - £80 million to deliver additional services to Choose and Book to support the Department's new policy requirements such as Extended Choice.
  - £90 million to support systems integration, for example to enable any suppliers providing IT in the NHS to test the integration of their software with the Spine.

1.21 Except for the £69 million to provide the extra capacity for N3, for which expenditure is dependent on demand, the above are fixed price contracts, although contractors can be paid less if they fail to deliver fully in line with their contracts.

1.22 In the two years to end of March 2006, actual expenditure on the originally contracted services has been lower than planned, with £654 million (estimated outturn) spent against expected expenditure of £1,448 million, reflecting the slower than planned and revised profile of delivery of some systems and, significantly, contractual provisions that suppliers will only be paid once services are proven to be delivered and working. The total contract value may be depressed for some contractors as a consequence of their delays.

1.23 £1.9 billion in other central expenditure, primarily by NHS Connecting for Health on centrally managed projects and services within the Programme, and running NHS Connecting for Health. These are not all based on signed contracts but represent prudent provision to protect funding in case an extension of the scope of the Programme is approved at a later date. These figures also subsume some of the costs and all of the IT services delivered by the former NHS Information Authority, which has been abolished. The Authority's expenditure in its last year of operation (2004-05) was £219 million, (including £49 million to support NHS Connecting for Health), which approximates to the annualised central costs of the Programme.

1.24 NHS Connecting for Health told us that on the current scope of the Programme, they believe that actual expenditure will be less than £1.9 billion, because once the initial stages of system development and deployment have passed, NHS Connecting for Health's task will diminish to that of a service management function. On the basis of fixed-term contracts for employees and facilities, NHS Connecting for Health told us that it expected the maximum outturn for the management of the Programme to be less than £1.5 billion over the ten-year term. At that point the size and status of the organisation would need review in accordance with the principles of the Department's 2004 review of its Arm's Length Bodies.

1.25 £337 million extrapolation of the cost of the core contracts to cover the whole of the period to 2013-14. This is a notional allowance to allow expenditure to be projected over ten years. It is needed because two contracts reach the end of their life before the end of ten years – after five years in the case of Choose and Book and seven years in the case of N3 – at which point further provision will be needed to take forward the services provided. However, NHS Connecting for Health does not consider it practicable at present to estimate the cost of doing so, given the pace of change in IT and the likelihood that the services that will be required in the future will differ from those provided under the current contracts. This allowance is therefore calculated simply by extending on a pro-rata basis the level of spending under the current contracts.

b Forecast local expenditure of £3.4 billion

1.26 This is not committed expenditure but is based mainly on the forecasts of expenditure made in the investment appraisals carried out at the time of the award of the main LSP contracts in late 2003 and early 2004. These estimated that the local NHS would incur gross IT expenditure totalling some £2.6 billion over the life of the contracts, for example on staff training, data conversion and strengthening local IT networks. NHS Connecting for Health also estimated that the contracts for PACS would involve local IT spending of £775 million, subject to confirmation of the exact spending required in local business cases.

1.27 The investment appraisal made clear that the local NHS would also make significant savings as a result of the Programme, which would substantially offset the local costs, for example as a result of existing systems no longer needing to be paid for once they had been replaced by systems supplied through the Programme. These savings are considered further in the benefits sections below.

1.28 On 30 May 2006, the Minister of State for Reform (Lord Warner of Brockley) who is responsible for the Programme, was reported in the media as having said that the full cost of the Programme was likely to be nearer £20 billion. NHS Connecting for Health have told us that he was not referring solely to the costs of the Programme but to the total expenditure on NHS IT over ten years (paragraph 1.17).

Benefits

1.29 In its business cases for the components of the Programme, the Department put a financial value on benefits where it could, but, as the main aim is to improve services rather than reduce costs, it was not possible to do so in all cases. As a consequence, it was not demonstrated that the financial value of the benefits exceeds the cost of the Programme. The Treasury's guidance[16] states that benefits should be valued when possible, but recognises that sometimes they cannot be. In this case, the Treasury has accepted the Department's approach and has approved all expenditure so far made and planned.

1.30 Nonetheless, considerable efforts were made to specify and describe the high level benefits that the different projects within the Programme are intended to deliver, for example in the agency's National Programme Implementation Guide[17], and documentation setting out the intended timeline and milestones for delivery of benefits[18]. Additional savings are also expected, for example by using the NHS Connecting for Health's buying power to drive down the prices paid for IT goods and services and in staff time saved through using the Programme's services. Some of these savings are planned to contribute to the Department's Gershon economies.

1.31 NHS Connecting for Health has not carried out a detailed analysis to quantify the patient safety benefits expected from the Programme, but, based on a limited preliminary analysis, believes they could be worth many billions over ten years. This estimate includes:

- £2.5 billion as the human value of preventable fatalities from medication errors arising from inadequate information about patients and medicines.
- A large proportion of the £500 million spent each year on treating patients who are harmed by medication errors and adverse reactions.
- A reduction in the payments by NHS Trusts each year (approximately £430 million each year) for settlements made on clinical negligence claims.

16 The Green Book. *Appraisal and Evaluation in Central Government*. HM Treasury, 2004.
17 Accessible at http://www.connectingforhealth.nhs.uk/implementation/
18 http://www.connectingforhealth.nhs.uk/all_images_and_docs/benefits_timeline.pdf

1.32 The Programme is also expected to release IT funds within the local NHS, for example when the deployment of new systems paid for by Connecting for Health replaces systems that local NHS bodies had previously been paying for. In the case of the LSP contracts, local savings were expected to offset nearly half the local costs over the lives of the contracts. In the case of PACS, local savings were expected fully to offset the local costs. Smaller savings are also expected in other areas, for example where local NHS bodies use N3 or NHSmail to replace services for which they are currently paying – the business case for NHSmail estimated such savings of £185 million (paragraph 3.25).

1.33 NHS Connecting for Health has not sought to monitor systematically the actual impact the Programme is having on local IT spending or the extent to which the initial estimates of its impact are being borne out in practice. However, it believes that experience of individual deployments so far will enable local savings on a substantial scale.

To ensure affordability, resources have been made available to NHS Trusts

1.34 Concerns have been expressed by NHS Acute Trusts about the local affordability of PACS. To address affordability, an annual uplift to the tariff has been made to facilitate the implementation of the Programme. In 2006-07, the total uplift is £163 million which includes £63 million for standardisation and integration of critical departmental systems (pathology, pharmacy, theatres, radiology and maternity) £55 million for patient administration systems conversion to Spine technical and data quality compliance standards, and £25 million for PACS implementation costs.

PART TWO
Preparing to deliver the systems

The Programme has Ministerial support

2.1 In February 2002, the Prime Minister hosted a seminar for options for future NHS information systems, and subsequently approved the strategy for the Programme. In June 2002 Ministers launched the Programme.[19] From the outset, the management structure for the Programme included endorsement and sponsorship by the Secretary of State, with day to day oversight provided by Ministers within the Department of Health (since May 2005, by Lord Warner).

2.2 In October 2002, the Department of Health appointed a Director General with experience of implementing large technology programmes in both the public and private sectors. He has recruited a programme management team drawn from the public and private sectors. However, considerable difficulty was experienced in achieving this quickly, in particular the recruitment of a Chief Operating Officer, which affected the pace of early work on the Programme.

2.3 The implementation of the Programme does not feature in current Department of Health Public Service Agreement targets or supporting targets. It is, however, a necessary enabler for a number of Ministerial commitments relating to the electronic booking of appointments for patients referred to hospital and the electronic transmission of prescriptions.

2.4 The Programme has been introduced against a background of many initiatives, changes and reorganisations in the NHS. These included: between 2003 and 2005 new contracts covering almost all NHS staff; Payment by Results and Patient Choice; Foundation Trusts; and increasing private sector provision and reconfigurations of Primary Care Trusts, Strategic Health Authorities and ambulance services announced in 2005 and 2006. In addition, the Modernisation Agency and the NHS Information Authority – which were expected to work closely with NHS Connecting for Health as the Programme was introduced – ceased to exist in March 2005. The former of these had been charged with leading on the redesign of business processes to ensure the benefits of the Programme were fully realised, and the latter with responsibility for running all pre-existing national systems.

Taking account of earlier experiences, the Department decided to procure and manage the Programme centrally

2.5 As has been set out in a number of past National Audit Office and Committee of Public Accounts reports,[20] the NHS had a poor track record in procuring and delivering IT systems to improve patient care and, in the Department's view, local procurement had offered poor value for money. To avoid these historical problems, the Department decided to pursue a dual policy of procuring large systems centrally; implementing them through Local Service Providers in conjunction with NHS Trusts, having left all local IT resources in place; and providing support for systems as they are implemented locally.

2.6 The Department also considered that central procurement was the only way to deliver an integrated national system, for example because of the difficulty of integrating large numbers of system components. The purchase and use of fewer types of systems was intended to reduce costs through aggregation, improve effectiveness through the employment of robust suppliers and systems and make it quicker and cheaper to introduce subsequent amendments and upgrades. In addition, it aimed to promote standardisation, make it easier for staff to move between NHS employers without requiring re-training, enable easier transfer of data, contribute to the achievement of patient centric care, and overcome financial and operational inefficiencies in procurement. NHS Connecting for Health would also be able to use its buying power to achieve lower prices and better contractual terms from suppliers and their subcontractors than individual NHS bodies or consortia could achieve on their own, and enable the transfer of financial and completion risk to suppliers.

NHS Connecting for Health has put in place sound project management

2.7 The procurement process was strengthened by the use of civil service protocols. Also, as recommended by the Office of Government Commerce (OGC) for managing government projects, NHS Connecting for Health is using the PRINCE2™ tool to manage the projects within the Programme. It has conducted Gateway™ reviews

19 *Delivering 21st Century IT support for the NHS – National Strategic Programme*. Department of Health, June 2002.

20 *The Purchase of Read Codes and the Management of the NHS Centre for Coding and Classification*, National Audit Office, March 1998 (HC 607, 1997-98). *The Hospital Information Support Systems Initiative* Committee of Public Accounts 7th Report 1996-97 (HC 97), *Wessex Regional Health Authority – Regional Information Systems Plan* Committee of Public Accounts 63rd Report 1992-93 (HC 658). *The 1992 and 1998 Information Management and Technology Strategies of the NHS Executive*, National Audit Office, April 1999 (HC371, 1998-99).

on the different component projects of the National Programme and of the Programme as a whole at key stages in their development, with reports made direct to Senior Responsible Owners of the projects. It has also established a National Programme Office to provide central programme management services to support the planning, control and reporting of activities within the Programme. The Committee of Public Accounts has previously highlighted the importance of risk management and professionalism for the successful implementation of IT systems.[21]

2.8 As part of our examination, we commissioned QinetiQ Ltd to make an independent appraisal, against an internationally recognised systems engineering standard,[22] of management processes in place within NHS Connecting for Health. Its observations were that project control processes and project planning processes were in place, as shown in **Figure 4**.

2.9 QinetiQ also observed that the agency had adopted strong and forceful programme leadership, and employed high calibre people. These factors contributed to the agency having a strong team dynamic and feeling a strong sense of ultimate purpose.

NHS Connecting for Health has sought to ensure the systems meet users' needs

2.10 In accordance with current good practice, procurement and development of the Programme centred on an "Output Based Specification" (OBS) for the planned system – a statement of the functions that the planned IT system is intended to perform. Prior to the establishment of NHS Connecting for Health, the NHS Information Authority initiated development of the OBS in February 2002 by seeking assistance for source material, hands on help with the development, and quality assurance and review input. The NHS Information Authority received much source material for the OBS from 15 NHS bodies which had developed specifications for their own patient record services following the 1998 IT strategy of the NHS Executive. It also held meetings with, and made presentations to, Chief Information Officers of NHS bodies such as Strategic Health Authorities, Electronic Record Development and Implementation Programme (ERDIP) sites, IT directors and the Academy of Medical Royal Colleges Information Group. These groups were also involved in reviews of the early drafts of the OBS.

2.11 The NHS Information Authority published a revised draft OBS for consultation in July 2002, requesting comments by September 2002 on:

- Whether the vision of the NHS Care Records Service was consistent with the overall objectives of the NHS.
- What phasing of NHS Care Records Service functions was required to create a long term basis for growth, while meeting specific targets and objectives in the short term.
- Whether there were any gaps in the specification which needed to be filled.
- Whether the overall level of detail was sufficient for the procurement of such services.
- Whether the standards and national services were appropriate to support implementation of the local services.

4 Examples of QinetiQ's key findings on project planning and project control

On project planning

- Milestone completion was the primary method used for setting targets and measuring progress.
- Schedules were controlled, reviewed and adjusted when necessary.
- A tool, Primavera, with standard work breakdown structures and control milestones, underpinned planning activities across the Programme.

On project control

- Project control structures were consistently deployed, and ensured that Programme and supplier performance was monitored.
- When project achievement did not meet planned targets, corrective action was initiated through discussions with suppliers.
- Projects were re-planned as required by changes in constraints (for example, dependency on other suppliers delivering on time), or achievements.

21 Committee of Public Accounts. *Improving the delivery of Government IT projects, First Report 1999-2000 (HC 65).*

22 QinetiQ used ISO 15288:2002 to make a Capability Appraisal of the processes in place. The ISO Standard represents a unanimous international consensus on the systems engineering processes critical to developing large and complex man-made systems. The QinetiQ report is published on the NAO website at www.nao.org.uk.

2.12 Some 190 responses were received from suppliers, clinicians, NHS IT departments and others. The OBS was revised in the light of these comments, and the subsequent draft was refined further with input from some 400 clinicians, Chief Information Officers and IT managers. NHS Connecting for Health then engaged a broad spectrum of NHS stakeholders encompassing leading clinicians, practitioners, policy advisers, health informaticians and managers, and included representatives from the Department of Health, the NHS Information Authority, Strategic Health Authorities, NHS Trusts, Primary Care Trusts, General Practitioners, academic groups and other government departments. The final OBS was issued to potential suppliers on 1 May 2003.

2.13 Whilst QinetiQ found that NHS Connecting for Health developed the OBS after engagement with a broad spectrum of NHS stakeholders, QinetiQ's review found that there was no recorded link between the detailed item in the OBS and the source of the person or group making the contribution. NHS Connecting for Health replied that these links were not directly attributable, given that much of the OBS was developed in workshops involving a cross section of stakeholders and NHS Connecting for Health had not had the resources to record the attributions individually.

The Care Record Guarantee sets out the standards required for confidentiality of patient records and consent to access and share records

2.14 Patients and doctors needed to be assured that the confidentiality of patients' records is protected. The Care Record Guarantee came about as a direct result of qualitative and quantitative research with patients and the public undertaken by the NHS Information Authority with the Consumers' Association and Health Which? in 2002. When given a series of potential safeguards and asked "what would reassure you most that the NHS is careful with your health information?", 45 per cent said a published sharing agreement. In response, drafting of the Guarantee (then called a charter) was begun in 2003 by 16 people from patient and citizen groups who formed a Public Advisory Board to the Programme. Drafting was completed in 2005 and the Care Record Guarantee was published by Ministers in May 2005 and revised following consultation in May 2006.[23] It sets out the principles that the Department and the NHS will apply when operating electronic patient records **(Figure 5)**. NHS Connecting for Health believes that these principles will allow much greater confidentiality over patient records than those currently capable of being exercised over paper patient records, which have inherent security weaknesses such as a lack of an audit trail.

2.15 In 2004, the Department established the Care Record Development Board (CRDB), a multidisciplinary group of patients, the public and clinicians. Chaired by its National Director for Patients and the Public, it takes the lead in considering ethical issues relating to the Programme. It concluded the production of the Care Record Guarantee. Its work also includes engaging with patients, the public and clinicians about their views on health information. This is an example of the establishment by a public body of a consultation exercise on the issue of a guarantee on the use of personal data.

5 The key principles of the Care Record Guarantee

- **Only authorised people will be allowed access to patient records.**
- **Only those involved in a patient's care will have access to records about identifiable individual patients** (the "legitimate relationship").
- **A record will be kept of everyone looking at a patient's record.** Audit trails will be maintained and regularly assessed, with patients being informed if their record has been accessed inappropriately.
- **Patients will be able to check their own care records and ask for factual inaccuracies to be corrected.**
- **Patients cannot opt out of having information recorded altogether.**
- **Patients will be able to opt out of information being shared.** Patients can have information placed by their clinician in a "patient's sealed envelope", which can only be accessed by another clinician with the patient's express consent, or if it is accessed in an emergency, the patient will be notified later.
- **Clinicians can withhold information on a patient's record from the patient.** Clinicians will have a "sealed envelope" in which they can place information which can only be viewed by other clinicians.

Source: Care Record Guarantee, Department of Health, May 2005

NOTE

On current plans, the sealed envelope will become available from late 2007/early 2008.

23 Department of Health Press Release 2005/0185, 23 May 2005.

Examples of initiatives to involve patients

- Six-monthly workshops with voluntary sector groups on the public sector information campaign on the Care Record Guarantee;
- Focus Groups, workshops and consultations to obtain input from patients for example on what patients want to enter into their records, access to children's records and how sealed envelopes will work;
- Patient members of boards for example Choose and Book, Service implementation and HealthSpace, to contribute to strategic thinking and policy formulation;
- Qualitative research with patients who have access to their GP records electronically to inform design of access for users;
- Planned six-monthly tracker research to measure effectiveness and penetration of the public information campaign and attitudes to the NHS Care Records Service.

Source: NHS Connecting for Health

2.16 The Care Record Development Board is continuing its work on several practical issues such as the content of the care record, sharing of information with non-NHS bodies such as local authority social services, special issues relating to children and young people and how the planned 'sealed envelopes' will work in practice.

2.17 In November 2004 the British Medical Association[24] set out that clinicians' expectations included secure access to electronic records and the protection of confidentiality, which is central to the doctor-patient relationship. It called for secure systems to address these concerns and to ensure that only authorised staff can change the content of records.

2.18 The Joint GP IT Committee[25] raised concerns about security issues within the Personal Demographics Service, which does not contain clinical information, but has since reported that the encouraging response and resultant collaborative work with NHS Connecting for Health has gone a good way towards starting to resolve these concerns. The Committee also told us that they have concerns about whether patients would be able to consent to the sharing of detailed clinical information from locally held IT records with other parts of the NHS. Their view was that patients should be asked for their consent for such sharing, whereas the current intention is that, whilst patients will be able to opt out from sharing, their consent would otherwise be assumed. The Committee are continuing discussions on these issues with NHS Connecting for Health. The Care Record Development Board has given advice on how confidentiality of the Personal Demographics Service should be maintained.

A system of access control has been devised but good working practices remain essential

2.19 The past standards of physical security maintained to control access to patients' paper records in the NHS have been highly variable and in a few cases very poor. All systems, whether electronic or paper based, have relied to a degree on compliance with procedure. Electronic records present the potential for records to be accessed from anywhere on the network, though on the other hand, they provide an audit trail of who has accessed records as well as an opportunity for consistent standards of access control. We consider that the structure for monitoring, measuring and managing potential threats to the infrastructure and internal systems is commensurate with the high standards required of a programme of this scale.

2.20 NHS Connecting for Health has adopted the highest security standards for access to patient information. The NHS is the only public sector organisation to have universally adopted the electronic Government Interoperability Framework (e-GIF)[26] standard Level 3 to verify the identity of users for secure registration and authentication. To comply with Level 3 it is necessary for a person's identity to be verified by a face to face meeting with the nominated Registration Authority. NHS Connecting for Health has also applied the e-GIF technical policies and specifications governing information flows across and between the different suppliers to provide assurance of security across the systems.

24 BMA Press Release November 2004. Information Technology: NHS National Programme for IT. The BMA represents doctors from all branches of medicine all over the UK. It is a voluntary professional association of doctors, an independent trade union, and a scientific and educational body. It has 137,000 members.
25 The Joint GP IT Committee is jointly chaired by the British Medical Association and the Royal College of GPs and represents their members on IT matters involving GPs.
26 The e-Government Interoperability Framework sets out the government's technical policies and specifications for achieving interoperability and Information and Communication Technology systems coherence across the public sector.

2.21 In respect of the Programme, access will be controlled in three ways:

a **User authentication.** A Smartcard and pin number (two factor authentication) must be used every time an NHS employee logs onto the systems. They will together uniquely identify the individual and enable their credentials to be verified against a national database of valid users.

b **Rôle based access control.** Anyone accessing a patient's record will have access to only as much information as they need to know for the purpose of the job rôle they are performing. NHS Connecting for Health expects to define some 280 rôles centrally which will be assigned to individuals by local NHS bodies.

c **Legitimate relationships.** Anyone accessing a patient's record is required to have a "legitimate relationship" with that patient, so a clinician will not normally be allowed to access the record of a patient not under their care.

2.22 A key issue for security will be ensuring that those working in the NHS understand and apply good security practices in their work. By April 2006, 208,990 users had been registered, had their credentials and identities confirmed in accordance with e-GIF Level 3 and had been issued with a Smartcard. Each day, some 45,000 users access the NHS Care Records System. Problems arise if the established procedures (set out in the paragraph above) are not followed. By April 2006, one instance has been identified where a temporary member of staff, whose employment was terminated, did not comply with the registration procedures, as shown in **Figure 6**, though no breach of patient confidentiality occurred.

6 Potential risk to security of data

In May 2005 a small number of General Practitioners at two Essex Primary Care Trusts – Castle Point and Rochford PCT and Southend PCT – were issued with Smartcards with a label showing their unique passcode number. Following an internal inquiry by Essex Strategic Health Authority, local procedures have been tightened. Users are now required to change the passcode immediately on receipt of their Smartcard, and to confirm in writing that this has been done. Nationally, NHS Connecting for Health has initiated a "confidence check" across all Strategic Health Authorities to re-emphasise the importance of adhering strictly to Smartcard registration procedures.

Source: Hansard. Parliamentary Answer on behalf of the Secretary of State for Health, 21 July 2005

PART THREE

Procuring and delivering the systems

NHS Connecting for Health ensured there was vigorous competition for the contracts, and maintained this competition after the contracts were awarded

3.1 NHS Connecting for Health took steps to ensure vigorous competition for the contracts. This included bundling of services to ensure the contracts were of sufficient magnitude, ensuring clarity with bidders and keeping to a succinct timetable to maintain the ability of the private sector to compete. The procurement strategy was published and adhered to. For the eight main contracts,[27] there were 160 responses to the notice published in the Official Journal of the European Union which signified the start of the competitive process. The number of suppliers was reduced as each procurement stage progressed. NHS Connecting for Health maintained competitive tension by negotiating contracts with at least two final bidders before selecting a winner, dispensing with the preferred bidder stage, which can cause a competitor to lose interest. Through the use of standard financial model templates NHS Connecting for Health could make like for like comparisons of bids, and identify where bidders could reduce their prices by reducing costs, allowances for risk or by reducing profit margins to a reasonable level. This analysis helped NHS Connecting for Health achieve significant price reductions from the eight prime contractors, the difference between their initial and final bids totalling £6.8 billion, and will strengthen its position when negotiating future changes to the contracts.

3.2 In a report commissioned by NHS Connecting for Health, the independent IT industry analyst Ovum compared the prices achieved by NHS Connecting for Health with estimates of the prices that could have been achieved by individual NHS organisations purchasing the same services separately. On this basis, it estimated a saving of some £4.5 billion from central procurement by NHS Connecting for Health.[28]

3.3 Where the winning prime suppliers were going to use the same subcontractors, NHS Connecting for Health used its buying power to negotiate significant price reductions from the subcontractors. NHS Connecting for Health has also used its buying power to negotiate significant price reductions from other suppliers of IT to the NHS, for example Microsoft, which represents a better deal for their committed volume than the Office of Government Commerce secured for the public sector (on a non-commitment basis) as a whole. **(Figure 7 overleaf)**. Two other notable agreements negotiated by NHS Connecting for Health are with Novell (for open source software) which will save the NHS in England up to £75 million over three years, compared to previous arrangements,[29] and with Oracle which could save the NHS in England up to £100 million.[30] Altogether, savings from such agreements are expected to total £860 million over their life.

27 Choose and Book, the Spine, the New National Network (N3) and five Local Service Provider contracts.
28 Ovum report: http://www.connectingforhealth.nhs.uk/ovum/jan05.
29 NHS Connecting for Health. Press Notice, 2 December 2005.
30 National Programme for IT. Press Notice, 26 January 2004.

7 NHS IT and Microsoft

In November 2004 NHS Connecting for Health negotiated renewal of the Department's NHS-wide licence for Microsoft desktop products, which NHS Connecting for Health estimates will save £330 million over nine years with a firm commitment only for the first three years.

Microsoft agreed that the price paid by the NHS would continuously match the lowest it charged anywhere in the world. The agreed price for their committed volume was substantially lower than that previously negotiated by the Office of Government Commerce (on a non-commitment basis) on behalf of UK government users. Microsoft also committed to spend £40 million on developing an NHS user interface to help standardise healthcare applications for clinicians, increasing efficiency and reducing the risk of clinical error.

NHS Connecting for Health also considered open source solutions for NHS IT, but decided against doing so for two reasons:

- The NHS already had an installed base of over 500,000 Microsoft environments and users were familiar with Microsoft; and
- Open source solutions are not necessarily cheaper: they may be free to acquire but the total cost of ownership is material when ongoing support, maintenance and training for users are taken into account.

NHS Connecting for Health completed the procurement of the projects swiftly

3.4 All of the contracts were procured in under a year between February 2003 and February 2004 – and most were concluded within ten months. This compares to an average of 27 months for the procurement of a single major PFI project. Such a swift procurement has the advantage that bidders' costs are reduced and development and delivery can commence sooner, allowing benefits to be obtained earlier, as well as mitigating against technology obsolescence.

NHS Connecting for Health tested potential suppliers' ability to deliver

3.5 NHS Connecting for Health required the final bidders to undertake "Proof of Solution" tests in a simulated environment with end users, to show whether their systems could meet a number of scenarios devised by NHS Connecting for Health. NHS Connecting for Health also undertook due diligence on the winning bidders to establish their ability and capacity to deliver the contracts they were to be awarded.

The contracts include strong incentives to deliver – both carrot and stick

3.6 NHS Connecting for Health will not pay suppliers until services are proven to be delivered and working. The longer suppliers take to deliver, the longer it will be before they are paid. However, the contracts with the Local Service Providers allow advance payments to be made, in recognition of the substantial sums Local Service Providers will have to spend on system development before they begin being paid for deployments. This reduces the costs to the taxpayer because the government can borrow money more cheaply than the suppliers. The negotiated contracts allowed for some £241 million to be paid to contractors in 2004-05. As a result of delays in delivery of systems and following negotiation on contract change notices, £133 million was actually paid to contractors during 2004-05. In transferring financial and delivery risk to its prime suppliers, NHS Connecting for Health has made them responsible for finding alternative software suppliers if their original suppliers fail to deliver, but without increasing the price agreed with NHS Connecting for Health.

3.7 Suppliers can win back delay and performance deductions. Suppliers who miss key milestone dates must pay agreed amounts, *delay deductions*, into an escrow account on which interest is earned. For example, BT did not meet a number of milestones within Phase 1 Release 1 of the Spine and agreed to make a payment, without any admission of liability, into an escrow account. Suppliers can win these deductions back, if they meet specified service commencement dates, the amount they can win back decreasing the later they introduce the services after the specified commencement date. Subsequently BT recovered its funds. If delays are the fault of NHS Connecting for Health, caused by acts or omissions of other suppliers or outside of the effective control of the relevant supplier, they can claim *delay events*, which, if agreed or determined, will allow later delivery of services and, in some cases, payment of compensation to the affected supplier.

3.8 Suppliers who fail to meet agreed levels of service accrue *performance deductions*, and have to pay into an escrow account amounts depending on the severity of the performance failure and its repetition. If a supplier rectifies its failure for the following three months, the performance deductions are refunded, with interest. Otherwise NHS Connecting for Health is entitled to keep the money.

3.9 Parent company guarantees place the onus on suppliers to deliver. A parent company guarantee should lead the parent company of a supplier to the Programme to undertake sufficient due diligence to ensure that the subsidiary could deliver the project. It also gives the commissioning department confidence that the supplier has sufficient funding and resources to carry out its obligations under the contract. In accordance with Office of Government Commerce guidance, NHS Connecting for Health secured parent company guarantees from all its suppliers. These provide for suppliers to pay NHS Connecting for Health up to between £50 million and £500 million (depending on the contract) in the event of the supplier's default. Suppliers are further incentivised as their contracts can be terminated without compensation in the event of contractor default.

3.10 The contracts include strong value for money mechanisms. NHS Connecting for Health has put mechanisms in place to help ensure continuing value for money over the life of the contracts. The pricing of changes is tightly controlled, suppliers are required to ensure the technology is continuously improved within the original contract value and refreshed so that systems continue to meet the changing needs of the NHS throughout the contract periods; service performance and costs can be benchmarked and suppliers' prices reduced as a consequence; and NHS Connecting for Health shares in any profits which exceed defined amounts. All of these mechanisms are underpinned by open book accounting.

NHS Connecting for Health has taken an intrusive but supportive approach to the management of its suppliers

3.11 As well as transferring financial and delivery risk to its prime contractors, NHS Connecting for Health has taken positive action to ensure the contractors are managing their tasks well. Its intrusive but supportive approach to the management of its suppliers is not common in the public sector. This approach covers both the prime contractors, and the several hundred subcontractors working for them. The approach adopted by the then Lord Chancellor's Department with its LIBRA project is an example of a project where a Department failed to take decisive action where a supplier did not deliver what was required.[31]

NHS Connecting for Health can take remedial action if suppliers are failing to deliver

3.12 The key safeguards are:

- NHS Connecting for Health can step in and manage the supply chain if and when required.
- NHS Connecting for Health can audit the performance of suppliers.
- The Department owns the specially written software.
- Terminated contractors have to assist in transferring the service.

3.13 The following paragraphs illustrate the use made by NHS Connecting for Health of such safeguards to address deficiencies in suppliers' performance.

IDX was removed as the software supplier to the Southern Cluster

3.14 BT and Fujitsu were awarded their contracts at different times but both contracted to use IDX as their subcontractor to deliver the required software. NHS Connecting for Health then initiated and BT and Fujitsu agreed to develop a 'Common Solution Programme' which provided unified governance arrangements, that would ensure the application was developed just once for the NHS in both the Southern Cluster and London Cluster. By mid-2004 NHS Connecting for Health was concerned about the effectiveness of the supplier management in relation to the performance of IDX. An audit and assessment of IDX capacity and capability was undertaken in January 2005 to satisfy all parties that the Local Service Providers' programmes could be met and to establish confidence going forward. However, by April 2005, even though NHS Connecting for Health had been applying increasing pressure to encourage IDX to deliver the Common Solution, insufficient progress had been demonstrated and Fujitsu lost confidence in IDX's ability to deliver the Common Solution project. Fujitsu requested that NHS Connecting for Health permit it to replace IDX with Cerner as its solution supplier. Fujitsu and BT agreed to dissolve the Common Solution project, and Fujitsu formally contracted with Cerner to replace IDX, no taxpayers' money having been paid to IDX. BT is continuing to use IDX for delivery of its core NHS Care Records Service solutions in the London Cluster. The replacement of IDX put Fujitsu some 18 months behind schedule for the delivery of the initial phases of the Programme; however it is planned that Fujitsu will have implemented the entire functionality by 2010 in accordance with the original contract agreement.

31 *Committee of Public Accounts,* New IT Systems for Magistrates' Courts: The LIBRA project *44th Report 2002-03* (HC 434).

NHS Connecting for Health sought to improve some prime contractors' management of their subcontractors

3.15 CSC, the Local Service Provider for the North West Cluster, agreed a remediation plan with NHS Connecting for Health for the delivery of Phase 1 Release 1 as it was having problems meeting the original target dates. The plan divided the phase into five subsidiary releases with revised deployment dates. Further delays led to a second remediation plan which pushed the deployment dates for two elements of Phase 1 Release 1 further back into 2006, some 19 to 22 months later than originally planned. The second plan was aimed at introducing an improved software solution delivery model for Phase 1 Release 2 and beyond, including steps to:

- Update and agree the strategic solution roadmap and associated interim deployments;
- Increase the development collaboration between CSC and iSOFT, including the co-location of CSC and iSOFT staff in the UK and India;
- Review functions, technical design, service management and financial and commercial issues; and
- Increase contractual focus on delivery and adherence to agreed schedules.

3.16 In early 2005, NHS Connecting for Health notified BT that it was in breach of its obligations under its contract as the London Cluster Local Service Provider but that it was prepared to allow BT time to consider how it could improve matters. NHS Connecting for Health was very disappointed with BT's proposals, and it therefore conducted an audit in August 2005 to identify improvements that could be made to BT's programme. The audit identified that BT had entered into a subcontract with IDX that meant that IDX was not incentivised or focused on the timely delivery of quality solutions. BT acknowledged that it had to address the issue. BT is seeking to revise its subcontract with IDX so that it is aligned with its contract with NHS Connecting for Health. Similarly to CSC and iSOFT, BT and IDX were also required to take steps to co-locate their respective organisations on this contract.

NHS Connecting for Health's intervention enabled targets for connections to the New National Network (N3) to be achieved three months early

3.17 NHS Connecting for Health's contract with BT set demanding targets for the delivery of the connections and data network services which make up the New National Network (N3) (see Figure 3). NHS Connecting for Health's aim is that N3 will provide a secure and resilient communications network across the NHS – a total of 18,000 sites – with sufficient capacity to enable efficient communication within and between NHS organisations. An important feature built into N3 is that as the volume of connections increases, the quality of each individual connection does not degrade.

3.18 Initially, the roll out of N3 encountered a number of problems – for example, BT failing to meet its early monthly (but non-contractual) targets for connections; poor communication about the scheduling of visits; complaints from customers at NHS sites that BT did not understand their requirements and about the quality of customer service received. It is accepted that BT encountered difficulty in gaining access to a small number of NHS sites and there were some local NHS co-operation issues. The combination of these factors led to a negotiated agreement for BT to pay £4.5 million as compensation for the increased cost to the NHS of maintaining the existing network prior to moving to the new N3 network.

3.19 These problems persisted during 2004. In early 2005, after pressure from NHS Connecting for Health BT agreed to provide forward communication in writing to both GPs and Primary Care Trusts about planned installations. Along with closer monitoring of BT's performance, BT undertook a series of major Cluster-wide communication events and accelerated connections of N3 to GPs at a rate beyond that contractually required. They doubled the rate of GP connections, meeting the target of 6,000 connections by the end of March 2005 despite the earlier delays. This improvement in performance has been maintained since: the target to achieve 12,000 connections by March 2006 was reached in December 2005, three months early, and by 3 April 2006, 14,130 connections had been made.

NHS Connecting for Health action led BT to improve its capability to deliver the Spine

3.20 Although the Spine first went live as planned on 29 June 2004, BT did not consistently meet the availability requirements of the contract in the early stages of deployment whilst user volumes were building up **(Figure 8)**. In February 2005 NHS Connecting for Health and BT jointly commissioned a review which confirmed that the overall technical architecture deployed by BT was sound and capable of supporting NHS Connecting for Health's requirements. The review, however, recommended a number of improvements. These included load testing, the use of Failure Mode and Effect Analysis,[32] more attention to data management throughout the lifecycle from design to migration, and a review of security architecture.

3.21 Following the review BT appointed a Managing Director for NHS Connecting for Health contracts, who quickly brought in additional highly experienced management and staff, and made organisational changes to enhance productivity, reduce rework, and increase efficiency. BT separated the application development roles from the operational support and service management roles and is seeking to implement development best practice through a disciplined acceptance and sign off process before products are made available to users.

3.22 Following these actions the availability of the Spine improved until Christmas 2005, when a major software upgrade of the Personal Demographics Service (PDS) caused significant availability issues during the last week of the year, and there were also some issues with the Choose and Book application that emerged. One of the systems used by GPs to manage their practices was a key contributor to the issues as it generated spurious messages that overwhelmed networks and server. NHS Connecting for Health considered that the PDS software upgrade was not fully tested before implementation. A subsequent report jointly commissioned by NHS Connecting for Health and BT highlighted the need for improved systems integration. The Spine has, however, met its availability targets in each month since December 2005. Overall Spine availability delivered in 2005 and 2006 compared to contracted service levels is shown in Figure 8.

The Spine

- **Holds records for almost all patients in England.**
- **Per day conducts:**
  - **375,000 patient traces**
  - **50,000 retrievals of patient demographic information**
  - **65,000 new or updated patient registrations with GPs.**
- **During March 2006, the Spine handled some 22 million messages, of which two million related to the Choose and Book service (the message volumes were double those handled during January 2006).**

Source: NHS Connecting for Health

8 Spine service level availability: Actual user minutes compared to contracted user minutes

Date	Total contracted user minutes (billions)	Total actual user minutes delivered (billions)	Percentage of contracted user minutes delivered
2005 Q1	6.250	6.250	100.00
2005 Q2	24.623	24.615	99.97
2005 Q3	62.195	62.367	100.28
2005 Q4	151.538	151.880	100.23
2006 Q1	297.455	298.198	100.25

Source: NHS Connecting for Health

NOTE
The contracted requirement was for the system to be available to users 99.8 per cent of the time up to March 2005 and 99.9 per cent of the time thereafter.

32 Failure Mode and Effect Analysis is an engineering quality method that helps to identify and counter weak points in the early conception phase of products and processes.

NHS Connecting for Health action led to an improved email and directory service system (known as NHSmail)

3.23 In 2002, the NHS Information Authority expected the use of email to increase sharply from the then 250,000 users to 100 per cent of NHS staff by December 2003. The then implementation of email was inefficient, with no national directory of staff as there were some 5,500 email servers in the NHS which offered no guaranteed national end-to-end service levels or service reporting. Actual service quality was variable between organisations and the overall perception and reputation of the local services was poor. These services were also not capable of being used securely to transfer patient identifiable data, a constraint not universally observed.

3.24 Following a competition, the NHS Information Authority awarded a contract to EDS to the value of £90 million to provide a national email and directory service in September 2002. Although not within its original set of responsibilities, NHS Connecting for Health took over management of the contract. This was terminated in March 2004. The settlement agreement reached between the parties was without admission by either party of liability on either side. EDS and NHS Connecting for Health worked together to prepare for and transfer supplier responsibilities from EDS to a new supplier.

3.25 After a competitive procurement, Cable & Wireless was awarded a contract in July 2004 to provide a new, national email and directory service (now called NHSmail). The contract is worth £50 million to £90 million over ten years, depending on the take up of users and additional services. It offers the following benefits over the previous arrangements:

- It is centrally funded and free to Trusts. Trusts that transfer their email services to NHSmail will therefore be able to release funds for other priorities; and
- NHS Connecting for Health estimates that a further £185 million would be saved through the decommissioning of local email services if half of NHS employees transferred to NHSmail.

3.26 Cable & Wireless successfully migrated 12 million emails and 90,000 accounts, of which 25,000 were active, to NHSmail at the end of October 2004. Although it did not achieve go live targets and availability targets between October 2004 and March 2005, which were not termination grade failures, by 3 April 2006, the number of registered users of NHSmail increased to 167,946 and the number of active users increased to 80,183. NHS Connecting for Health commenced active marketing of NHSmail in November 2005, through a campaign paid for by Cable & Wireless. It had also developed new software with increased functionality.

A wider choice of GP systems is planned for GPs

3.27 Until 2004, GPs provided their own IT systems and were reimbursed for some of the costs. When the NHS took over full financial responsibility for the provision of GP systems in 2004, GPs retained the right to a choice of systems under the General Medical Services (GMS) contract. In parallel with the GMS contract negotiations, NHS Connecting for Health required Local Service Providers to provide a system for GPs in their cluster. So, during the late stages of the NHS Connecting for Health procurements in 2003, as a direct result of the requirements of the GMS contract, the Local Service Provider requirements were changed to offer a choice of systems.

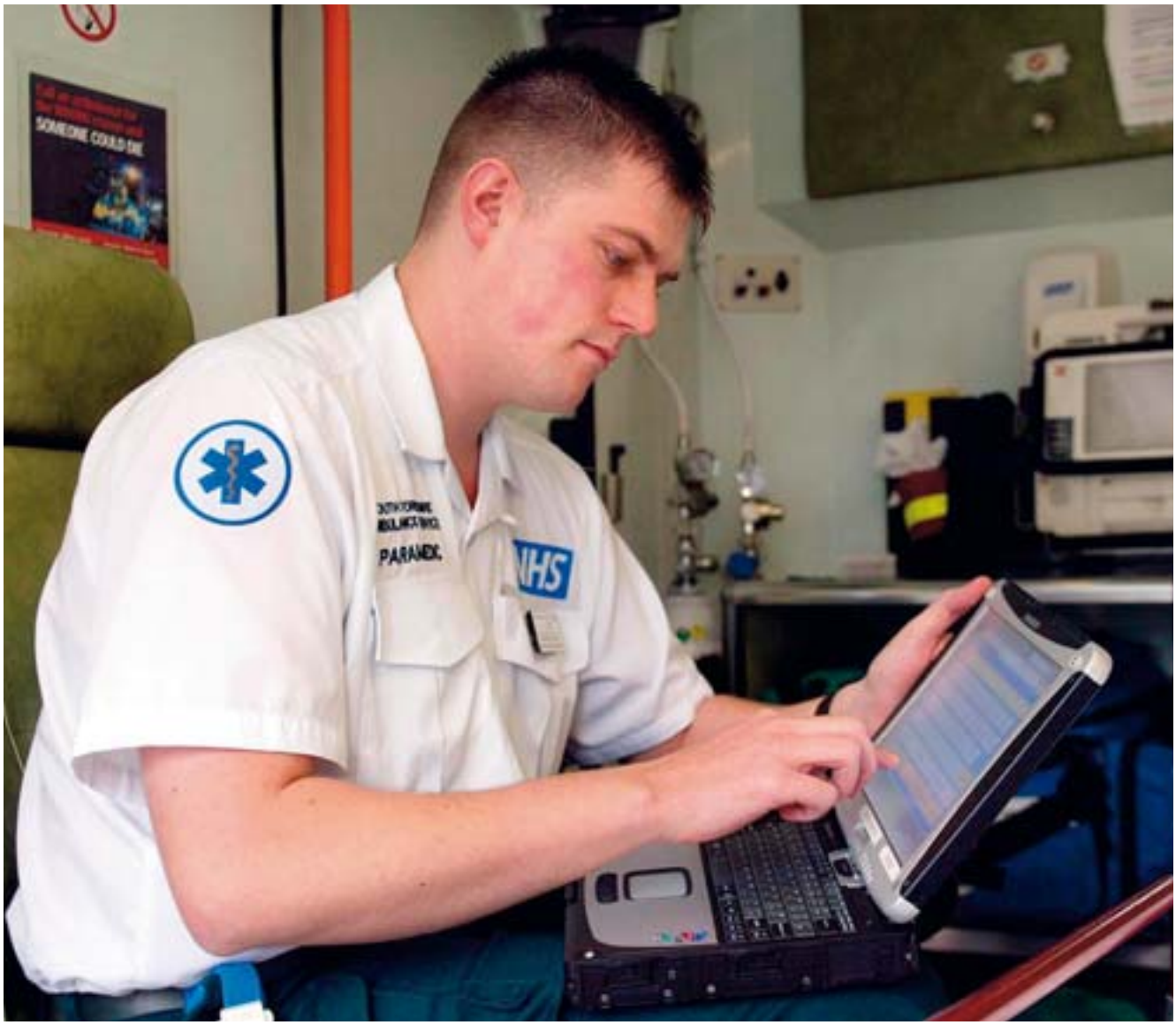
3.28 The Local Service Providers offered a choice of two systems within their proposals, as this limited the increased costs, and on this basis a contract was awarded. However, this choice was perceived by GPs to be too limited as it would have meant that most GPs would have to change their systems and there were demands that they should be

able to continue to use existing suppliers. In response to GPs' concerns, the Department of Health announced in March 2005 plans in principle to allow GPs to select from any GP system supplied by any Local Service Provider.[33] Then, in March 2006 the Department announced its GP Systems of Choice initiative, which enhanced the proposals made a year earlier by giving GPs a wider variety of options to choose from, by using the systems provided either by their Local Service Provider, or from an approved set of existing GP system providers. Subject to meeting agreed standards, GPs' systems will be funded either via Primary Care Trusts (for eligible existing systems) or via NHS Connecting for Health for systems provided by Local Service Providers. The Department is discussing the scheme with 12 suppliers, and the development and implementation of the scheme is subject to the successful conclusion of these discussions. These changes will have the effect of substantially increasing the choice available to GPs, and enabling those currently using systems from several existing suppliers to retain them.[34]

33 Department of Health. Press Release 2005/0136, 23 March 2005.
34 Department of Health. Press Release 2006/0105, 21 March 2006.

PART FOUR

Preparing to use the systems in the NHS



4.1 A key lesson from many unsuccessful IT projects in the past is that the NHS needs to see the Programme as a business change programme with clear goals and benefits rather than an IT project. Success therefore requires:

- Engagement of NHS managers and clinicians to win their support for the overall vision and purpose of the Programme and the benefits it will deliver.
- The NHS to articulate its business change priorities and users to shape their business processes accordingly.
- Commitment by the local NHS to install the IT systems and use them to improve services.
- Sufficient capability to implement effectively, including training the NHS staff that will use the systems.

The Department was aware that engagement of the wider NHS needed to be timed effectively alongside the procurement and implementation phases

4.2 *Delivering 21st Century IT,* published by the Department in June 2002,[35] set out the goals and aims of the Programme in the context of enabling the delivery of the NHS Plan. As indicated in Part 2, NHS Connecting for Health involved clinicians in the design of the Output Based Specification (OBS). As part of the national procurement exercise that followed, NHS Connecting for Health involved NHS users in the evaluation of competing IT suppliers. Otherwise, however, the Department and NHS Connecting for Health decided to conclude the bulk of procurement activities before focusing on communicating with and engaging NHS staff. Wider engagement and mobilisation of the NHS was not started until it was judged that procurement had reached a sufficient stage of maturity to be able to communicate its outcome in a meaningful and efficient way. It was concerned that to have done so earlier might have raised expectations which were either speculative or may not have been met. NHS Connecting for Health also faced severe resource constraints on undertaking such activities.

4.3 Mobilisation of the NHS on a wider scale began as the procurement phase concluded at the end of 2003. In each Cluster, one of the Chief Executives of the NHS Strategic Health Authorities (SHA) was appointed as the Senior Responsible Owner (SRO) for the implementation of the Programme. Cluster, SHA and local health community programmes were established and the Department allocated resources to SHAs to pump-prime local implementation activities through the network of local programmes. Through this network, many NHS staff were engaged in the delivery of the Programme locally. Clusters set up Clinical Advisory Groups to obtain clinical input on specific systems as they were being developed, which included medical, nursing and other clinical professions as well as IT managers and administrative staff. The London Cluster, for example, has developed its own Best Practice working groups to gain clinical input.

35 *Delivering 21st Century IT Support for the NHS. National Strategic Programme*, Department of Health, June 2002

4.4 In summer 2004, the Department reviewed the early progress and adopted an engagement and benefits strategy which reinforced the business change elements of the Programme. This also described the implementation model including the roles and responsibilities of the different parts of the organisation.

4.5 NHS Connecting for Health incentivised Local Service Providers to use NHS staff to enhance the usability and attractiveness of the systems to end users by making between seven and 15 per cent of suppliers' charges based on usage of the systems they have developed. We found that all the Local Service Providers are adopting a multidisciplinary approach, using medical, nursing, allied health professional, and non-medical staff in their clinical teams. They have also drawn upon clinical expertise from elsewhere in their organisations and from overseas.

National leadership of parts of the Programme has changed a number of times

4.6 At the inception of the Programme, the Department of Health's Director of Research, Analysis and Information was the Senior Responsible Owner for the Programme as a whole. In March 2004 he gave up this role, and the Director General for IT became one of two joint Senior Responsible Owners, with further Senior Responsible Owners responsible for individual components of the Programme. The Director General for IT and the Chief Operating Officer have been in post continuously since October 2002 and September 2003 respectively, and there has also been a high degree of stability in their team.

4.7 Because the Director General for IT had no management responsibility for NHS Trusts, he was never responsible for ensuring that the NHS's input to implementation and realising business benefits was delivered. In recognition of the importance of this aspect of the National Programme, the Department has made several appointments:

- From April 2004 until September 2004, the Deputy Chief Medical Officer held the post of Director General of Benefits Realisation, reporting to the Chief Medical Officer, and was designated as the other joint Senior Responsible Owner, responsible for clinical engagement and benefits realisation.
- In November 2004, the Chief Executive of Trent Strategic Health Authority was appointed as Director of IT Service Implementation, reporting to the Department of Health's Group Director of Health and Social Care Delivery. In May 2005, the then Chief Executive of West Yorkshire Strategic Health Authority took over from him.
- In April 2005, the Department of Health's Group Director of Health and Social Care Delivery was appointed as overall Senior Responsible Owner for the Programme. The Director General of IT remained Senior Responsible Owner for systems delivery.
- In April 2006, the Acting Chief Executive of the NHS took over as Senior Responsible Owner for the Programme as a whole, following the retirement of Sir Nigel Crisp, who held the combined post of Permanent Secretary and Chief Executive of the NHS.

NHS Connecting for Health has taken steps to inform future users and win their support

NHS Connecting for Health publishes extensive information on the Programme's progress and activities on its website

4.8 The Programme is the only major public sector IT project in the UK where the responsible body has a dedicated website to provide information on the progress of the project. Before 2004, when NHS Connecting for Health set up its own website,[36] it used the Department of Health website to publish the OBS and other documents about the Programme. Its own website provides information on what the Programme plans to deliver, details of activities in the five Clusters, clinical engagement, implementation guidance, training and development, and other general technical, operational and media information. Quarterly updates on progress are also published along with links to individual projects, and fortnightly forward looks of imminent deployments.

36 http://www.connectingforhealth.nhs.uk

Clinical Leads are making a contribution to winning the support of NHS staff

4.9 In November 2004, the then Director of IT Service Implementation appointed seven National Clinical Leads to champion four occupational groups in the NHS: GPs, hospital doctors, nurses, and allied health professionals **(Figure 9)**. The National Clinical Leads have engaged directly with national organisations through the National Advisory Group and demonstrated their influential role. For example, the GP Clinical Leads highlighted the demand from GPs for a wider choice of systems and facilitated the resolution of the issues around offering a wider choice of GP IT systems. The increased levels of dialogue fostered by the introduction of Clinical Leads were highlighted by the professional bodies we consulted as a positive development. This contrasted with the lack of consistency and leadership prior to the appointment of the National Clinical Leads.

There is support for what the Programme is seeking to achieve

4.10 NHS Connecting for Health commissioned independent research to track awareness and understanding of the Programme across the NHS. The survey, conducted by Ipsos MORI in July 2005, found that the majority of staff interviewed were positive about what the Programme was trying to achieve in the future **(Figure 10 overleaf)**. They also said that services provided by the Programme would help them in their daily working life **(Figure 11 overleaf)**, to share information about patients and improve patient care.

The NHS has more work to do on engagement

4.11 The Ipsos MORI survey also showed that one fifth knew a great deal about the Programme, just under half knew a fair amount and three in ten knew nothing. One in seven of the latter (ie four per cent of the total) had not heard of it. **Figure 12 on page 47** shows that within the staff groups, awareness was lowest amongst doctors, nurses and allied health professionals, and highest amongst IT managers.

9 National Clinical Leads

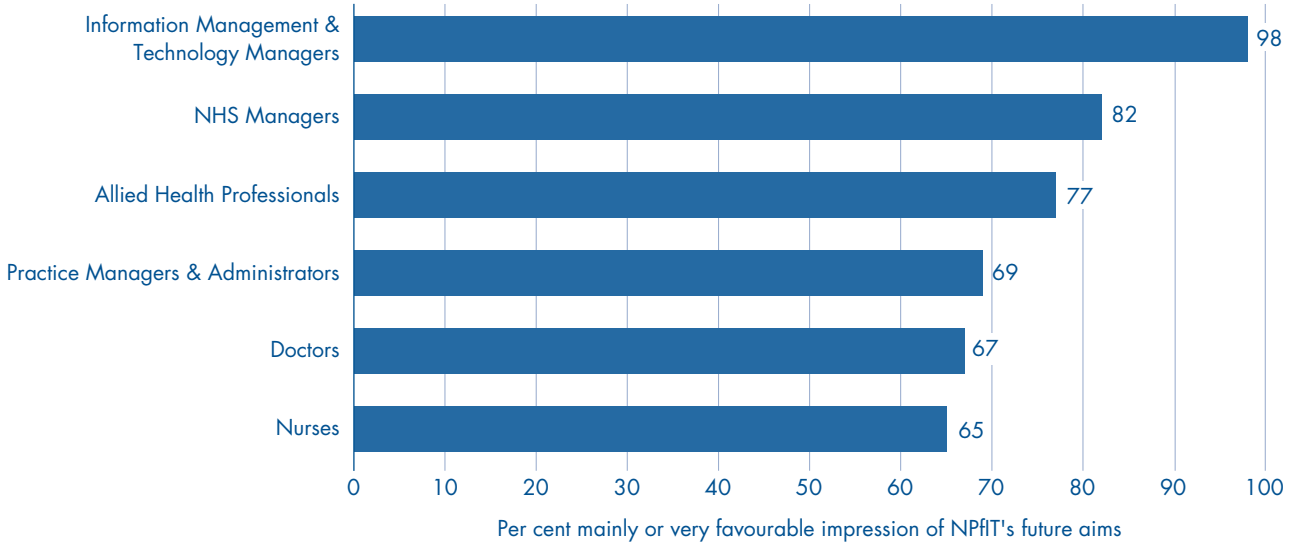
- Each lead is a well known member of their profession with credibility among practising clinicians;
- Leads have been instrumental in setting up and chairing three clinical advisory groups – covering doctors, nurses and allied health professionals – which are a forum for dialogue between NHS Connecting for Health and health care professionals, the Royal colleges, professional societies and associations; and
- Leads have assisted the Care Record Development Board in determining the content and tackling issues surrounding the care record, for example at the CRDB November 2005 Annual Conference.

Source: National Audit Office examination

4.12 The Ipsos MORI survey found that 14 per cent of NHS staff interviewed received information about the Programme from specialist publications and five per cent from national and local media. The staff survey showed that the NHS organisation for which people work is their most common source of information about the Programme (with 39 per cent of respondents currently receiving information about the Programme from this source). Importantly, the staff survey showed that they want more information from their own organisation about the Programme rather than receiving communication from the centre. There is a risk that negative reporting about the Programme and its progress will tend to increase the level of NHS staff scepticism about the Programme. On average, between August 2004 and December 2005, 73 per cent of press coverage has been positive or neutral and 27 per cent has been negative. The poor record of the NHS in implementing IT systems prior to the Programme has not helped NHS Connecting for Health in improving the image of the Programme in the media.

10 NHS staff have a favourable opinion of the Programme's future aims

How favourable or unfavourable is your overall opinion of what the Programme is trying to achieve in the future?



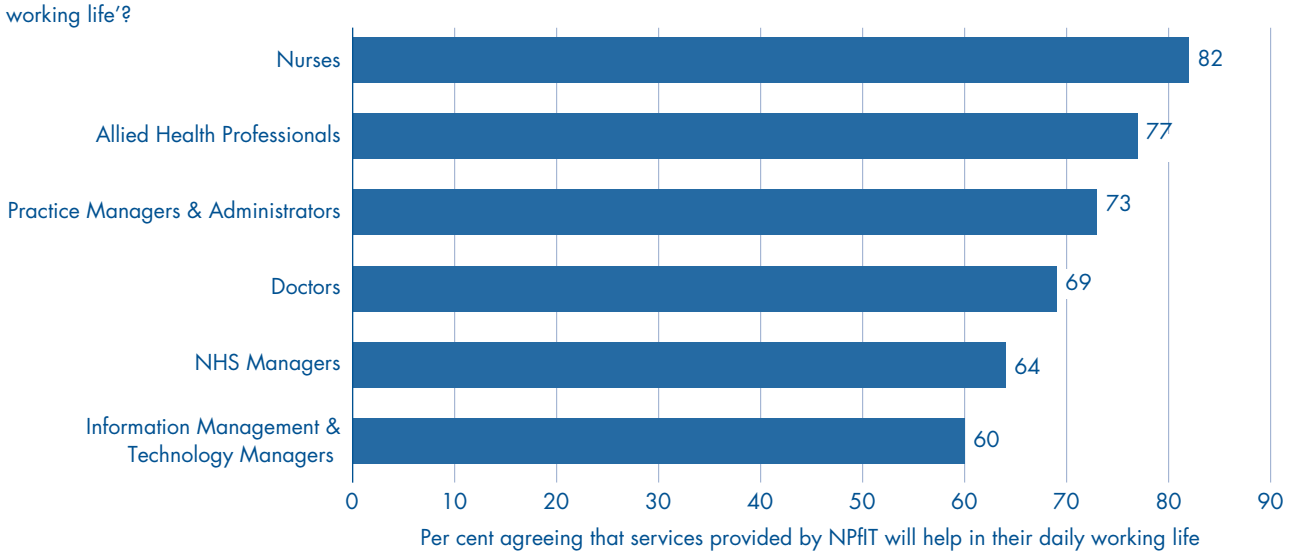
Source: Ipsos MORI survey of NHS staff on behalf of NHS Connecting for Health, June-July 2005

NOTE

Base: All who have at least heard of NPfIT: Doctors (172); Nurses (162); AHPs (177); NHS Managers (190); IM&T Managers (179); Practice Managers & Administration (164).

11 NHS staff consider the Programme will help them in their daily working life

Please could you tell me to what extent you agree or disagree that 'Services provided by the Programme will help me in my daily working life'?



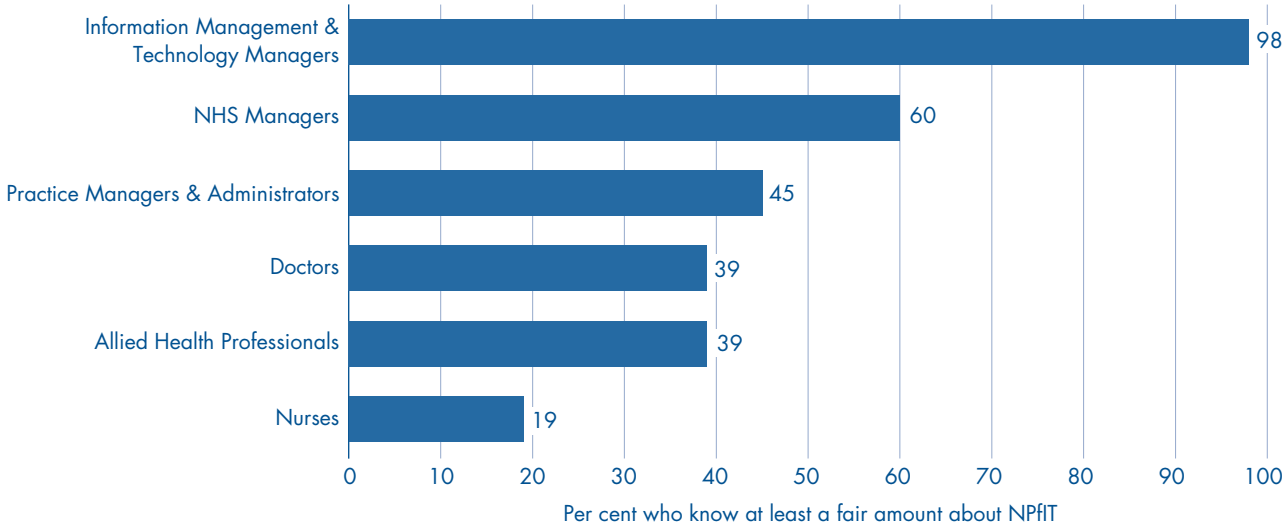
Source: Ipsos MORI survey of NHS staff on behalf of NHS Connecting for Health, June-July 2005

NOTE

Base: All Doctors (206); Nurses (229); AHPs (205); NHS Managers (202); IM&T Managers (179); Practice Managers & Administration (202).

12 Front line staff are least familiar with the National Programme

Please could you tell me how familiar, if at all, you are with the National Programme for IT?



Source: Ipsos MORI survey of NHS staff on behalf of NHS Connecting for Health, June-July 2005

NOTE

Base: All Doctors (206); Nurses (229); AHPs (205); NHS Managers (202); IM&T Managers (179); Practice Managers & Administration (202).

4.13 Another source suggests that the NHS has more work to do to gain the commitment of doctors. In its latest survey of GPs and hospital doctors conducted over mid-December 2005/January 2006, Medix[37] found that 59 per cent of GPs and 66 per cent of other doctors responding said that clinical care in the longer term would be improved by the Programme. However, support for the Programme had fallen: 26 per cent of GPs and 45 per cent of other doctors responding were enthusiastic about the Programme compared to 56 per cent and 75 per cent respectively two years earlier. The survey also found that 56 per cent of doctors responding had little or no information about the Programme, including six per cent for whom the survey was the first they had heard of it with four per cent saying they had a lot of information, compared to one per cent three years ago. NHS Connecting for Health told us, however, that it believed that the results of these surveys should be treated with caution, because the respondents are drawn from self-selected subscribers.

37 Medix is a profit making independent company, funded by revenues and investors. Its revenues come largely from sponsorship of the questionnaires completed by its members. It conducts surveys sponsored by organisations wishing to find out the views of medical practitioners. Its members respond to interactive questionnaires in return for remuneration and awards. This survey was commissioned by *bjhc&im, Computer Weekly, e-health insider, GP, Hospital Doctor, the Guardian* and the *Financial Times* to investigate the views of doctors about the National Programme. It was the sixth survey Medix has carried out on this subject, starting from February 2003. 1,329 doctors responded to the survey, 1.5 per cent of practising doctors in England across a range of specialties.

A minority of those working in the NHS are unfavourable towards the Programme so far

4.14 The Ipsos MORI survey found that a minority of NHS staff interviewed (ranging from 12 per cent of nurses to 32 per cent of doctors) are currently unfavourable towards the Programme so far. According to the Ipsos MORI survey, common reasons for the unfavourable impression of the Programme so far are that it is moving slower than expected and that implementation dates are not being met. Two professional bodies we spoke to commented that information on updates or deployment plans had often been unreliable, with deployment slippages reported to be a common experience, which they consider has dented enthusiasm for the Programme.[38] In its report, Ipsos MORI considered that one of the key challenges NHS Connecting for Health faces, therefore, lies in convincing NHS staff that the Programme is moving closer to achieving its goals and increasing the proportion of staff who feel favourable towards the Programme at any given time.[39]

4.15 NHS Connecting for Health's view is that greater familiarity with the Programme's services will increase confidence as doctors become more familiar with the new technology, receive further information and see that the systems raise standards.

NHS staff considered the biggest barrier to implementation was staff knowledge and training

4.16 The Ipsos MORI survey showed that respondents considered that the biggest barrier to implementing the Programme was lack of staff knowledge and staff training. The majority of the NHS's 1.3 million staff will need training to use the Programme's systems, and NHS IT professionals will be needed to implement the systems locally in conjunction with the Local Service Providers.

4.17 NHS Connecting for Health's strategy requires suppliers to develop IT training to "train the trainers" and then to harness the training and development resources and skills of the local NHS to deliver training in the workplace. Local Service Providers are incentivised to provide effective training of trainers and support for staff to work and use the new systems by being paid, in some part, on usage of the systems they are delivering (paragraph 4.5).

4.18 NHS Connecting for Health is aware of the importance of effective communications with staff. Although direct responsibility lies with local NHS units, NHS Connecting for Health provides a comprehensive website and publishes numerous leaflets as well as comprehensive information packs for local use.

NHS Connecting for Health has a programme to keep the public informed about the development and deployment of the NHS Care Records Service

4.19 In January 2005, NHS Connecting for Health appointed Porter Novelli, a public relations company, to support the ongoing need to keep the public informed about the development of the NHS Care Records Service and the new ways of accessing the patient information that it will offer. The campaign has three stages:

a The first stage was launched by NHS Connecting for Health in September 2005, working with Strategic Health Authorities and Trusts to distribute films, posters and an information booklet to every NHS employee. Over one million items were distributed in this phase of the campaign.

b The second stage, during 2006, provides more detailed information showing how the Care Records Service will benefit GPs, hospital doctors, clerical workers, allied health professionals, nurses and other NHS staff. The associated materials are being developed jointly with interested bodies such as the Medical Royal Colleges.

c The third stage, planned for 2006, is designed to reach every member of the public in England. It will include a programme of roadshows to regional centres and a summary leaflet to be sent to 21 million households. The campaign, which has local and national elements, will explain to patients the benefits and choices available on sharing or withholding medical information and promote awareness of the potential benefits and risks from the introduction of the services.

38 The British Medical Association, the NHS Alliance.
39 *MORI survey of NHS staff on behalf of NHS Connecting for Health, June-July 2005, page 35.*

The Department is strengthening its systems for monitoring and managing performance to help deliver the Programme

4.20 There have been problems in getting GPs to use Choose and Book and delays in Trusts on the production of business cases for PACS. The Department has made commitments to suppliers on the volume of implementations by the NHS and delays may lead to financial penalties. The only element of the Programme that has featured significantly in the Department's system for monitoring and managing NHS performance to date has been Choose and Book. Building on the management structures first outlined in *Delivering 21st Century IT*, the Department has therefore decided to use its performance management regime, which has a record of success in securing local achievement of key national NHS targets, to support local implementation of the Programme. It will set specific Programme-related targets for NHS managers and will monitor progress, and hold managers to account where targets are missed.

4.21 In June 2005, the Department issued a letter to all SHA Chief Executives instructing them to establish Integrated Service Improvement Programmes (ISIP). (ISIP uses OGC's Managing Successful Projects™ methodology to support its framework). These will bring together benefits and improvements resulting from all the different initiatives and programmes including the National Programme for IT. Local health communities were required to develop an integrated service improvement programme by March 2006, in preparation for the measurement and delivery of benefits from 2006-07 onwards.

4.22 The Department is emphasising to Strategic Health Authorities and all Primary Care and NHS Trusts that it considers implementation and use of Programme outputs to be one of their key priorities. The new SHA and PCT Chief Executive Officers will be the Senior Responsible Owners for the implementation of the Programme in their areas. This places accountability for the implementation of the Programme with the individuals best placed to manage the overall task and aligns it with their accountabilities for other functions, and strengthens the Programme governance structure for delivery and implementation.

4.23 Trusts often use staff taken from clinical duties to carry out project management functions because of the value of drawing on their clinical experience. NHS Connecting for Health recognises that the difficulty of finding suitably experienced project management staff to support delivery of the Programme will be exacerbated as deployments increase and greater numbers of staff with benefits realisation or project management skills are needed.

APPENDIX ONE

Methodology

Aspect	Methodology – how we examined
1 Developing a concept for what the systems should do	
Whether the Programme's vision is soundly based	i Review of the business case and prospectus of the architecture of the Programme and how the expected benefits will be delivered. Note: Our review did not consider the technical architecture and design of the Programme. In April 2006, 23 leading IT academics, in an open letter to the House of Commons Health Select Committee, called for an independent technical audit of the Programme. At a meeting six of the 23 signatories and NHS Connecting for Health expressed their agreement with and support for the overall goals of the Programme. There was agreement that a constructive and pragmatic independent review of the Programme could be valuable. On 24 May the Minister of State for Public Health announced that the Department had no current plans to commission an independent audit of the Programme, commenting on the other forms of review already underway and saying that the Department remained confident that the technical architecture of the Programme was appropriate. ii Identified lessons learned from current NHS systems and how the Programme has incorporated these lessons. iii Reviewed evidence of changes to scope from contracts awarded.
2 Whether the National Programme is on course to deliver the systems	
Whether a The contracts are likely to deliver value for money b The systems are being delivered	i Interviews with all the major suppliers contracted to deliver systems to understand market capacity and their capability to deliver. We also examined NHS Connecting for Health documentation, for example for details of due diligence prior to contract award. ii Examination of documentation from the Programme to determine starting bids and final agreed prices and terms and conditions. iii Examination of incentives to deliver in contracts and interviews with suppliers. iv Examination of NHS Connecting for Health management information and contracts to assess progress against business plans; whether contractors and the Programme are hitting milestones; and details of delay events. v Interviews with Programme staff and suppliers to determine how risks to value for money are addressed in the longer term, for example benchmarking of service prices, intellectual property rights.
3 Making the best use of systems that will be delivered	
The extent to which a Action is being taken to realise benefits enabled by the systems b NHS managers and staff are likely to take advantage of the Programme	i Interviews with Regional Implementation Directors (RIDs) and Clinical Engagement Directors in the five Clusters to identify: (a) how the Programme is being implemented locally, NHS training, IT manpower and organisational buy-in; and (b) RIDs' role in gaining the engagement, commitment and support of senior NHS officials in the Programme. ii Identifying examples from Clusters of how NHS staff have been involved in the design and development of software to be used by staff. iii Analysis of Regional Implementation Plans to identify arrangements in place to realise expected benefits and examples of benefits.

Aspect *continued*	Methodology – how we examined *continued*
3 Making the best use of systems that will be delivered *continued*	
	iv Review of the results of a survey of six NHS staff groups undertaken by Ipsos MORI between 22 June and 25 July 2005, commissioned by NHS Connecting for Health, to track understanding and awareness of services delivered by the Programme across the NHS. Interviews were conducted with the following staff groups: Doctors (206); Nurses (229); Allied Health Professionals (205); NHS Managers (202); IM&T Managers (179); Practice Managers & Administration (202).
	v Interviews with key representative bodies – Academy of Medical Royal Colleges, Royal College of General Practitioners, Nursing and Midwifery Council, British Medical Association, Royal College of Nursing, NHS Confederation, NHS Alliance, Unison and the Public and Commercial Services Union – to assess buy-in.
	vi Interviews with Programme and Department of Health staff and examination of documentation on Programme Boards in each Cluster to identify: (a) structures in place to generate engagement; and (b) how the Programme is being communicated.
	vii Interviews with National Clinical Leads about their role and the action they are taking to promote the Programme.
	viii Review of survey results from Medix to assess the awareness of and extent of communication about the Programme
	ix Discussions with other interested parties – British Computer Society, the Worshipful Company of Information Technologists, and Intellect.
	x Reviewing Programme and Department of Health data on costs of transferring from existing systems and the costs of non-contract Programme expenditure, such as infrastructure and local training.
	xi Visited two early roll-out sites to identify examples of what the Programme is delivering in practice.
4 Development of appropriate structures and infrastructure	
Whether a Project management is fit for purpose b Governance arrangements are adequate c Relationships between the Programme, the NHS and contractors are working d Budgets are available, controlled and monitored	i We commissioned QinetiQ to review Programme arrangements for project management and governance processes using the ISO 15288 international standard for systems engineering for the assessment of complex systems. This led to an appraisal of the management processes and practices in place for the National Programme against the international standard. (The QinetiQ report is published on the National Audit Office website at www.nao.org.uk.) ii Interviews with NHS Connecting for Health officials in key positions. iii Examination of: (a) Programme; and (b) NHS arrangements for determining, monitoring and control of overall costs.

Aspect *continued*	Methodology – how we examined *continued*
5 Delivery of required training	
The extent to which a Training requirements have been assessed b Resources are available c Progress is being made	i Interviews with Departmental and NHS Connecting for Health officials to identify plans in place at national level to train those expected to use the new services and technologies. ii Interviews with RIDs to identify training plans in place at regional level. iii Review of documentation on training required, resources needed, and plans in place to deliver training.
6 Recruitment and retention of manpower	
Whether staff numbers and skills are sufficient to deliver the Programme in a The NHS b Contractors and suppliers	i Consultation of NHS Connecting for Health and contractors about the capability of: (a) Local Service Provider staff; and (b) NHS IT staff to deliver the Programme. ii Review of documentation on skill levels needed to deliver training and whether sufficient trainers are being recruited.
7 Supporting and sustaining the new systems once they have been introduced	
Whether a There is an appropriate performance and deduction regime for contractors b There is provision for changes in requirements c The systems are secure and resilient	i Examination of the structure of contracts and interviews with suppliers to assess arrangements for continuing service quality and improvement once systems are in place, and for changes to specifications and service levels required by the Programme. ii Consulting National Audit Office IT experts about the robustness and security of the systems being developed.

APPENDIX TWO

Lessons learned from the procurement and management of the National Programme which may be of benefit to other departments

- **Speed.** A swift procurement process increases the likelihood of technology being up to date and benefits being delivered earlier. It also reduces overall bid costs for bidders and the costs of the procurement process.
- **Maintaining competition.** Negotiating contracts with more than one final bidder maintains a competitive tension between bidders and may offer further reductions in price.
- **Not having a preferred bidder stage.** This avoids the risk of prices creeping up once suppliers know that competitive pressure has eased.
- **Use of templates for financial models.** Requiring bidders to complete a template demonstrating their financial model can assist the contracting authority in comparing bids on a like for like basis and identifying where bidders could reduce their prices.
- **The principle of 'payment for systems that are delivered and working'.** This incentivises delivery and reduces the risk of the taxpayer having to pay for unsatisfactory services.
- **Intrusive management of the supply chain.** The contracting authority can rectify problems with delivery by stepping in to the supply chain in the event that suppliers are failing to deliver. Suppliers can be required to replace underperforming subcontractors.
- **Acting promptly to address problems.** Tight monitoring of performance and robust dialogue with suppliers provide early indicators of where the contracting authority needs to take action.
- **Applying tight change control mechanisms.** Change control mechanisms help to ensure that the changing needs of the NHS can be met and also to prevent suppliers charging excessive prices for changes.
- **Ownership of software and transition requirements.** In the event of a new supplier taking over a contract, the contracting authority retains ownership of software developed, and suppliers must assist in transferring responsibilities for services to a new supplier.
- **Publishing information about progress.** Having a dedicated website with project activities, information about service levels, data and forward looks of deployment activity can help provide transparent information to future users about the progress of the project.
- **Maintaining continuity of leadership.** Continuity has helped with work on the IT system, and its absence has hindered securing NHS organisation and staff engagement.
- **Engagement of users and user organisations.** Early involvement of users and user organisations helps to ensure broad support for change and increases the likelihood of successful implementation. Transparent communication about progress between system developers, implementers and service users is vital to maintain users' confidence in what is being delivered.
- **Working with existing systems.** Introducing new systems alongside existing ones adds an extra level of complexity that needs to be planned for, especially when there is little standardisation among the existing systems.

Source: National Audit Office examination

APPENDIX THREE

Matters raised in correspondence with the National Audit Office

During the course of our examination the National Audit Office received a wide range of correspondence concerning the National Programme from the media, academics, clinicians, IT specialists, suppliers and from seven Members of Parliament. The correspondence covered a variety of themes and issues which are set out in this Appendix (some correspondents raised a number of issues).

Theme	Matter raised
1 **The overall vision for the National Programme and strategy for implementation**	The overall vision for computerising the NHS. Peer review of the vision, rationale and requirements of the Programme. Lessons learned about the overall vision and engagement from other countries and from past projects. The risks and generic problems associated with previous large government IT projects and how these have been addressed. Appropriateness of patient choice, imposition of a top-down system, lack of clinical engagement, and patient consent for maintaining data on computer. Engagement and buy-in by the end users, i.e. clinicians. The priority given to implementation in the Programme's management. The technical viability of the Programme. The time required for completion of the Programme.
2 **The overall costs and benefits of the National Programme**	The overall costs and benefits of the Programme. The enforced replacement of existing, working, legacy systems. Budgets for implementation, the funding needed by Trusts, and possible overspend in implementation of the Programme.
3 **Consultation with the NHS and clinicians**	Consultation with doctors, and the need for business process redesign and alignment of business processes at the local level. Availability of robust data about clinicians' needs and priorities.
4 **Exclusion from the National Programme of key clinical systems**	Financial implication of services not included in the original specification, in particular pathology services.
5 **Other GP Systems**	The enforced replacement of GPs' computer systems, particularly EMIS, by centrally procured systems.
6 **Confidentiality and security of patient records**	The security and confidentiality of patient data held on a national system. Security and confidentiality of patient data and the Electronic Transfer of Prescriptions system.

Theme *continued*	Matter raised *continued*
7 Use of PACS	The selection of PACS suppliers, the specifications for PACS, and the use of PACS by NHS Trusts. Functionality and financial cost of the PACS solution developed by the Local Service Providers. Poor value for money re the implementation of PACS in the NHS by NHS Connecting for Health.
8 The assessment of the General Medical contract	The choice of accredited software for use in assessing outcomes for the new General Medical contract.
9 The contracting process	The monitoring and control over the contracting process and whether the selected product was appropriate. The contracting process, the involvement of Microsoft and the consideration of open sourcing. The software procurement and development processes and the use of consultants and advisors to implement and develop the Programme.

Source: Correspondence with the National Audit Office

APPENDIX FOUR

Extract from *Delivering 21st Century IT Support for the NHS*

Delivering 21st Century IT Support for the NHS – National Strategic Programme, published in June 2002 by the Department of Health, set out the following phases for the National Programme:

Phase 0 – April 2002 to March 2003 – Firm scope

Infrastructure

- Define data standards
- Define interchange standards
- 100 per cent of consultants with PCs

Application Services

- Create first stage of National Health Record Service
- Agree XML based EPR System Specification, using open standards

Implementation and Support

- Work with OGC and e-Envoy to streamline procurement
- Begin increase of NHS IT capacity and capability

Phase 1 – April 2003 to December 2005 – Firm scope

Infrastructure

- Broadband access (>128kbs) to every clinician and support staff in the NHS, increased bandwidth to minimum – 2Mbps between Trusts and across NHS Net Gateways
- Access and authentication available for all NHS staff, implementation of National NHS Directory Service
- Domain to domain encryption implemented

Application Services

- National Bookings Service, implemented
- National Prescriptions Service, 50 per cent implemented
- All PCTs, NHS Trusts actively implementing elements of EPRs
- Full National Health Record Service implemented, and accessible nationally for out of hours reference
- National Patient Record Analysis Service established for 100 per cent of NHS transactions
- Provision of e-learning materials through the NHS University

Quality Management

- Establishment of a Faculty of Health Informatics in the NHS University
- Implementation of Gateway procedures for Information and IT Projects

Implementation and Support

- National IT services portfolio established
- SHA investment plans accepted (and funding agreed) by National Programme Director

Phase 2 – January 2006 to December 2007 (Tentative scope)

Infrastructure

- Broadband access implemented at recommended access speeds across local and wide area networks in the NHS
- Secure access mechanisms (e.g. Smartcards) for all NHS staff

Application Services

- Full National Health Record Service, with core data and reference links to local EPR systems for full record access
- National Bookings Service, all patient appointments, implemented
- National Prescriptions Service, with full clinician and patient functionality, 100 per cent implemented
- EPR (compliant with new national standard, XML-based specification) systems implemented in all PCTs, all Hospitals
- Picture Archiving and Communications Systems for all acute Trusts
- Telemedicine established in all GP surgeries for ECG, skin disease
- Patient/Citizen Portal available via Internet, Digital TV, wireless devices
- Ambulance Telemonitoring implemented in 20 per cent of all emergency response vehicles
- Ambulance radio replacement
- Home Telemonitoring available in 20 per cent of homes requiring it
- Common clinical terms implemented for hospital and primary care
- National Knowledge Service fully established

Phase 3 – January 2008 to December 2010 (Tentative scope)

- Ambulance Telemonitoring implemented in 100 per cent of all emergency response vehicles
- Home Telemonitoring available in 100 per cent of homes requiring it
- Unified Health Record (with all appropriate social care information)