

Outline Audit Findings

National Programme for IT in the NHS

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Summary

- 1 The National Health Service (the NHS) depends on the successful handling of vast quantities of information to function effectively. The National Programme for Information Technology in the NHS (the Programme) is a ten year programme to use 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 National 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, IT support for patients choosing their hospital, and statistical research tools.
- 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 September 2002 by the Director General for NHS IT. In April 2005 this unit became an agency (not an Executive Agency) of the Department called NHS Connecting for Health¹.
- 3 The Programme is being delivered mainly through contracts negotiated by NHS Connecting for Health with IT service suppliers². Once systems have been developed by the suppliers, further action is needed to bring them into use, such as tailoring systems to meet local circumstances and training staff to use them. Four Local Service Providers are primarily responsible for organising this work, but much work is needed by local NHS organisations – Strategic Health Authorities, Primary Care Trusts, Acute Trusts and other providers working for the NHS, such as General Practitioners (GPs) and Pharmacists.
- 4 The Programme represents the largest single IT investment in the UK to date and it is important for the taxpayers and patients that this investment pays off. However, the Programme has attracted criticism from many sources, which, whatever the basis of this criticism, emphasises the need 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 likely 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). 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 approval and outturn to date. On the basis of our examination of the Programme, we conclude that:
- i. The Programme has the potential to generate substantial benefits for patients and the NHS. The Department has not sought to put a financial value on all of these benefits, nor to show that their value exceeds the cost of the Programme, because its main aim is to improve services rather than to reduce costs. The Treasury's guidance³ 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. Nonetheless, savings are expected, for example by using the NHS'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.
 - ii. The Programme has strong ministerial and senior management support and commitment. The Department and NHS Connecting for Health have put in place arrangements that will support the IT elements of the Programme. The implementation of the Programme does not feature in current Department of Health Public Service Agreement targets or supporting targets, but it is a key enabler for a number of Ministerial commitments.
 - iii. However, the Department was slow to demonstrate clear and effective leadership to engage NHS organisations and staff in implementing and making best use of the systems. Responsibility for this work was initially not clearly allocated, but it was given a higher profile with the appointment of National Clinical Leads in later 2004 and the introduction of stronger management arrangements during 2005.
 - iv. There is support amongst NHS staff for what the Programme is seeking to achieve, but also significant concerns: that the Programme is moving slower than expected, that transparency is lacking as to when systems will be delivered and what they will do, and that the confidentiality of patient information may be at risk. Relations with GPs have also been damaged by concerns that they will be forced to give up their existing IT systems.
 - v. NHS Connecting for Health secured vigorous competitions for the IT contracts, which were quickly concluded – the competitions began in February and June 2003 and all the contracts were signed between October 2003 and February 2004. NHS Connecting for Health bought the systems at a fixed competitive price with incentives for the suppliers to deliver to

³ The Green Book. Appraisal and Evaluation in Central Government. HM Treasury, 2004

- timetable, and with incentives to protect continued value for money over the life of the Programme.
- vi. By late 2005, some elements of the Programme had already been delivered, including some outside its original brief. These achievements included:
- The Quality Management and Analysis System (QMAS) to support the new contract for General Practitioners introduced in April 2004.
 - A new NHS wide directory and email system (Contact).
 - The first 12,000 connections of the 18,000 eventually planned for the new NHS broadband communications network N3.
 - Initial milestones for new systems to deliver Ministerial targets for choice and the electronic prescriptions service, and deployments of X-ray and other diagnostic images systems (PACS).
- vii. However, achievement of other milestones have 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 National Care Records Service and the advanced integrated hospital IT systems that are central to the long-term vision for the Programme will now be at least one year later than originally planned. In the Southern cluster delivery will be at least two years later than originally planned. Milestones for later phases of the Service have not yet been set.
 - Deployment of the Choose and Book system to support patient choice has been slower than planned as a result, amongst other things, of the time needed to resolve problems with interfaces with existing NHS systems. Deployment of the electronic prescriptions service and PACS have also gone more slowly than planned, although NHS Connecting for Health expects to achieve Ministerial targets for later stages of the deployment.
- viii. In May 2005 the Department published a 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.
- ix. At present, the total cost of the Programme over the ten years to 2013-2014 (at 2004 prices) is projected to be £13.4 billion, made up as follows:

- **£6.2 billion** by NHS Connecting for Health on the contracts let in 2003 and 2004 the figure that has consistently been stated by NHS Connecting for Health in its literature and announcements;
 - **£1.2 billion** by NHS Connecting for Health on additional services and renewing contracts that expire before the end of the ten year period to 2013-14;
 - **£2.6 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.
 - **£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. The Department takes the view that spending by local NHS organisations is provided for in current funding plans for trusts, but IT funding is not explicitly ring fenced. Money will only be available if trusts give IT spending priority over other demands on their budgets, and problems with affordability have delayed progress with the deployment of the X-ray images system, PACS.
- x. Up to the end of March 2005, actual expenditure has been lower than planned, with £260 million spent against expected expenditure of £699 million, reflecting the slower than planned delivery of some systems and contractual provisions that suppliers will only be paid once services are delivered and working.

Conclusions and Recommendations

6 The Department and NHS Connecting for Health have made substantial progress but successful implementation of the Programme 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 now deliver systems that meet the needs of the NHS, to agreed timescales, and without further slippage.
- Ensuring that NHS organisations can and do fully play their part in implementing the Programme systems.
- Winning the support of NHS staff and the public in making the best use of the systems to improve services.

- 7 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 confirm that it now has a robust engineering based timetable for delivery, which it is confident its suppliers are capable of achieving.
 - (b) NHS Connecting for Health, the Department and Strategic Health Authorities should then communicate to individual organisations and 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 to closely monitor suppliers' performance and be prepared to impose 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, improve the transparency of value for money being achieved through its implementation, and highlight where efficiency improvements are being made. In this way a clearer idea will become available as to whether the Programme is value for money.
 - (e) The Department and the NHS should evaluate the experience of NHS organisations that have recently introduced IT systems comparable to, but different from, those to be provided by the Programme, such as University College London Hospital NHS Foundation Trust⁴, to identify and quantify the service and efficiency improvements that such systems can deliver, and use the Service Improvement Plan process initiated in June 2005 to translate these findings into evidence-based targets for individual NHS organisations from 2006-07.

⁴ UCLH signed contracts for the provision of an electronic patient records system and for a Picture Archiving and Communications system in September 2003. This was prior to the agreement of the National Programme contract for the London Local Service Provider in December 2003.

- (f) The Department, NHS organisations and NHS Connecting for Health should put in place training to strengthen the project management and IT skills available to the NHS, working 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.
 - (g) 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.
- 8 We also believe that there are a number of lessons to be drawn from the NHS Connecting for Health's experience so far and from other major IT projects. These lessons are set out in Appendix 2.

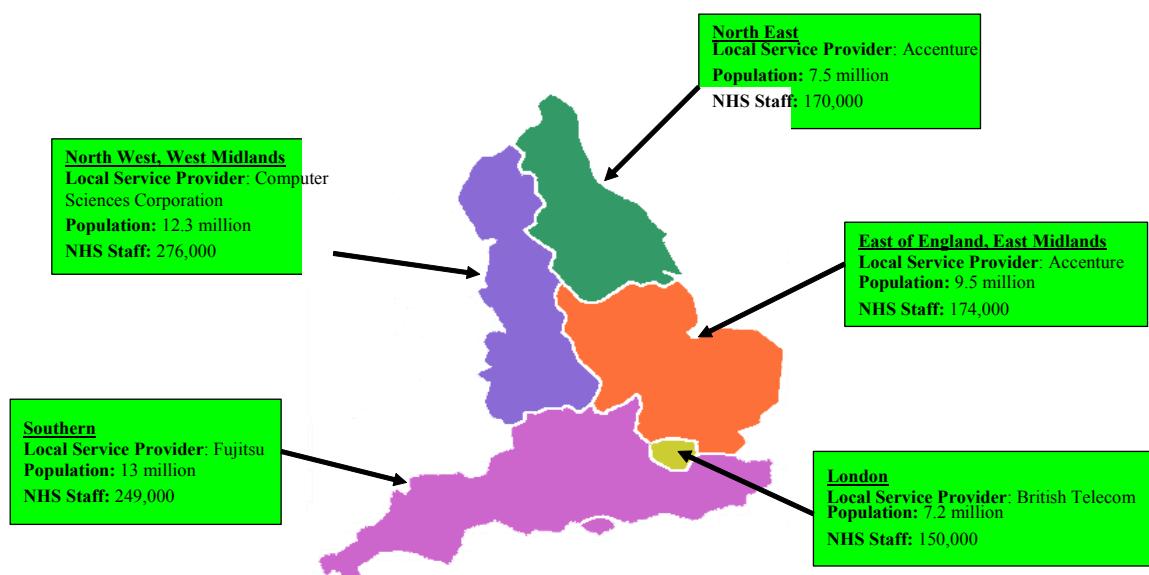
Part 1: What the Programme is and where it has reached

What the Programme is

1.1 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. 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 national infrastructure of secure high capacity digital links between NHS sites.
- Local Service Providers, providing services to local NHS bodies. There are four Local Service Providers, serving five Clusters of NHS organisations (Figure 1), one supplier (Accenture) having won contracts for two clusters.
- National systems, such as electronic transmission of prescriptions, delivered through the systems of the Local Service Providers.

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



1.2 NHS Connecting for Health's initial plan was for the National Care Record Service to be implemented in three phases sub-divided into five elements and to be delivered by the dates shown in Figure 2.

Figure 2: Initial phased deployment timetable

Phase 1 Release 1 – Development completed by June 2004, roll-out 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 Transfer 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 – 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 – 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 – 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: NAO analysis of NHS Connecting for Health Integrated Care Record Service Approvals to Proceed

1.3 The contracts with the suppliers broadly reflected these dates in Phase 1. For Phases 2 and 3 dates were not set in the contracts in the expectation that this would be done when work on Phase 1 was more advanced.

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

- Control access to all Programme systems - all users logging onto any systems need to do so through the Spine.
- Handle the transmission of information and messages between systems and NHS locations
- Hold the summary information on patients that form the core of the National Care Records Service.

1.5 Not all Programme systems need to use all of the functions of the Spine. However, all of them will depend on it to some degree, and progress on any individual system cannot go faster than progress on those parts of the Spine that it will use.

Where the Programme is now

(a) Progress

1.6 Figure 3 shows the main projects for which NHS Connecting for Health has responsibility, their progress to date and the estimated costs of delivery to 2013-14.

1.7 By 6 January 2006, a total of 8,063 deployments of systems had taken place across the five clusters. Deployments have mainly been of systems forming part of the Choose and Book system (6,698 systems), practice systems for GPs and a web based information system for hospitals called Map of Medicine. But they also include initial deployments of operational electronic transmission of prescriptions and 13 PACS systems. They also include 14 hospital patient administration systems, using currently available systems pending deployment of the main Local Service Providers' systems.

1.8 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. This has meant that LSP solutions need to be tailored to each organisation's requirements. These differences in requirements have meant that even after an LSP 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.

Figure 3: Principal Projects and Systems making up the Programme and managed by NHS Connecting for Health

Project	What it will do	Progress achieved				Cost (£ million at 2004-05 prices)	
		Procurement		Development and Deployment			
		OJEU notice issued	Contract Signed	Target	Position as at late 2005	Contracted cost	[REDACTED]
National Infrastructure							
<i>New National Network for the NHS (N3)</i> <i>Prime contractor- BT</i>	Provide a rapid, secure, robust, reliable broadband 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.	5 June 2003	19 February 2004	Contract set in-service targets of: - 6,000 sites connected by 31 March 2005 - 12,000 sites connected by 31 March 2006 - All 18,000 NHS sites connected by 31 March 2007	Target of 6,000 sites achieved by 31 March 2006 - By 6 January 2006, 12,978 connections had been made. The March 2006 target was achieved in December 2005, three months early. 86 per cent of GP practices had been connected.	£530m over 7 years	[REDACTED]
National Services							
<i>National Data Spine</i> <i>Prime contractor -BT</i>	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	P1R1 June 2004 P1R2 – December 2004 P2R1 – June 2005 Milestones for later stages to be set later	Parts of P1R1 went live 29 June 2004 as planned. BT did not meet a number of P1R1 milestones. The ready for deployment date for the remainder of the Spine was subsequently met some ten months later than planned, in April 2005. 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 re phased. The first four of the revised set of releases for 2005 have been completed to the revised target. For 2006 and 2007 the number of spine releases will be limited to two a year, which the local service providers could take together if they so wished. Further contractual go-live dates were agreed for 2006 and 2007: - Release 2006A: 10 March 2006 - Release 2006B: 1 Sept 2006 - Release 2007A: 9 March 2007 - Release 2007B: 23 Nov 2007	£620m over 9 years	[REDACTED]
<i>Choose and Book</i> <i>Prime contractor - Atos Origin</i>	Support patients' choice of hospital and enable booking of hospital appointments at a date, time and place convenient for patients. Additional services added to support patient choice, including the Booking Management Service, non contract deployment costs (GP Incentive scheme) and provision made to extend the contract to 2012.	9 February 2003	8 October 2003	Target for first booking June 2004. No further public targets were set out for Choose and Book, but business case projected that by March 2006, 90 per cent of bookings would be made through the choose and book system.	Software delivered on time. First booking achieved 2 July 2004. Since then, deployment has been slower than expected and at October 2005 was about a year behind schedule. By 6 January 2006 75,366 bookings had been made with 2,222 practices making at least one booking. 23,425 bookings had been made in November and 25,017 in December (approximately 3 per cent of bookings were being made through the system).	£64.5m over 5 years	[REDACTED]
<i>Contact – Email and Directory Service</i> <i>Prime contractor: Cable & Wireless</i>	Email and national directory service for all NHS staff, across all NHS organisations in England.	March 2004	1 July 2004	Service available for use – September 2004	Services developed and ready for go live – July 2004 By 6 January 2006 158,743 staff had registered and 72,781 were active users out of 1.3 million NHS staff.	£50-90m over 10 years	[REDACTED]
<i>Electronic Prescription Service</i>	Transfer prescriptions electronically from GPs and other prescribers to the chemist or pharmacist nominated by the patient and to the Prescription Pricing Authority.	-	-	Target for first deployment by February 2005 December 2005: 50 per cent of all prescriptions to be issued electronically. December 2007: 100 percent of prescriptions to be issued	First deployment met in – February 2005. By 6 January 2006 143 GP sites and 8 pharmacy sites were using EPS. Cumulative prescriptions issued electronically totalled 228,224. 65,376 prescriptions were issued in November and 65,932 in December.	Functionality provided by the Spine and Local Service Provider contracts.	

				electronically.			
<i>Picture Archiving and Communications Systems (PACS)</i>	Provide systems to capture, store, distribute and display static or moving digital medical images, such as X-rays.			In March 2004, a target was set of 33 deployments by December 2005 Full deployment of PACS by March 2007	By 6 January 2006, 13 PACS deployments had been made against the target of 33 deployments. (The number of PACS deployments for full deployment is 134).	£239m cost of central data store <i>plus</i> £775m to be paid for by local NHS	[REDACTED] [REDACTED]
<i>Quality Management and Analysis System</i>	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.	-	-	Phase 1 pilot August 2004 Full deployment January 2005	Working Solution delivered August 2004, with 6 releases delivered by March 2005, and 8298 GP practices covered by January 2005		
Local Services (Local Service Providers and main subcontractor)¹							
Responsible for: - providing and maintaining the local NHS Care Records Service - primary care and PACS functions - a detailed patient record consistent with the summary record held on the National Spine - electronic prescribing and a range of other functions	<i>North Eastern Cluster</i> Prime contractor: Accenture delivering the Lorenzo system developed by iSoft	7 February 2003	8 December 2003	P1R1 - June 2004 P1R2 – December 2004	Milestones for P1R1 revised, dividing P1R1 into four releases for delivery in October 2004. These milestones were achieved between October 2004 and August 2005. Subsequent deliveries are now delayed by around a year. By 6 January 2006 a total of 1,329 deployments had been made (of which 928 were Choose and Book deployments).	£1,099m over 9 years	[REDACTED]
	<i>London</i> Prime contractor: BT delivering Carecast system developed by IDX .	7 February 2003	9 December 2003	P1R1 – September 2004 P1R2 – March 2005	BT have not achieved any P1R1 milestones and are therefore at least a year behind schedule. By 6 January 2006 a total of 1,386 deployments had been made (of which 1,171 were Choose and Book deployments). In November 2005, some 8 months later than originally planned, BT deployed a patient administration system connected to the Spine, the first deployment of a system specifically written for the Programme.	£996m over 9 years	[REDACTED]
	<i>Eastern and East Midlands</i> Prime contractor: Accenture delivering the Lorenzo system developed by iSoft	7 February 2003	23 December 2003	P1R1 – August 2004 P1R2 – December 2004	Milestones for P1R1 revised, dividing P1R1 into four releases for delivery between August and October 2004. These were delivered between March and July 2005. Subsequent deliveries are now delayed by around a year. Some tactical deployments were made before the target date of December 2004. By 6 January 2006 a total of 1,670 deployments had been made (of which 1,119 were Choose and Book deployments).	£934m over 9 years	[REDACTED]
	<i>North West and West Midlands</i> Prime contractor: Computer Services Corporation (CSC) delivering the Lorenzo system developed by iSoft .	7 February 2003	23 December 2003	P1R1 – Jun 2004 P1R2 - December 2005	In April 2005, P1R1 was divided into five releases for delivery between June 2004 and September 2005. 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 between January and April 2006, some 19 to 22 months later than originally planned. By 6 January 2006 a total of 1,978 deployments had been made (of which 1,810 were Choose and Book deployments).	£973m over 9 years	[REDACTED]
	<i>Southern</i> Prime contractor: Fujitsu delivering the Millennium system developed by Cerner .	7 February 2003	26 January 2004	P1R1 – September 2004	In April 2005, Fujitsu appointed Cerner to replace IDX as its main sub contractor. P1R1 has been split into two phases, for delivery in December 2005 and August 2006, some two years later than originally planned. By 6 January 2006 a total of 1,700 deployments had been made (of which 1,670 were Choose and Book deployments).	£934m over 9 years	[REDACTED]

Note 1: prime contractors are supported by numerous subcontractors. This Figure shows only the main subcontractor for each LSP.

(b) Cost

1.9 Over the ten years to 2013-14, the cost of the Programme is currently projected as £13.4 billion (at 2004-5 prices)⁵, made up as follows:

- **£6.2 billion** on the contracts placed in 2003 and 2004 for the Department, the figure that has consistently been stated by NHS Connecting for Health in its literature and announcements;
- **£1.2 billion** on additional services and renewing contracts that expire before the end of the ten year period to 2013-14 (Figure 4);
- **£2.6 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.
- **£3.4 billion** in expenditure by NHS organisations to implement NHS Connecting for Health developed systems locally.

Central expenditure includes:

- Central set up and Management and implementation costs such as Technology office and central estate costs
- Activity on the National Programme: such as the help desk and the national Integration centre
- Other projects managed centrally by NHS Connecting for Health, such as Electronic Transfer of Prescriptions, PACS, Contact and Dentistry
- Additional services to deliver Choice to the NHS not being obtained through the contract with Atos Origin

Source: NHS Connecting for Health National Programme Board

Examples of expenditure by NHS organisations to implement the Programme locally:

- On Infrastructure such as desktop equipment, upgrading networks and connections,
- On other support such as procurement and contract management, additional staffing and support required, Ongoing training and training backfill and other technical support
- Local expenditure for implementing PACS

Source: NHS Connecting for Health National Programme Board

Figure 4: Projected contract costs to 2013-14 differ from original contract costs

The £1.2 billion in purchasing additional services and the estimated costs of contract renewals (some contracts expire before 2013-14) consists of:

- Estimated additional costs of £333 million to deliver the **New National Network (N3)** because the take up and capacity of the Network is now expected to be greater than initially predicted.
- Estimated additional costs of £481 million to deliver **Choose and Book**. Additional services to support the introduction of Patient Choice, including the Booking Management Service and other non contract deployment costs.
- Following the Department's decision in September 2004 to make the **Picture Archiving Communication Systems (PACS)** a core part of the National Programme, it was agreed that NHS Connecting for Health would bear the cost of central data stores required of £235 million.
- A net increase in the forecast costs of delivering the local service provider contracts of £98 million. The main increase is in the value of the contract for the **Southern Local Service Provider** which includes the purchase of additional services (£64

⁵ Including capital investment but excluding depreciation.

million) and losses of economies of scale (£62 million) following the dissolution of the Common Solution project.

Source: NHS Connecting for Health, National Audit Office

- 1.10 The Department takes the view that spending by local NHS organisations is provided for in current funding plans for trusts, but the Department does not centrally plan local NHS expenditure on IT or other costs associated with the Programme, such as training and staff costs. Accordingly, money will only be available if trusts give IT spending priority over other demands on their budgets, and problems with affordability have delayed progress with the deployment of PACS.
- 1.11 To determine current and planned spending on NHS IT, NHS Connecting for Health has instituted an annual survey of Trusts asking for data on actual and projected IT spend, both Programme related and non-Programme related. Its surveys show a trend of increasing spend on Information and Management Technology by NHS Trusts, rising to an estimated £1,200 million in 2005-06, 2.22 per cent of total NHS revenue spending (Figure 5). NHS Connecting for Health estimates that local NHS organisations will spend some £9.5 billion on IT over the next 10 years. This assumes that expenditure on the NHS will continue to increase beyond the end of the current spending review in 2007-08 through the addition of growth and as recommended by the Wanless Report⁶, and that local IT spending will also increase to maintain the same proportion of total local spending.

Figure 5: The survey carried out by NHS Connecting for Health shows spend on IT is increasing

	2002/03 Actual	2003/04 Actual	2004/05 Actual	2005/06 Budgeted
IT spend (£ million)	832	914	1,048	1,198
NHS Revenue (£ million)	41,468	45,027	49,328	53,925
IT spend as per cent of total	2.01	2.03	2.13	2.22

Note: The first annual survey was published in February 2005. The survey was completed by 94 per cent of the organisations questioned, and data were extrapolated to show the position across the whole NHS. A further survey was undertaken in July 2005.

Source: NHS Connecting for Health Programme Board minutes, January 2006

- 1.12 This suggests that planned spending on the Programme over the period to 2013-14 of £13.4 billion represents just over half (52 per cent) of the estimated total spending of £26 billion⁷ on NHS IT to 2013-14.

⁶ 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.

⁷ Including capital investment but excluding depreciation.

Part 2: Preparing to deliver the systems

The Programme is intended to enable the NHS to provide better patient care

- 2.1 The huge volume of contacts between the NHS and patients generates a huge volume of 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.
- 2.2 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, enabling sharing of information between a patient's carers across NHS organisations and specialities; 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 deliver benefits for NHS staff and help make the NHS more efficient, for example by reducing the time spent searching for paper records and repeatedly taking patients' medical histories.

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;
- 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

The Programme has Ministerial support

- 2.3 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 Programme⁸. 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).
- 2.4 In September 2002, the Department of Health appointed a Director General with experience of implementing large technology programmes in both the public and private sector. He recruited a programme management team drawn from the public and private sectors with the collective

⁸ *Delivering 21st Century IT support for the NHS*. Department of Health, June 2002

skills and experience he considered necessary to manage the procurement and delivery of the Programme.

- 2.5 The Department and NHS Connecting for Health made considerable efforts 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 Guide⁹, and documentation setting out the intended timeline and milestones for delivery of benefits¹⁰. However the Department has not sought to put a financial value on all of the benefits nor to show that their value exceeds the cost of the Programme, because its main aim is to improve services rather than reduce costs.

The Department chose to procure and manage the Programme centrally

- 2.6 The Department chose to centrally procure the Programme because the NHS has a poor record in delivering IT systems to improve patient care. In the past procurement and development of IT has been haphazard, leading to some 20,000 different IT systems 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. This approach is an obstacle to effective communication between the many healthcare professionals caring for the patient, and, therefore, an obstacle to patient centric care. The purchase and use of fewer types of systems is intended to promote standardisation, enable easier transfer of data, and contribute to the achievement of patient centric care. NHS Connecting for Health has also sought 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.

The Programme will be delivered in phases

- 2.7 Implementation and development will be phased in two senses:

- Local Service Providers will make systems available to NHS bodies in a series of releases, initially providing only some of the functions required, and building up to completion of the full national system by 2010.
- NHS bodies need not adopt the systems immediately on release: the implementation of systems is broken down into thousands of small local projects, with local NHS bodies able to adopt systems or parts of systems at times convenient to them, once the Local Service

⁹ accessible at <http://www.connectingforhealth.nhs.uk/implementation/>

¹⁰ http://www.connectingforhealth.nhs.uk/all_images_and_docs/benefits_timeline.pdf

Provider is ready to deploy. In addition, if NHS bodies' existing systems have a high degree of functionality, then provided those systems are compliant with the Spine, they need not be replaced with Programme systems until the latter achieve equivalent or better functionality.

- 2.8 The approach of delivering the Programme in five geographical clusters, reduced the size of individual contracts, thereby increasing the number of potential suppliers capable of handling the size of contracts on offer. Going forward, it also reduces the impact of any single supplier performing poorly, and offers NHS Connecting for Health the opportunity to bring in other suppliers if any one supplier fails to deliver.

NHS Connecting for Health has put in place sound project management

- 2.9 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 Programme. It has established a National Programme Office to provide central programme management services to support the planning, control and reporting of activities within the Programme.
- 2.10 As part of our examination, we commissioned Qinetiq Ltd to make an independent appraisal, against an internationally recognised systems engineering standard¹¹, of management processes in place within NHS Connecting for Health. Its observations were that project control processes were fully in place and that project planning processes were generally in place.

Work is in hand on maintaining confidentiality of patient records

- 2.11 Patients and doctors need to be assured that the confidentiality of patients' records is protected. To this end the Department has established a Care Record Development Board (CRDB), chaired by its National Director for Patients and the Public, to take the lead in considering ethical issues relating to the Programme. It has developed a Care Record Guarantee, published by Ministers in May 2005¹², setting out the principles that the Department and the NHS will apply when operating electronic patient records (Figure 6).

¹¹ 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. [will be when NAO report is published]

¹² Department of Health Press Release 2005/0185, 23 May 2005

Figure 6: The key principles of the Care Record Guarantee

- *Patients cannot opt out of having information recorded altogether* as the CRDB and the Department believe that clinicians have a professional duty to record the treatment they give to patients.
- *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. On current plans, the sealed envelope will become available from late 2007/early 2008.
- *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.
- *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.*

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

2.12 The CRDB 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, and how the planned ‘sealed envelopes’ will work in practice. And patient confidentiality remains a controversial issue among critics of the Programme, both as regards the adequacy of the planned safeguards to protect information, and whether patients should have a right to opt out of having their information recorded.

A suitable system of access control has been devised but good working practices will be essential

2.13 Electronic records present the potential for records to be accessed from anywhere on the network whilst ensuring an audit trail of who has accessed records. They also provide an opportunity for consistent standards of access control. Access will be controlled in three ways:

- (i) **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.
- (ii) **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 by local NHS bodies.
- (iii) **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.

2.14 A key issue for security will be ensuring that those working in the NHS understand and apply good security practices in their work (Figure 7).

Figure 7: Case example of potential risks to security of data

In May 2005 a number of General Practitioners at two Essex Primary Care Trusts - Castle Point and Rochford PCT and Southend PCT - were issued with smart cards 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 smart card, 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: Department of Health note to the Committee of Public Accounts

Part 3: Procuring and delivering the systems

There was vigorous competition for the contracts

- 3.1 For the eight main contracts¹³, 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 progressed. NHS Connecting for Health maintained competitive tension by negotiating contracts with at least two final bidders before selecting a winner and keeping the preferred bidder stage very short. 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, or allowances for risk or profit. NHS Connecting for Health achieved price reductions totalling £4.5 billion from the winning bidders on the eight main contracts.
- 3.2 Where the winning prime suppliers were going to use the same sub-contractors, NHS Connecting for Health used its buying power to negotiate significant price reductions from the sub-contractors. Savings from such “enterprise wide agreements” are expected to total some £140 million over the life of the Programme. NHS Connecting for Health also used its buying power to negotiate significant price reductions from other suppliers of IT to the NHS, for example, Microsoft (Figure 8).

Figure 8: 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. 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.

Source: NHS Connecting for Health, Press Release 2004/0393

NHS Connecting for Health completed the procurement of the projects swiftly

- 3.3 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 a typical procurement timetable

¹³ Choose and Book, the Spine, the New National Network (N3) and five Local Service Provider contracts.

for IT systems within the NHS of three years, and 18 months to two years for the procurement of a single major PFI project.

The contracts include strong incentives to deliver

- 3.4 **NHS Connecting for Health will not pay suppliers until services are 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. 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.
- 3.5 **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. [REDACTED]
[REDACTED]
[REDACTED] Suppliers can win these deductions back, with interest, 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 [REDACTED]
[REDACTED]
[REDACTED]
- 3.6 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.
- 3.7 **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 OGC 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 supplier) 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.

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

3.8 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 software.
- Terminated contractors have to assist in transferring the service.

The contracts include appropriate value for money mechanisms

3.9 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 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 NHS Connecting for Health can share in excess profits. All of these mechanisms are underpinned by open book accounting.



A horizontal bar chart illustrating the percentage of respondents who have heard of different topics. The y-axis lists 15 topics, and the x-axis represents the percentage from 0% to 100%. Most topics show high awareness levels, with percentages ranging from approximately 80% to 100%.

Topic	Percentage (%)
Healthcare	98
Technology	95
Finance	92
Politics	90
Entertainment	88
Science	85
Sports	82
Food & Beverage	80
Automotive	78
Real Estate	75
Automotive	72
Automotive	70
Automotive	68
Automotive	65
Automotive	62
Automotive	60

Agreement has yet to be reached on delivering a wider choice of GP systems

3.13 Until 2004, GPs provided their own IT systems. In 2004 the NHS took over this responsibility, but GPs retained the right to a choice of systems. NHS Connecting for Health expects Local Service Providers to provide GP systems in their cluster but during 2004 many GPs became concerned that Local Service Providers would be offering little or no choice of systems, and that GPs would be forced to change from their existing systems against their wishes. This was a particularly strong concern among customers of EMIS, which currently supplies 55 per cent

of GPs in England but which at the time was not among the systems on offer to GPs. The lack of choice was unpopular amongst GPs and we believe it has contributed to the Programme's difficulties in winning support among GPs.

- 3.14 In response to GPs' concerns, the Department announced in March 2005 plans in principle to allow GPs to select from any GP system supplied by any Local Service Provider¹⁴. [REDACTED]

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NHS Connecting for Health has used the levers at its disposal to improve suppliers' performance

NHS Connecting for Health action enabled targets for connections to the New National Network (N3) to be achieved

- 3.15 NHS Connecting for Health's contract with BT set demanding targets for the delivery of broadband connections and data network services which make up the New National Network (N3) (see Figure 3).

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For more information about the study, please contact Dr. Michael J. Hwang at (310) 794-3000 or via email at mhwang@ucla.edu.

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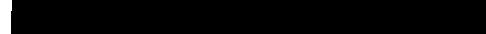
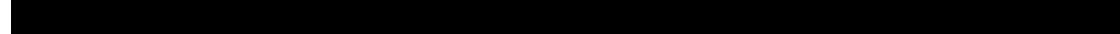
ANSWER The answer is (A) $\frac{1}{2} \pi r^2 h$.

For more information about the study, please contact Dr. Michael J. Hwang at (319) 356-4000 or via email at mhwang@uiowa.edu.

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¹⁴ Department of Health Press Release 2005/0136 23 March 2005

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



NHS Connecting for Health action led to a cheaper and better e-mail and directory service system (known as Contact)

In 2002, the NHS expected the use of e-mail to increase sharply from the then 250,000 users to 100 per cent of NHS staff by December 2003. The then implementation of e-mail was inefficient, with no national directory of staff as there were some 5,500 e-mail 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.

Term	Percentage
GMOs	~95%
Organic	~95%
Natural	~95%
Artificial	~75%
Organic	~95%
Natural	~95%
Artificial	~95%
Organic	~95%
Natural	~95%
Artificial	~95%

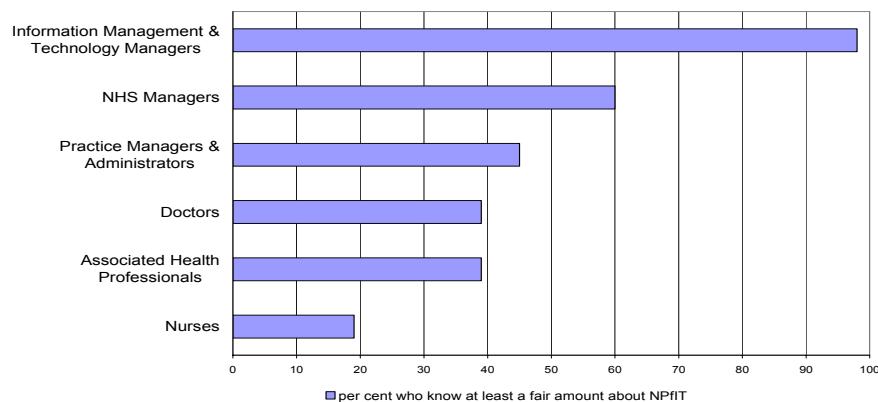
Part 4: Preparing to use the systems in the NHS

The Department has been slow in securing the engagement and commitment of the NHS to the Programme

Engaging NHS staff remains a challenge

4.1 A MORI survey of NHS staff¹⁶ in June-July 2005, commissioned by NHS Connecting for Health, found that the majority of staff were positive about what the Programme was trying to achieve in the future and considered that services provided by the Programme would help them in their daily working life to share information about patients and improve patient care. The survey also showed, however, that many had little information about the Programme. Three in ten knew nothing about the Programme and one in seven had not even heard of it whereas just under half knew at least a fair amount, including one fifth who know a great deal about it. Figure 10 shows that within the staff groups, awareness was lowest amongst doctors, nurses and allied health professionals, the most important stakeholders that the Department needs to convince of the virtues of the Programme, and highest amongst IT managers.

Figure 10: Front line staff are least familiar with the National Programme



¹⁶ The survey was the first in a series to research the impact of Programme activities on the attitudes of NHS staff and to track awareness and understanding of the Programme. Staff were asked about their familiarity with, knowledge of, and attitude to, the Programme and the systems it will deliver, their involvement in the implementation process and the provision of information. The sample covered over 1,200 NHS staff in six groups in both primary and secondary care, distributed across England. The results are representative of each staff group in the NHS.

- 4.2 Other sources suggest that NHS Connecting for Health has a lot more to do to gain the commitment of NHS staff. In its latest survey of GPs and hospital doctors conducted over mid-December 2005/January 2006, Medix¹⁷ found that support for the Programme has fallen: 26 per cent of GPs and 45 per cent of other doctors were enthusiastic about the Programme compared to 56 per cent and 75 per cent respectively two years earlier. This compares to 59 per cent of GPs and 66 per cent of other doctors who think that the Programme will improve clinical care in the long term. The survey also found that 56 per cent of doctors 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.
- 4.3 **The standing of the Programme is being harmed by uncertainty about deployment and poor communication of its benefits.** Research published in August 2005 by the London School of Hygiene and Tropical Medicine¹⁸ reported that uncertainty and poor communication were leading to a lowering of morale amongst NHS staff responsible for implementation. The research – which included interviews with a small sample of 23 clinical staff- was undertaken as part of a study looking at the processes and outcomes of implementing an electronic care record in four acute hospital Trusts. The research also found a perception that the Programme is centrally led and that local needs and considerations were not taken into account or even ignored, leading to disempowerment and a possible divide between the centre and local offices.
- 4.4 **NHS Connecting for Health has suffered from a poor image in the media.** The MORI survey found that 14 per cent of NHS staff surveyed obtained information about the Programme from specialist publications and 5 per cent from national and local media. Negative reporting about the Programme and its progress will tend to increase the level of NHS staff cynicism about the Programme. The poor record of the NHS in implementing IT systems has not helped NHS Connecting for Health in countering the image of the Programme in the media.

¹⁷ Medix is a research organisation which conducts surveys of medical practitioners on behalf of organisations wishing to find out the views of medical practitioners. 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, representing 1.5 per cent of practicing doctors in England across a balance of specialties.

¹⁸ *Challenges to Implementing the National Programme for Information Technology:A Qualitative Study*. J Hendry, BC Reeves, N Fulop, A Hutchins, C Masseria. Department of Public Health and Policy, London School of Tropical Medicine, British Medical Journal 6 August 2005.

The Department was slow to demonstrate clear and effective leadership to engage NHS organisations and staff

- 4.5 To gain the support of those who are going to use the Programme's systems, the Department and NHS Connecting for Health needed to communicate widely from the outset why the Programme had been designed in the way it was, why it was being procured centrally, the benefits it was expected to generate for patients and the users, and how confidentiality and security were to be protected. Communication and engagement, however, was initially given inadequate priority with the Department and NHS Connecting for Health taking the deliberate decision to give the procurement and the letting of contracts priority.
- 4.6 The Department's ability to communicate was hampered by a lack of continuity in the appointment of a Senior Responsible owner responsible for communicating with NHS organisations and staff. At the inception of the Programme, the Department's Director of Research, Analysis and Information was the Senior Responsible Owner for the Programme as a whole. He retired in March 2004, and the Director General for IT took over as Senior Responsible Owner, with further Senior Responsible Owners responsible for individual components of the Programme. However, the Director General for IT had no management responsibility for NHS bodies, and was never responsible for ensuring that the NHS' input to implementation and realising business benefits was delivered. Between April 2004 and May 2005, the Department appointed three different people to fulfil the role of engaging with the NHS. 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.

Clinicians have been involved in the design of the systems

Procurement and development of the Programme has centred on an “Output Based Specification” (OBS)

- 4.7 NHS Connecting for Health initiated development of the OBS, a statement of the functions that the planned IT system is intended to perform, in February 2002 and issued it to suppliers in May 2003. We encountered a widespread view that there had been a lack of consultation about the development of the OBS. Whilst we found that NHS Connecting for Health developed the OBS after engagement with a broad spectrum of NHS stakeholders, we also found that it could not demonstrate that the process it had adopted for the design of the Programme architecture had been defined or documented¹⁹. The process to develop the OBS was therefore likely to

¹⁹ Process Capability Review conducted by Qinetiq Ltd on behalf of the NAO

lead to a workable system, even if it was not wholly successful in building a broad level of support for the Programme among NHS staff.

Clusters are using clinical input to influence the design of Local Service Providers' systems

- 4.8 Clusters have set up Clinical Advisory Groups to obtain clinical input on specific systems as they are being developed and include 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.

Local Service Providers have clinical teams assisting in the development of their systems

- 4.9 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 and allied health professional staff, emphasising the involvement of non-medical staff in their clinical teams. They have also drawn upon clinical expertise from elsewhere in their organisations and from an international perspective.

NHS Connecting for Health is taking steps to inform future users and win their support

NHS Connecting for Health has its own website

- 4.10 In 2004, NHS Connecting for Health set up its own website²⁰ with 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.

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

- 4.11 In November 2004, the then Senior Responsible Owner for Service Implementation appointed seven National Clinical Leads to champion four occupational groups in the NHS: GPs, hospital doctors, nurses, and allied health professionals. The increased levels of dialogue fostered by the introduction of Clinical Leads were highlighted by the professional bodies we consulted as

²⁰ <http://www.connectingforhealth.nhs.uk>

a positive development. For example, The National Clinical Leads demonstrated they can have an influential role by highlighting the demand from GPs for a wider choice of GP system.

Figure 11: National Clinical Leads

- | |
|--|
| <ul style="list-style-type: none">• 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;• 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. |
|--|

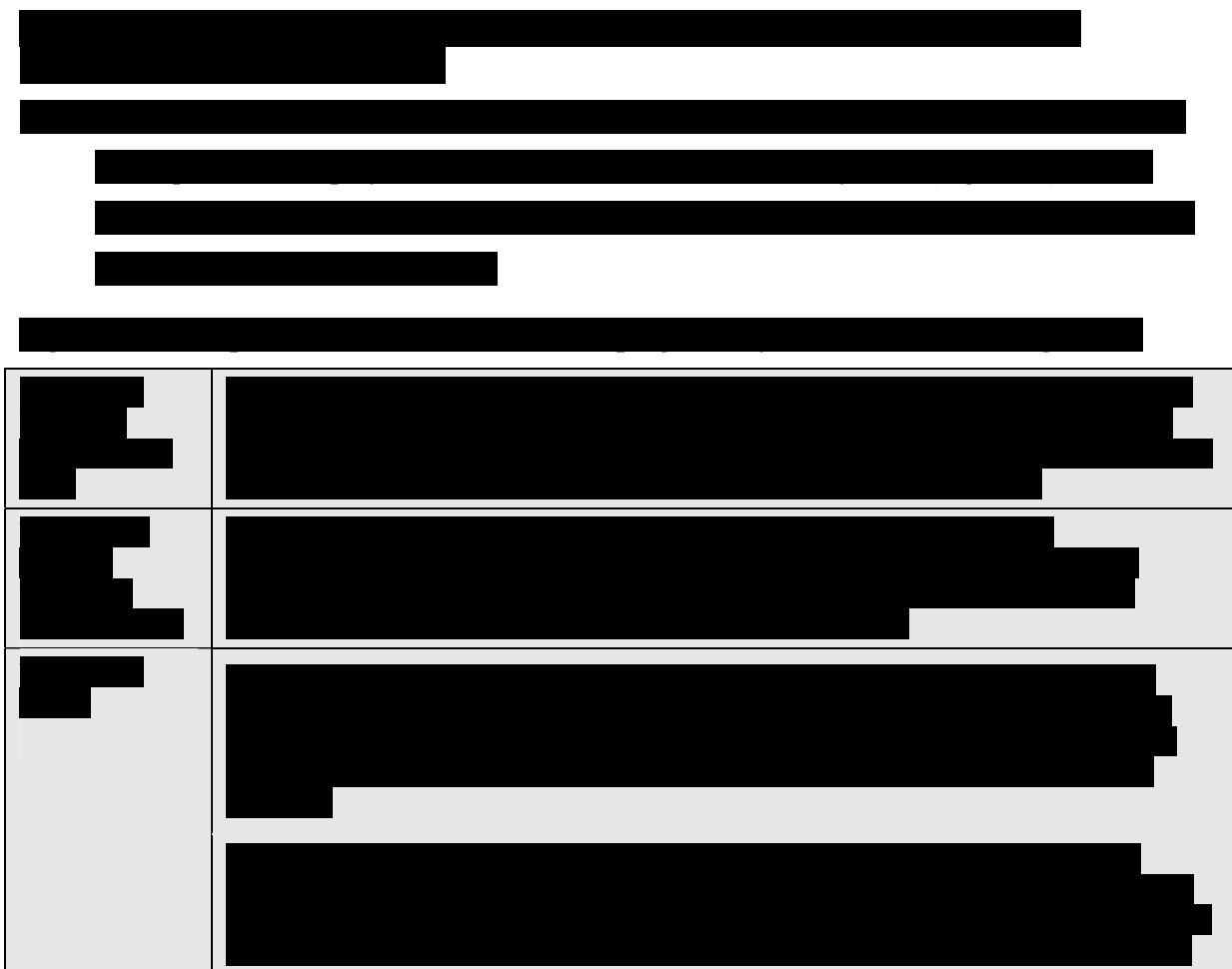
Source: National Audit Office examination

NHS Connecting for Health launched a campaign in September 2005 to increase awareness of the National Care Record Service

- 4.12 The results of the MORI survey of NHS staff and the Medix survey of doctors suggest that the Department and NHS Connecting for Health have a long way to go to secure the commitment and enthusiasm of NHS staff and overcome a considerable rump of distrust and cynicism about the Programme. 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.
- 4.13 In January 2005, NHS Connecting for Health appointed Porter Novelli, a public relations company, to carry out a public and patient information campaign informing NHS staff and the public about the new ways of accessing patient information on the Care Records Service. The campaign has three stages:
- (i) 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.
 - (ii) The second stage, in early 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.
 - (iii) The third stage, later in 2006, is designed to reach every member of the public in England, including a summary leaflet to be sent to 21 million households. The campaign will explain to patients the choices available on sharing or withholding medical information and promote awareness of the potential benefits and risks from the introduction of the Services.

Those working in the NHS are disappointed by the slow development and deployment of the Programme

4.14 The MORI survey found that a minority of NHS staff questioned (ranging from 13 per cent of nurses to 32 per cent of doctors) are currently unfavourable towards the Programme because they feel it is moving slower than they expected and because implementation dates are not being met. The 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 has dented enthusiasm for the Programme amongst these groups. Changing deployment timetables have also hampered Trusts' ability to plan the resources for hardware and training needed to help ensure smooth transition and acceptance of the new systems. One of the key challenges NHS Connecting for Health and the Department face, 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.



The Department plans to use its systems for monitoring and managing performance to help deliver the Programme

- 4.16 There have been problems in getting GPs to register to use Choose and Book and to get NHS organisations to develop business cases for PACs. The latter led Local Service Providers to seek compensation from NHS Connecting for Health for being prevented from achieving their contractual delivery dates, and hence getting paid for delivery. The Department decided to use its performance management regime, which has a record of success in securing local achievement of key national NHS targets, such as on waiting times, 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. The Department is also emphasising to Strategic Health Authorities and all Primary and NHS Trusts that it considers implementation and use of Programme outputs to be one of their key priorities.
- 4.17 In June 2005, the Department and NHS Connecting for Health issued a joint letter to all SHA Chief Executives instructing them to develop a draft Integrated Service Improvement Plan. These plans will include joint objectives for the next three years, the workforce involved, modernisation, finance and IT solutions and impact on performance. They will also bring together benefits and improvements resulting from all the different initiatives and programmes including the Programme. Local Health Communities are required to develop a final integrated service improvement plan by March 2006, in preparation for the measurement and delivery of benefits in 2006-07.

There may be insufficient trainers to train NHS staff

- 4.18 The majority of the NHS' 1.3 million staff will need training to use the Programme's systems as lack of staff knowledge and training is seen as the biggest barrier to implementing the Programme,²¹ and IT professionals will be needed to implement the systems locally in conjunction with the Local Service Providers. 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.

²¹ MORI survey of NHS staff on behalf of NHS Connecting for Health, June-July 2005

4.19 NHS Connecting for Health's strategy requires there to be sufficient staff to become trainers.

Within the NHS existing trainers in Trusts are already working to capacity and more trainers are required to deliver the volume of training needed for Programme systems. Strategic Health Authorities and Trusts are actively recruiting more trainers, but are having problems in recruiting those with the skills needed and as Local Service Providers are also recruiting from the same pool; the scarcity of suitably qualified candidates is driving salaries up.

The NHS currently lacks sufficient skills to support the delivery of the Programme

- 4.20 The quality and quantity of IT staff, those with technical IT expertise and those with good knowledge and experience of delivering and managing projects, within the NHS is a risk to the successful development and deployment of the Programme. Of the 28 Strategic Health Authority Chief Information Officers, all of whom have special responsibility as a source of expertise and knowledge on the Programme, just six are board level appointments. This, or the absence of other sufficient championing of the Programme at Board level in Trusts, may reduce the capacity of NHS boards to drive forward the Programme by supporting the deployment and implementation of Programme systems.
- 4.21 In April 2005, in recognition of difficulties in the recruitment, training and development of IT staff, and the development of IT skills more generally amongst NHS staff, the NHS Faculty of Health Informatics was placed within the Service Implementation Team of NHS Connecting for Health. It took this step to focus efforts to develop health informatics professionalism and qualifications as an integrated part of the Programme.
- 4.22 Trusts often use staff taken from clinical duties to carry out project management functions, regardless of any project management knowledge or expertise. 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 1: Methodology

Aspect	Methodology - how we examined
1) Developing a concept for what the systems should do <i>Whether the Programme's vision is soundly based</i>	(i) Review of the business case and prospectus of the architecture of the Programme and how the expected benefits will be delivered. (ii) Identified lessons learned from current NHS systems and how the Programme has incorporated lessons from these. (iii) Commissioned a paper from Professor Ross Anderson of Cambridge University reviewing developments in health informatics in other countries (This report is [will be] published on the NAO website at www.nao.org.uk). (iv) Reviewed evidence of changes to scope from contracts awarded.
2) Whether the National Programme is on course to deliver the systems <i>Whether</i> a) <i>The procurement contracts are likely to deliver value for money</i> b) <i>The systems are being delivered</i>	(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) Examined 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) Examined 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 <i>The extent to which</i> a) <i>Action is being taken to realise benefits enabled by the systems</i> b) <i>NHS managers and staff are likely to take advantage of the Programme</i>	(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. (b) RIDs' role in gaining the engagement, commitment and support of senior NHS officials in the Programme. (ii) Identifying case 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. (iv) Review of the results of a survey of NHS staff undertaken by MORI in June-July 2005, commissioned by NHS Connecting for Health, to track understanding and awareness of services delivered by the Programme across the NHS. (v) Interviews with key representative bodies – Academy of Medical Royal Colleges, Royal College of General Practitioners, Nursing and Midwifery Council, Allied Health Professionals, British Medical Association, Royal College of Nurses, NHS confederation, NHS Alliance, British Computer Society, the Worshipful Company of Information Technologists, Intellect, 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

	<p>in place to generate engagement (b) how the Programme is being communicated.</p> <p>(vii) Interviews with National Clinical Leads about their role and the action they are taking to promote the Programme.</p> <p>(viii) Review of survey results from Medix and the RCN to assess the awareness of and extent of communication about the Programme</p> <p>(ix) 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).</p> <p>(x) Visited two early roll out sites to identify examples of what the Programme is delivering in practice.</p>
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4) Development of appropriate structures and infrastructure

<p><i>Whether</i></p> <p>a) Project management is fit for purpose</p> <p>b) Governance arrangements are adequate</p> <p>c) Relationships between the Programme, the NHS and contractors are working</p> <p>d) Budgets are available, controlled and monitored</p>	<p>(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 and the actions NHS Connecting for Health has taken in response is [will be] published on the NAO website at www.nao.org.uk).</p> <p>(ii) Interviews with NHS Connecting for Health officials in key positions.</p> <p>(iii) Examination of (a) Programme and (b) NHS arrangements for determining, monitoring and control of overall costs.</p>
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5) Delivery of required training

<p><i>The extent to which</i></p> <p>a) Training requirements have been assessed</p> <p>b) Resources are available</p> <p>c) Progress is being made</p>	<p>(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.</p> <p>(ii) Interviews with RIDs to identify training plans in place at regional level.</p> <p>(iii) Assessment of 14 Project Initiation Documents prepared across all five clusters to identify training plans in place at local/trust level.</p> <p>(iv) Consulted Workforce Confederation (commissioners of NHS Training) to determine scale of training required, resources needed, and plans in place to deliver.</p> <p>(v) Review of training being delivered in Clusters to identify examples.</p>
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6) Recruitment and retention of manpower

<p><i>Whether staff numbers and skills are sufficient to deliver the Programme in</i></p> <ul style="list-style-type: none"> - the Programme itself - the NHS - contractors and suppliers 	<p>(i) Consultation of the Programme/RIDs/contractors about capability of (a) Local Service Provider staff and (b) NHS IT staff to deliver the Programme.</p> <p>(ii) Review of documentation of Workforce Confederation to assess skill levels needed to deliver training.</p> <p>(iii) Consultation of Workforce Confederation to identify whether sufficient trainers are being recruited and the qualifications they require.</p>
<p><i>Whether</i></p> <p>a) There is an appropriate performance and deduction regime for contractors</p> <p>b) There is provision for changes in requirements</p> <p>c) The systems are secure and resilient</p>	<p>(iv) 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.</p> <p>(v) Consulting NAO IT experts about the robustness and security of the systems being developed.</p>

Appendix 2: 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 procurement.
- **Maintaining competition.** Negotiating contracts with more than one final bidder maintains a competitive tension between bidders and may offer further reductions in price.
- **Very short preferred bidder stage** helps to avoid 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’** 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.
- **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 3: Developments in International Health IT

1. The National Programme is the largest civil IT project in the world. It also represents the largest spend on health service IT within Europe. A research paper commissioned by the National Audit Office by Cambridge University's Foundation for Information Policy Research found that, as a result of the National Programme, England spends some 30 per cent of the European total spend on healthcare IT of around £5 billion.²²
2. The scope and vision of the National Programme is wider and more extensive than any ongoing or planned healthcare IT development programme in the world. The Department of Health has the opportunity to realise its vision because (i) England has a relatively centralised NHS compared to other countries and (ii) it has the funding commitment to do so. European Union countries that are planning or developing healthcare IT programmes are seeking to adopt elements of the services planned for the National Programme, such as electronic patient records and broadband connections, but none are adopting all (Figure 13).
3. Countries introducing an electronic patient record face the same interoperability problems presented by a diversity of systems as in England. However, with less centralised systems than the NHS and without a similar injection of funding to the National Programme for IT, they are more often moving towards interoperability between locally maintained systems through standards and messaging facilities (as, for example, in Germany, Sweden, and The Netherlands) rather than adopting a centralised patient record.

Figure 13: The Introduction of IT in healthcare internationally

France	Electronic patient record to link hospital record planned for 2007.
Germany	A strategy for health launched in 2003 with a view to introducing smartcards and electronic prescribing by 2006. Maintenance of electronic patient records is a local responsibility and not seen as a priority.
Italy	Government working towards a national IT strategy, but not yet available. Broadband developed on a local level.
Spain	No central IT strategy, with expenditure driven by individual hospitals.
Sweden	IT development started in 2000, focussing on standards and messaging. A leader in electronic prescribing with 20 per cent of prescriptions filed electronically.
The Netherlands	Healthcare highly centralised as in England. Electronic patient records based upon messaging and standards being promoted, with decentralised implementation.
Poland	No current national programmes in place. Main focus is to establish Local Area networks and patient administration systems in hospitals.
United States of America	Recently appointed a national IT Czar with a view to enhancing interoperability rather than a central repository of data.

Source: Cambridge University, Foundation for Information Policy Research. Paper commissioned by the NAO

²² "Healthcare IT in Europe and North America" paper by Foundation for Information Policy Research, May 2005. This paper is published [*will be on publication of this report*] in full on the National Audit Office website at <http://www.nao.org.uk>

Appendix 4: Concerns 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 concerns which are set out in this Appendix.

(Note: Some correspondents raised a number of issues)

Theme	Concern 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 and 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 solid 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 General Practitioners' (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.

7 Use of PACS Systems	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 the Patient Archiving and Communication Systems (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 Practice Contract.
9 The contracting process	The monitoring and control over the contacting 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.
<i>Source: Correspondence with the National Audit Office</i>	