Department of Health

The power of information:

Putting all of us in control of the health and care information we need – *Impact Assessment*

Title:
The Power of Information: Putting all of us in control of the health and care information we need

IA No: N/A

Lead department or agency:
Department of Health

Other departments or agencies:
Other Government Departments: Department for Communities and Local Government. Agencies: NHS Information Centre for Health and Social Care, Care Quality Commission, Monitor, Public Health England, NHS Commissioning Board

Impact Assessment (IA)

Date: 16/05/2010

Stage: Final

Source of intervention: Domestic

Type of measure: Other

Contact for enquiries:
informationandtransparency@dh.gsi.gov.uk

Lawrie Morgan

Summary: Intervention and Options

Cost of Preferred (or more likely) Option

Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, One-Out?	Measure qualifies as
£5,059m	N/A	N/A	No	N/A

What is the problem under consideration? Why is Government intervention necessary?

Governments have intervened in the NHS information market to address the problems that elements of it are a natural monopoly and that investment generates positive externalities. However, past interventions in this market have not fully resolved these problems, and there are still several shortfalls relating to: information asymmetries, positive externalities leading to sub-optimal investment in information, service user information becoming increasingly fragmented, insufficient information to support service user/commissioner choice, and there is a disconnect between health and social care information infrastructures.

What are the policy objectives and the intended effects?

To reduce, as far as possible, the information asymmetries which exist in health and social care. To result in service user-level electronic data which can easily be accessed by service professionals. To stimulate the market for health and care information, such that the optimal quantity and quality of information is provided, to both service users and service professionals, by whichever sector can most effectively provide this, including to support service user/commissioner choice. To provide a single portal for web-based service user information. To remove the disconnect between health and social care information infrastructures.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Option 1: Do nothing

Option 2: (i) Provide service users easier access to information, including a single on-line portal and on-line access to their health and social care records which they can share with others; (ii) Set standards which remove inappropriate barriers to sharing information within and across organisational boundaries; (iii) Over time, adopt standards which ensure that, where appropriate, patient information is recorded once digitally in a form which encourages multiple secondary uses. This is the preferred option.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** To be decided

Does implementation go beyond minimum EU requirements?					
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro** No	**< 20** No	**Small** No	**Medium** No	**Large** No
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** N/A	**Non-traded:** N/A	

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible SELECT SIGNATORY: .... Date: 17th May

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2012	**PV Base Year** 2012	**Time Period Years 10**	**Net Benefit (Present Value (PV)) (£m)**		
			Low: N/A	**High:** N/A	**Best Estimate:** 0

COSTS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	N/A	N/A	N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	0		0	**0**

Description and scale of key monetised costs by 'main affected groups'

As this is the 'do nothing' option, there are no key monetised costs.

Other key non-monetised costs by 'main affected groups'

As this is the 'do nothing' option, there are no key monetised costs.

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	N/A	N/A	N/A	**N/A**
High	N/A		N/A	**N/A**
Best Estimate	0		0	**0**

Description and scale of key monetised benefits by 'main affected groups'

As this is the 'do nothing' option, there are no key monetised benefits.

Other key non-monetised benefits by 'main affected groups'

As this is the 'do nothing' option, there are no key monetised benefits.

Key assumptions/sensitivities/risks **Discount rate (%)** N/A

As this is the 'do nothing' option, there are no key monetised benefits.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			**In scope of OIOO?**	**Measure qualifies as**
Costs: 0	**Benefits:** 0	**Net:** 0	No	OUT

Summary: Analysis & Evidence

Policy Option 2

Description: Provide a national framework for information flows and standards on health and social care providers.

FULL ECONOMIC ASSESSMENT

Price Base	PV Base	Time Period	Net Benefit (Present Value (PV)) (£m)		
Year 2012	**Year** 2012	**Years** 10	**Low:** Optional	**High:** Optional	**Best Estimate: £5,059m**

COSTS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	Optional	N/A	Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	N/A		£154m	**£1,275m**

Description and scale of key monetised costs by 'main affected groups'

Almost half of the costs fall on local NHS organisations in providing the infrastructure for transfers of information and annual staff costs to support the actions in option 2. The majority of the remaining costs accrue centrally to facilitate the strategy, particularly running the online portal. Local authorities, as providers of adult social care, incur £300m (2011/12 prices) of costs associated with the secure transfer of information.

Other key non-monetised costs by 'main affected groups'

None identified.

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Optional	N/A	Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	N/A		£786m	**£6,334m**

Description and scale of key monetised benefits by 'main affected groups'

GP Practices gain efficiency benefits from contacts per patient. Patients gain time savings from reduced GP contacts and QALY gains from benefits such as earlier diagnosis and reduced medical errors. Health and social care providers will realise cost savings from reductions in the paper transfer of information. The centre will benefit from the reduction in the duplication of online information and website provision.

Other key non-monetised benefits by 'main affected groups'

None identified.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

Delivery of many elements of option 2 is delegated to bodies which are not yet fully operational. This dependency on delegated central powers is a significant risk. Significant benefits accrue from patients accessing their records online, low uptake of this offer will reduce the magnitude of benefits. Local NHS organisations may fail to prioritise system changes for benefits and efficiencies to be realised. Delays in implementation may increase costs or reduce the scale of benefits realised.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: 0	**Benefits:** 0	**Net:** 0	No	OUT

Evidence Base (for summary sheets)

A: The problem under consideration/summary of analytical narrative

Characteristics of the underlying problem (its symptoms and diagnosis)

Economic context/history to the problem under consideration

Information is an essential component of the NHS and social care infrastructure; it is part of the NHS's and social care sector's structure to help decision makers add value to health and care services and for services users to engage in their health and care.

The optimal information infrastructure in healthcare markets like the NHS and social care require significant up-front fixed costs. Therefore, some elements of information here can be considered a natural monopoly i.e. it is more efficient for there to be a single information system than several competing information systems for some elements of information. Therefore, Government provision and/or regulation is required. However, the NHS Health and adult Social care service is not set up as a single purchaser and provider of health and care services, and individual agents within health and social care are unable to afford and/or coordinate the production of such an information infrastructure.

Agents within the health and social care sectors are only incentivised to invest in information infrastructures to the benefit of their individual efficiency. They are not incentivised to invest in information infrastructures which benefit the health and social care service efficiency as a whole, over and above the efficiency of individual agents. In other words, there are positive externalities from investment in information infrastructures, including to the wider economy and society. These externalities mean that, left to their own devices, individual agents within health and social care will sub-optimally invest in information structures. This includes the possibility that information investment is at the optimal level, but is not invested in a way which yields maximum benefit.

There are two key examples of how this externality manifests itself on the front line:

i. the way information about service users is recorded: Professionals often record information in a way that makes sense to them alone, rather than other professionals or service users (as they have little incentive to do otherwise). This results in potentially valuable information being difficult or time consuming to share and adversely affects the efficiency (in both the cost and quality dimensions) of the system as a whole: for example, by adversely impacting continuity of care. Annex A discusses the practical manifestations of this externality in more detail as well as discussing the technical issues involved; and

ii. duplication of professionals' time processing information: by its devolved nature, the health and social care sectors have developed parallel processes and/or systems which meet their local requirements on a range of management issues. However, the positive externality from information sharing not only results in some types of information not being generated/shared, but also results in duplication of professionals' time across providers in processing the information that is shared.

Therefore, there is rationale for Government intervention in the NHS and social care information market. As a result, the Government has previously intervened in this market e.g. by providing and regulating the information market for, amongst other things, activity (HES) and unit costs (Reference Costs).

The problem under consideration now

Previous Government interventions in the health and social care information market have not fully resolved the problems outlined above. The remaining information shortfalls being addressed in *The power of information* can be classified in the following breakdown:

1. **Positive externalities:** Previous Government interventions in the NHS information market have failed to fully address the problem of individual agents within the market only investing in information structures which benefit their own efficiency. Resolving this problem would increase the efficiency of the NHS and adult social care service, both in the cost and quality dimensions.
2. **Information asymmetry:** Several information asymmetries still exist in the NHS. For example, between service users and GPs (resulting in allocative inefficiency in the healthcare services provided to service users), between commissioners and providers (resulting in a principal-agent problem leading to sub-optimal quality of care provided), and between clinicians, including across providers (resulting in sub-optimal quality care being provided to service users).
3. **Insufficient information available to service users and healthcare professionals on medium to long-term patient outcomes:** This is likely to lead to allocative inefficiencies in the healthcare services provided to service users and/or sub-optimal quality of care provided to service users by health and care professionals.
4. **Information provision is fragmented:** There is a wealth of information available to service users via the internet. However, this information has developed in a fragmented way; e.g. because entry barriers to providing information online are low, resulting in duplication and an absence of quality assurance.
5. **Insufficient information to support choice:** Service user and commissioner choice is a key lever in the operation of health and social care. However, information to support choice has not developed sufficiently in line with choice policy

e.g. service users have choice of consultant-led-team, but there is currently limited information available to support this choice.

6. **Disconnect between the NHS and social care information infrastructures:** There is considerable connectivity between the services provided by the NHS and social care. However, their respective information infrastructures do not mirror this service connectivity, resulting in inefficiencies in service delivery e.g. important information can be lost in the transfer of service users from NHS to social care settings, sometimes leading to sub-optimal (potentially unsafe) care provided, with potentially significant knock-on financial implications.

The context and analytical narrative

Context

The electronic capture, storage and transfer of information is widely recognised as an effective approach to provide different stakeholders with timely access to health and care information. Subsequent use of this information can improve patient care in multiple ways. For example, the opportunity for safety to be compromised is reduced by a fuller set of patient records, and more efficient use of clinical time provides opportunities for improved access to services. Adoption of electronic record keeping across different sectors of the health and care service has been mixed, primarily driven by the needs of the clinician or care provider at the point of contact with the patient.

The current information infrastructure is a legacy of various organisational investment programmes and reflects the different cultures, working practices and technical strategies across local government, NHS regional and local care communities, community, charitable and private sector organisations.

The Wanless report 2002 cited evidence for cost savings and improvements in quality and safety resulting from investment in ICT. Under the most optimistic scenario, the report suggested that ICT spend should more than double from £1.1bn in 2002 to £2.7bn by 2007/08, subject to consideration of several factors, including:

i. the Government and the health and care service must ensure that they have clear and well developed views about the benefits which they want to achieve and how they will be delivered, with service users at the core of the system. The implications for staff training will also need to be considered; and

ii. to avoid duplication of effort and resources and to ensure that the benefits of ICT integration across health and adult social care services are achieved, the Review recommends the stringent standards should be set from the centre to ensure that systems across the UK are fully compatible with each other.

Primary care has made the most progress in the use of information and communications technologies (ICT) for patient contacts: there is almost universal electronic recording of transactions and clinical records, and the widespread use of coding systems (eg READ and SNOMED) enables information from records to be readily extracted and summarised. Secondary care is still heavily reliant on clinical coders to populate standard activity records from paper records, used to derive cost and payment information. Social care organisations also often use paper based systems for recording information about service users.

We estimate that NHS expenditure on Information Technology and Management (IM&T) in health is currently around £2bn per year allocated locally and an additional £1bn spent nationally (see Annex B). The growth to this level of spending over recent years has achieved the anticipated funding anticipated in the Wanless Review for the fully engaged scenario. This spend has given us an impressive range of locally driven solutions to clinical recording plus a high quality national view of activity and performance.

The ambition for fully integrated electronic and shared care records in a secure environment across health and care services is not new. It was at the core of the vision set out in 2002 in 'Delivering 21st Century IT', which in the form of the National Programme for IT (NPfIT) sought to implement and which has been achieved in part.[1] In particular in establishing an underpinning nation-wide, secure digital infrastructure through networks and applications linking primary and secondary care providers for messaging including correspondence and images, and booking of outpatient appointments.

However, NPfIT has not delivered the core component of that vision: a universal structured person based electronic care record, within the time and cost planned. Key reasons highlighted by an arm's length evaluation programme and external monitoring bodies including the National Audit Office and The Public Accounts Committee Reports include:

i. the requirement for fundamental design of new software to a highly tailored NHS specification. This was uneconomical for suppliers to dedicate resources to for a single market, resulting in two of the major suppliers awarded contracts withdrawing;

ii. the complexity of the contract framework covering a 10-year period proved unable to respond flexibly or quickly enough to wider changes in the NHS including:
   - Challenges for governance to reflect shifting responsibility and accountability;
   - Difficulties in aligning different organisational priorities and locally incurred costs or dis-benefits for system wide benefit;

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[1] The Impact of eHealth on the Quality and Safety of Healthcare, Final report for the NHS Connecting for Health Evaluation Programme (NHS CFHEP 001), January 2011.

   - Inability to match more innovative functionality already enjoyed by some leading organisations.

iii. deployment approaches failed to address the scale of local change required to implement systems, and to articulate and monitor local benefits effectively e.g. plans focused on delivery statistics rather than meaningful utilisation once systems were deployed. Business and clinical benefits enabled by the new technologies were not communicated well or understood and locally owned sufficiently in many cases. Implementation plans were also undermined by the continued delays in system-delivery and the increasing autonomy of local organisations, at odds with national programmes outside their direct control; and

iv. the centrally managed and owned approach has meant a relative concentration of informatics expertise, capacity and capability at the centre and a parallel loss of these skills in local organisations, with reduced understanding and leadership of the information agenda as a key business enabler.

The principal related Government policies

The principal related Government policies to the Information Strategy are as follows:

i. 'Equity and excellence: Liberating the NHS' – White Paper;[2]

ii. 'Health and Social Care Act 2012';[3]

iii. 'The plan for growth';[4]

iv. Cabinet Office 'Transparency – overview'[5] – forthcoming Open Data White Paper;

v. future forum report;[6]

vi. Information Revolution Consultation;[7]

vii. Public Health White Paper;[8]

viii. forthcoming Social Care White Paper; and

ix. EU Digital Agenda for Europe 2010-20.[9]

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[2] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_117353

[3] http://www.dh.gov.uk/en/Publicationsandstatistics/Legislation/Actsandbills/HealthandSocialCareBill2011/index.htm

[4] http://cdn.hm-treasury.gov.uk/2011budget_growth.pdf

[5] http://www.cabinetoffice.gov.uk/content/transparency-overview

[6] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127443

[7] http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_120080

[8] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_121941

[9] http://ec.europa.eu/information_society/digital-agenda/documents/digital-agenda-communication-en.pdf

The analytical narrative

Any new central intervention in the information market needs to learn from previous issues whilst building on the more successful elements of previous interventions. The key principles should be:

i. the current infrastructure providing a sound basis for future development using emergent open and flexible technologies, better able to align with diverse providers and more locally led objectives. A new standards approach should include continued central management and delivery of secure networks to enable a jointly coordinated and phased transition;

ii. national applications still being deployed while they continue to provide cost effective solutions from national and local perspectives. Migration plans to next generation systems continue to be developed, these include: Picture Archiving and Communication Systems (PACS), Choose and Book and GP to GP;

iii. a framework of standards should be developed and agreed in partnership with all stakeholders, ensuring ownership and compliance by autonomous organisations and a responsive supplier market. For example, a small number of key direction setting interventions including financial incentives, coordinated procurement (GPSoC) and requirement to implement only systems that are compliant with nationally agreed standards of interoperability has seen suppliers respond innovatively and with agility to enable the full adoption of electronic record systems in primary care; and

iv. future business cases should prioritise strategic alignment of system-wide interventions with policy priorities, regulations and performance monitoring. This will underpin a robust and coordinated approach to support development of investment at national, community and single organisation levels.

By adhering to these principles, any new central intervention in the information market for health and social care should be able to deliver a more effective information infrastructure without increasing current levels of spend, both nationally and locally, on IM&T in health and social care in total. However, It should be noted that this Impact Assessment examines the impact of *The power of information* in isolation from this wider context.

B: Policy objectives and intended effects

There are two high level objectives: the first is to remove all geographic or administrative boundaries of patient care and to be able to present the entirety of a care pathway as a single virtual electronic record; the second is to eliminate all data duplicate collection processes where the purpose is to deliver financial/efficiency/planning information. In future, these management requirements are to be supported by direct analysis of clinical and care records. The hypothesis is that current resources deployed on collection for solely management information must be re-allocated to provide comprehensive person-based care records from which information is derived for all other purposes and used as widely as possible.

The specific objectives are outlined below:

To secure service user level electronic data, easily accessed by all parts of health and social care i.e. internalise the positive externality. The effects here will be to:

i. increase the quality of health and care services provided to service users e.g. by ensuring up-to-date information is available to support *no decision about me without me* for both healthcare professionals and service users;

ii. increase the efficiency of health and care providers e.g. reducing duplication of work where service users present at more than one provider; and

iii. contribute to removing the disconnect between the health and social care information systems.

To reduce the information asymmetries, which exist in the health and adult social care. The effects here will be to:

i. increase the allocative efficiency of health and care services provided to service users by decreasing the information asymmetries between service users and service professionals; and

ii. increase the quality of care provided to service users by reducing the information asymmetries between commissioners and providers and between professionals (including across providers).

To stimulate the market for information to both service users and health and care professionals, by whichever sector can most efficiently provide this, including to support patient/commissioner choice. The effects here will be to:

i. increase the allocative efficiency of health and care services provided to service users by increasing the quality of information available to service users and/or commissioners; and

ii. increase the quality of healthcare provided to service users by increasing the quality of information available to health and care professionals.

To reduce the fragmentation of information currently existing in the NHS and adult social care information market. Reducing fragmentation will increase the effectiveness of using information (e.g. through ease of use), increase the number of users of information, decrease the duplication of information provision and ensure that information is appropriately quality assured. The effects of reducing fragmentation will be to contribute to all of the above by making the information market more effective, especially in improving the use of information by disadvantaged groups, thereby contributing to narrowing health inequalities.

To ensure that an effective support function for information access exists to enable service users to fully access/utilise the new information infrastructure. The effects of a successful information access and support function will be to increase the number of service users accessing information, and the effectiveness with which they use that information i.e. contributing to all of the above by making the information market more effective, especially in improving the use of information by disadvantaged groups, thereby reducing health inequalities.

To remove the information disconnect between the health and adult social care providers to improve the efficiency and quality of services provided to those who transfer between health and social care settings.

C: The underlying causes of the problem (its aetiology)

Note: when considering the problem's aetiology, the NHS information infrastructure is used as an example. However, the same principles can be extended to social care information.

Reviews of the suitability of the NHS information architecture and guidance on its development have been regular pieces of work in the Department of Health since the early 1970s. For example, the 1974 review sought to 'reconsider and if necessary to revise NHS computing policy and programme in the light of the progress of applications'.[10]

Since 1990 there have been five reviews/guidance of the NHS information architecture.[11] Such information strategies usually follow significant NHS organizational change as the desired information architecture changes depending on the form of the NHS architecture it serves. Figure C.1 (overleaf) shows an analysis of which information shortfalls, as currently identified, were examined in the information reviews since 1990.

Figure C.1 shows that several of the currently identified information shortfalls have been identified and attempts made to rectify these in several previous information strategies. However, there are also currently identified information shortfalls which were not addressed in these previous reviews.

The fact that there are information shortfalls being identified across several information strategies suggests that these strategies are failing to fully solve these shortfalls. Therefore, it is important to recognise why these shortfalls have not been completely remedied by previous strategies. There are two explanations for this, which are not mutually exclusive:

i. previous strategies have failed to address the information shortfalls outlined in Section A relating to the NHS not being incentivised to invest in optimal

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[10] *'Annual Review of National Health Service Computing 1974'.*

[11] *'Working for Patients: Framework for Information Systems* (1990); *'Getting Better with Information: An IM&T Strategy for the NHS in England'* (1992); *'Information for Health'* (1998); *'Building the Information Core – Implementing the NHS Plan'* (2001); *'Delivering 21st Century IT Support for the NHS – National Strategic Programme'* (2002).

information structures. Current financial governance requires individual organisations to seek maximum financial return on their own investment, even though marginal additional cost might deliver greater benefit in another organisation and give better economic value for money for the health and case service as a whole. It is in such cases where national programmes have been used as a vehicle to overcome this externality. For example the national network (N3) or the Secondary Uses Service. Ownership of investment and choice of technology is being returned to local level but some national standards and services will always be needed; and

ii. there are 'cultural' barriers to the investment in optimal information structures. For example, new information systems often take over ten years to fully realise their benefits, local NHS planning horizons are much shorter, often resulting in funds that were hypothecated for information structures being diverted locally to address more immediate targets. Similarly, embedded changes in how information is used within clinical practice in primary, secondary and adult social care takes considerable effort by the managers of those organisations and the various professional bodies in training, continuing professional development and governance systems. Therefore it is vital that an information strategy addresses these cultural, as well as incentive related information shortfalls, barriers to optimal information investment. This is also an issue identified in the NHS Future Forum report.[12]

In light of previous strategies, it is important to recognise that the nature of the information architecture required by the NHS is likely to change in the future to reflect rising public expectations on quality, and developing efficiencies that can be achieved through the better use of information. This links to point ii above: if an information strategy is sufficiently flexible to recognise likely future changes in the NHS structure, and the necessary information structure to support such changes, the cultural barriers to optimal investment in information structures are more likely to be overcome. An example of such a change that needs to be taken into account is that, over time, NHS reforms have increasingly identified the importance of the role service users in being active participants in their health and social care.

It is a failure to deal with these more cultural problems, as well as the information shortfalls outlined in Section A which can explain the relative failure of previous information strategies.

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[12] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127443

Figure C.1: An analysis of which current information shortfalls were examined in information reviews since 1990

	Information asymmetry	**patient-level information accessible to the whole NHS**	**Information available to service users and healthcare professionals on medium to long-term patient outcomes**	**Internet based information provision is fragmented**	**Insufficient information to support choice**
Working for service users: Framework for Information Systems (1990)	Recognition that data should flow between NHS organisation	Recognition that investment was needed in national data flows and on national initiatives such as NHS Number	Promotion and use of the NHS Number would facilitate data linkage	Data not generally made available beyond high level statistics	
Getting Better with Information: An IM&T Strategy for the NHS in England (1992)	No reference to their differing information needs but all stakeholders recognised along with the need to share person based information across the NHS	Key principles promote the use of data from operational systems and sharing data to support a range of uses	As above, improved central systems and national data flows supports the availability of quality, more timely data which could be linked to outcomes	Service users recognised as stakeholders rather than information users	This period covers the establishment of the internal market and GPFH, but choice and information to support it limited
Information for Heath (1998)	All stakeholders recognised and whilst a National direction/ strategy was set local choice of system remained	National strategy set out the vision and way forward. Some functions delivered centrally where best done so, other investment was a local decision but within the longer term aims.	Improved national data flows would continue to improve the availability of data of better quality, which could be linked to outcomes	Limited information for service users	Patient choice information limited but improved data on providers for commissioners
Building the Information Core – Implementing the NHS Plan (2001)	Emphasises how IM&T would be used to support the whole of the NHS in care provision	Builds on above, promotes bigger picture for IM&T use i.e. call centres, on-line services	Outcomes research and monitoring would be supported as data standards improve	Increased recognition of the wider potential use of information for on-line services	Information for service users and clinicians remains mainly historic statistics
Delivering 21st Century IT Support for the NHS – National Strategic Programme (2002)	Concentration on central procurement of both national and local systems, lower recognition of local stakeholder needs	Central procurement of systems for local implementation promoted systems that would fit strategically but limited local choice meant local users not keen as local needs not recognised	Data flows to support NSFs and allow clinical audit etc and allow better access to data to look at outcomes	More data to be made more widely available is Dr Foster etc	Choice was impacted through Choose and Book project but uncertain as to what information there is to support this i.e. as a patient I would simply ask my GP which provider they recommend and then book it

D: Description of the policy options considered

Option 1: Do nothing

Under this option, the Government makes no further central interventions in the information infrastructure of the NHS and adult social care. Any subsequent changes to the health and social care information infrastructure will occur from local business needs.

Without central intervention, short-term developments in information systems are assumed to be ad-hoc additions to existing infrastructure or solutions to locally identified problems and opportunities. This approach focuses on the needs of immediate system users rather than benefits to the wider service or service users.

There is evidence that benefits are being achieved in response to the QIPP challenge by improving electronic transfer of information at a health economy level.[13] However, such investments in information transfer have only tended to serve the efficiency of individual agents (as discussed in section A). Therefore, recent and emerging policy acknowledges the need for broader service integration, in order to achieve further efficiency gains across the health and adult social care system. For example, the NHS White Paper identified the need for better integration of health and social care at all levels of the system to improve outcomes for service users (para 3.11). In the absence of central intervention, information developments are unlikely to be achievable at national level in the short to medium term. Implementation is likely to be coordinated within local and regional networks. The benefits of any integrated developments will be limited to those who access all health and care services within a pre-defined network.

It is unlikely that different IT providers will agree interoperability standards of their systems in the absence of specific requirements to do so. Open software standards could improve the transfer of information across system boundaries but is unclear if there is sufficient commercial interest in this area for it to be adopted without central intervention.

Under option 1, the information shortfalls identified in Section A, and the negative consequences of these, will persist and information fragmentation will persist. Local providers will invest on business cases which address important issues in the locality but which may not directly benefit the patient, other providers or improve our wider understanding of the effectiveness of individual providers.

Information fragmentation is likely to continue worsening under option 1 e.g. because there will be limited coordination of expanding web-based information, and this has significant implications for inequalities i.e. as information becomes more fragmented, the use of information by disadvantaged groups will also worsen, leading to decreasing health outcomes for disadvantaged groups and a widening of health inequalities. There is also likely

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[13] Informatics Innovation Delivering QIPP: Electronic Clinical Correspondence to GP, NHS North West.

to be no significant patient support function developed under option 1 to aid service users in utilising an increasingly fragmented information infrastructure, compounding the problems related to information fragmentation.

Another important consideration is that the combination of England's ageing population combined with the current financial pressures on both the NHS and social care are requiring efficiency improvements in both sectors. Therefore, greater integration, both within and across the health and care sectors, has been identified as an opportunity to ease cost pressures and improve quality. Technological advances provide an opportunity to underpin greater integration; however, without reform, technology will not be used to its best effect to support this efficiency challenge.

Option 2: (i) Ensure service users gain easier access to information, including a single on-line portal and on-line access to their records which they can share with others; (ii) Set standards which remove inappropriate barriers to sharing information within and across organisational boundaries; (iii) Over time, adopt standards which ensures, where appropriate, patient information is recorded once digitally in a form which encourages multiple secondary uses

Option 2 has three themes which will address both externality and information asymmetries using levers to increase the 'service user pull' by lowering the barriers to accessing trusted sources of general information and making it easier to view a user's individual records; reduce the barriers to sharing information across organisational boundaries for both the service user and professional benefit, making information available quicker and independent of setting; move to a position where care information is recorded electronically to agreed standards and wherever practicable using coding methods to increase connectivity and reuse.

The three themes for the scope of actions considered will be referred to as:

Theme 1 – Access to information to help service users to participate in *no decision about me without me*.

Theme 2 – Linking and sharing person based electronic records; comprising of:

i. standards;

ii. ensuring availability of person based information along care pathways at the point of care; and

iii. information derived from person based records.

Theme 3 – Capturing person based information at the point of care to enable effective and appropriate sharing of clinical and management information leading to real or virtual connectivity across different setting.

These themes are described in more detail below:

Theme 1 – Access to information to help service users to participate in *no decision about me without me*

The actions under this theme aim to stimulate service users to become more active in their care by giving them interactive communication and transactional capability with their GP practice, including access to their GP records on-line, with the ability to share the records with others. Benefits will be increased from this action if the mindset of health and social care professionals, the organisations that employ them and the design of the system recognises that health records are a fundamental part of *no decision about me without me*. Patients already have the right to access their GP record, either informally by asking for sight of the record, or formally by making a request for a printed copy. In the future, a patient wishing to take up the offer of having on-line access to their GP records should be encouraged to fully use the information to make more active decisions with their healthcare professionals.

To achieve the maximum benefit from this action, all clinical records should not only be technically accessible but also meaningful to the service user (or, with permission, others who will advise them such as a carer or next of kin) so they can participate fully in the commitment of *no decision about me without me.* Service users already have the right[14] to see their records in a form they can understand or have it explained to them: '*they should be written out in a form that you can understand. This means that abbreviations and complicated medical terms should be explained. If you still do not understand any part of the record, the health professional who is holding the record should explain it to you'.*[15]

It is anticipated that on-line access to records for service users will be in a form that enables them to make best use of the information and support will be provided for those who need it. The on-line access is also anticipated to be in a form which meets the service users' rights to protection of their data and the commitment to confidentiality in the NHS Constitution.

Key to the information asymmetry identified in section A is that additional benefit can be obtained by making clinical and care records available securely on-line to service users. However, enabling the access to records alone will be unlikely to be sufficient to change behaviour as identified by the Future Forum: '*We also heard that being given access to your record alone is not enough; patients need the support of their GP and access to information that supports their understanding of the data in their health record and which will allow them to better manage their own health'.*[16]

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[14] The Data Protection Act 1998 which gave domestic effect to the EU directive which talks about providing records in an understandable form which has generally been interpreted as plain english explanation of complex terms and concepts.

[15] http://www.nhs.uk/NHSEngland/thenhs/records/healthrecords/Pages/what_to_do.aspx

[16] http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_132086.pdf

Thus two impacts need to be observed if giving service users access to their records is to have a beneficial effect. Firstly, they must be able to understand them and secondly they have to change their behaviour as a result of the information that they have access to.

Early examples of allowing patients access to their records have been seen in primary care. In 2011 EMIS supplied clinical systems to 52.8% of GP practices in the UK. The EMIS ACCESS service launched in 2004 as part of the standard options for a practice, permits patients to book, cancel or change appointments, order repeat prescriptions, send secure messages and view medical records.[17] Of the 5,541 practices using the EMIS system in 2011, 57 pioneer practices had offered patients access to their records. By May 2011 there had been a total of 2,418 views of medical records through this system, 26% through a single practice in Tameside.

To help patients understand their records, the EMIS system uses the PAERS system which interfaces the READ coded patient record with a user- friendly viewer which shows information grouped into consultations, prescriptions, letters, demographic details, investigations results, allergies and vaccinations.[18] Importantly entries are automatically linked to patient information leaflets and web pages giving trusted sources of information relevant to the patient's diagnoses and medication. What is shown to the patient via a web portal is dynamically pulled from the practice database and not copied from a separate data repository. Any free text comments made on the patient record is not visible. Two of these practices have contributed information as a base for the costs and benefits table A1.

PAERS is one example of a supporting function adding value: the information that patients gather about themselves from their records has to be evaluated and used in context. In addition to a patient's own experiences and knowledge about health and care information from diverse sources available via the web has been increasingly used by the public to supplement or substitute for direct advice from healthcare professional. The NHS has been at the forefront of providing health advice via the web for over a decade. The NHS Choices web page offers a range of information about services available, medical conditions and treatment and better lifestyles. Over 15m people visit NHS Choices each year.

Actions in this theme will aim to increase service user access and engagement with their own records and an increasingly wide range of contextual information from NHS and other trusted sources. The transparency of the information available will incentivise providers to ensure the information is recorded using recommended standards and in a form that is useful to a wider range users than would otherwise been the case.

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[17] Fleming, P, S,.(2011), What factors contributing to the implementation and continued use of patients online access to records in early adopters GP surgeries. MSc dissertation, University of Central Lancashire.

[18] Fisher, B., Bhavnani, V. and Winfield, M.(2009) How patients use access to their full health records: a qualitative studey of patients in genral practice, J R Soc Med: 102: 538-544. http://www.pares.net

The benefits to the service users will come from a more collaborative approach to care between service users and their care providers. Providing such access in conjunction with interactive communication and transactional capability (e.g. appointment booking and ordering repeat prescriptions) offers them both convenience and time savings. For the provider the relationship between the medical professional and the service user should be less pedagogical, with the service user making fewer demands on professional care and taking greater ownership of their own health and wellbeing. QALY benefits should come from better service user satisfaction, reduced anxiety and stress associated with diagnosis, treatment and care and more appropriate interventions offered, with better compliance by service users with care programmes and increased and more effective self management of long term conditions.

The actions under this theme aim to stimulate the growing number of patients able to securely access their GP records on-line, with an ambition for access, by any patient who requests it, by April 2015.

The development of capability for individuals to locate, view, take copies of, coordinate and ultimately input to, all their care records, including secondary and social care, on-line via a secure identification process will be actively supported over the lifetime of this strategy, although it is not anticipated that this will have a significant impact until after April 2015. The approach to central support will be coordinated and led by the key national partners in the system, in particular the NHS Commissioning Board, Public Health England and the Social Care Directorate, in collaboration with professional bodies, technology industry leaders and local provider and commissioner bodies. Options to enable service users access are already being explored, including cross-Government initiatives to develop secure citizen access. The approach to this development will seek to identify and promulgate the adoption of most effective and value for money investment in technologies (such as ‘secure portals’ and other secure integration applications) at a system-wide level through appropriate incentives, levers and affordable central interventions and regulation to stimulate local action and market response.

Theme 2 – Linking and sharing person based information

Standards

Key to achieving integrated information flows, whether for person based care or for anonymised aggregated data, is the setting of appropriate information standards which are effectively implemented. Setting standards nationally will ensure that the sub-optimal investment currently identified in local business cases will be minimised by limiting investment choice to within a range of compliant solutions. Compliance with the information standards in effect sets one of the market entry points for providers to be able to become a willing providers of NHS care. *Note: The Wanless report made it clear that setting standards has to be done in conjunction with an assessment of the benefits that the investment to meet those standards will achieve.*

Setting the standards for the health and social care system will be a joint responsibility between the NHS Commissioning Board, Public Heath England and Social Care Directorate. This function will have to balance the benefits that imposing standards will achieve against any extra cost burden of compliance. The balance can be informed by involving a wider group including the professional bodies, users and IT supplier representation.

At this stage, we are also not able to predict the extent to which the incentive to legally enforce standards, a provision in the Health and Social Care Act 2012 could be used to enforce compliance with information standards. In this analysis we have assumed that standards and timescales are set in conjunction with providers to ensure a constant evolution towards access, secure sharing of information and system interoperability.

The examples used in *The power of information* have been used in this impact assessment to illustrate the costs and benefits that could be expected from addressing the six information shortfalls described in section A. At this stage the costs and benefits of improving the secure sharing of information across organisational boundaries are examples of those which may occur. The uncertainty of their delivery is due to:

i. the strategy advocating the delegation of the standards roadmap to bodies which are not yet fully operational. This dependency on delegated central powers is an additional risk caused by the new approach to central actions; and

ii. less confidence in developing new generation designs and processes in the current economic climate; existing designs are having their lifetimes extended.

Ensuring availability of person based information along care pathways at the point of care

Using the same approach outlined in theme 1 above, for providing service users with the capability to access their care record, capability will be developed to enable professionals to locate, view, filter and add to the information held in all health and care records. Such access will be developed within an appropriately secure environment and will build on and ultimately supersede, the capability already deployed by the Summary Care Record Service.

Benefits of inter-linking information across boundaries can include cash saving from the reduced administration of transferring information in paper form via post or messenger services. This is not only costly to do but inefficient in terms of time.

Information derived from person based records

Ensuring individual records about service users can be identified across provider boundaries and linked using the NHS number will increase the efficiency of information flows through NHS funded care, independent of setting. It will provide more accurate and timely data from which information appropriately aggregated and anonymised, for purposes such as commissioning, research, public health and operational management and planning can be derived, reducing the requirement for parallel collections of activity and outcomes data.

One possible delivery option would be to develop a locator service so that a portal approach to view records via a secure identification process will permit patient access over time to their records held by any NHS funded provider. Using the same infrastructure professionals will be able to locate and view records on patients. This may add additional detail to that currently held in the Summary Care Record Service, in time, the portal approach may replace it. There are already examples in several areas of the country of clinician portals for a local health community.

QALY benefits come from better integration of information flows within patient pathways and for patients with co-morbidities across pathways.

Theme 3 – Capturing person based information at the point of care to enable effective and appropriate sharing

Whereas in theme 2 the emphasis is on building the technical infrastructure between information sources to link existing records for both service user and professional use, theme 3 focuses on standardising the way person based care information is recorded in future to maximise the usability and value of the information for appropriate and legitimate primary and secondary use.

Using standardised methods of electronic recording and secure sharing across boundaries will permit the more efficient use of clinical time and reduce the opportunities for safety to be compromised. Standardised and direct entry of data into the information systems should also reduce errors and increase the value of information subsequently derived from the data.

We have estimated that between 10% and 20% of doctors' and front lines nurses' time is spent adding to, forwarding or reviewing patient data. This would mean that in addition to the £3bn/year spend on providing the infrastructure there could be a cost of twice this for clinical staff using the information held within clinical records. The Future Forum has stated that information is integral to high quality diagnosis, treatment and care for service users. Poor information can lead to sub-optimal clinical care and in particular can lead to errors and safety issues.

Health and care has tended to approach IM&T more in terms of the technical deployment of IT solutions and less about the workforce implications. In other settings such as banking and retail, the operations tend to be more tightly bound within the design of the IT solutions. Productivity gains in these sectors can be achieved by limiting the discretion of the workforce and embedding the knowledge needed within the functions of the technological system. For example, it is usually an algorithm embedded in the banking system which decides if a client is sufficiently credit worthy to merit a loan.

It is widely recognised that the complexity and the speed of progress of medical science means that healthcare professionals need increasing levels of information support to able to carry out their jobs reliability and efficiently. Currently information systems can enhance clinical performance for drug dosing, preventive care, and other aspects of medical care, but not convincingly for diagnosis.[19]

This requires a more systematic way in which clinical activities are recorded, using wherever possible, direct entry into collection devices and gradually phasing out paper based systems. Introducing change to recording information within clinical settings will require cultural change for both clinicians and the service users. In additional to leadership it will involve support from provider organisations, professional bodies and patient groups.

Influencing how medical professionals make best use of information and in particular encouraging them to make the best use of emerging solutions can be difficult. This barrier to progress can be the most acute when there are conflicting pressures on time and resources. This is why the Future Forum has identified the need to get full clinical engagement with proposed changes before a programme is started.

The successful implementation of the Veterans Administration (VA) clinical information system is attributed in part to the specification was led by the clinical teams rather than it being undertaken as a technical task. Even with a strong clinical leadership the Veterans Health Information Systems and Technology Architecture (VistA) has taken over 40 years to develop but over that time it played a key role in the transformation of the service from one which had a poor reputation in the 1960's to one which is widely regarded now as the gold standard of healthcare provision.

The commitment from Monitor suggests that information standards could be tightly regulated to enforce compliance. However, this might only be successful if the standards are widely accepted by those who have to use them.

Delivery options for each of the themes

The Department has a range of delivery options available to it to achieve the benefits that are anticipated by addressing the failures identified in the problem section. Table D1 shows the ladder of interventions that have historically been used to align information in the NHS.

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[19] Hunt DL, Haynes RB, Hanna SE, Smith K, Effects of computer-based clinical decision support systems on physician performance and patient outcome: a systematic review. JAMA 1998 Oct 21; 280 (15):1339-46.

Table D1: The ladder of interventions available to achieve policy objectives in IM&T

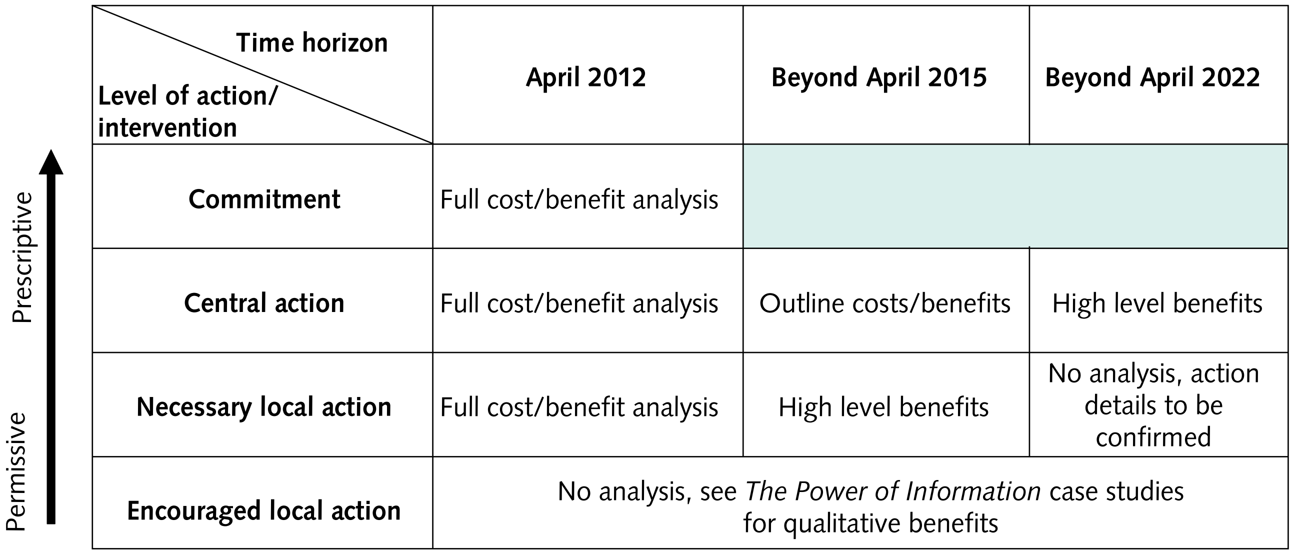
Intervention level	**Examples of scope using actions and activities**	**Examples of how Department has managed these approaches**
Centrally managed and funded	NPfIT, NHS Spine, Chose and Book, GPSoC	Central delivery board accountable to the Department
Framework approach	Operating framework, NHS number, SUS	Performance management, financial incentives, for example best practice tariff
Tightly regulated standards	Professional access to records, patient identifiable records	Sanctions by regulating body
Loosely regulated standards	Data collections of non-patient identifiable information	Sanctions by commissioners
Direction setting, evidence base and support	Policy direction; Support of third party bodies, for example cancer charities	Funding support
No intervention	Secondary use, For example analysis of NHS prescription use	Market making

The table shows the spectrum of approaches that have been use in the past to incentivise the use of information for the efficient running of a complex organisation both from the perspective of the tax payer and the services users. In the past central direction has attempted to exert pace or maintain financial control through programmes or strong performance management. The new delegated approach is to intervene only to the lowest level required and engage other tools such as behavioural economics, psychology and targeted communication to motivate change in individual behaviours as well as at organisational level. Option 2 starts from the position that the lowest level on the intervention ladder should be used unless there is evidence to show that it is likely to fail to address the problem identified. Non-compliance or slow adoption has been dealt with in this IA as a risk.

To support local organisations to deliver the strategy, the centre will develop clinically led roadmaps to promote the greater use of information in shared decision making and developing standards around storing and sharing data.

The approach taken in *The Power of Information* is to be more prescriptive for actions required in the short term (pre-2015/16), and less prescriptive for impacts in the longer term. The two commitments in the strategy, as outlined above, are required to be implemented by 2015. The estimation of costs and benefits follows this approach, reflecting several considerations, including: possible changes in the requirements for the information infrastructure in the longer term (see Section C), uncertainties surrounding resources available for IM&T expenditure post 2015, and uncertainties regarding decisions to be made by a reformed NHS structure. The approach taken in this impact assessment is illustrated in Figure D.1.

Figure D.1 The approach used in the cost benefit analysis



Time horizon / Level of action/ intervention	April 2012	Beyond April 2015	Beyond April 2022
Commitment	Full cost/benefit analysis		
Central action	Full cost/benefit analysis	Outline costs/benefits	High level benefits
Necessary local action	Full cost/benefit analysis	High level benefits	No analysis, action details to be confirmed
Encouraged local action	No analysis, see *The Power of Information* case studies for qualitative benefits		

In this impact assessment, full cost benefit analysis is made for the commitments, central actions and necessary local actions implemented in the short term. In year 3 of implementation of this new strategy, it is proposed to review and appraise progress in implementation, and to complete a full appraisal of the actions occurring in the next period, beyond April 2015.

Option 2 theme 1 – Summary of Actions

The policy in theme 1 aims to increase patient participation by having access initially to their GP records and quality assured health and social care information. Over time they will gain access to their records held in other parts of the health and social care system. In addition, the *NHS Information Centre* will provide a secure data linkage service, complemented by the research data linkage service. Table D2 lists the actions under theme 1.

Table D2: The actions from under theme 1

Theme 1 Information to help service users to participate in no decision about me without me	Problem area and level of intervention to address it	Anticipated impact
Commitment		
1. All NHS Patients will have secure online access, where they wish it, to their personal GP records by 2015 (by the end of this Parliament) By 2015, all general practices will be expected to make available electronic booking and cancelling of appointments, ordering of repeat prescriptions, communication with the practice and access to records to anyone registered with the practice that requests these services	1, 3, 4, 5 and 6 Tightly regulated standards	Better informed patients who can participate in NDAMWM

Theme 1 Information to help service users to participate in no decision about me without me	Problem area and level of intervention to address it	Anticipated impact
Central action		
3. Patients will be able to view online which GP Practices offer online access to records by 2013	1 and 3 Loosely regulated standards	Enable progress to commitment to be monitored
4. The Government has asked the Royal College of General Practitioners, working in partnership with patient groups and other professional organisations to lead development of a plan, policy and procedures to support patient access and engagement with their GP records	1, 3 and 5 Tightly regulated standards	Better informed patients who can participate in NDAMWM, including being given support to understand and take the appropriate action on information
5. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • Identification and authentication of patients and service users, in conjunction with other public services; **10.** The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	1, 2 5 and 6 Direction setting	Enable patients to share records
6. Intellect has agreed to work with the Department of Health, NHS Commissioning Board and Public Health England to develop the evidence case for a 'portal' approach to patient and professional secure viewing of appropriate health and care records and information online	2, 3, 4, 5 and 6 Framework approach/ Loosely regulated standards	By providing web portals patients will be able to view a wide range of their clinical records will be better informed patients who can participate in NDAMWM
7. The NHS Commissioning Board will consider publishing commissioning guidance for support to assist patients to make the best use of the information provided	1, 3, 4 and 5 Direction setting	The redirection of local funds to provide support to patients
11. The Department of Health will sponsor the provision of a comprehensive online 'portal' – to bring together the best of the relevant information on health, public health and care and support	1, 3, 4 and 5 Loosely regulated standards	Reduce duplication of supply
12. The Department of Health and other central bodies will, over time, stop providing certain information where this is better done by the market. For instance, we will no longer provide patient comment – instead we will show patient comment from a number of routes	4 Loosely regulated standards	The centre wants to stimulate the provision

Theme 1 Information to help service users to participate in no decision about me without me	**Problem area and level of intervention to address it**	**Anticipated impact**
13. The Department of Health and the NHS Commissioning Board will bring together representatives from the voluntary sector, health and care professions and industry, to consider how to increase health literacy and support information producers to communicate effectively in ways that are meaningful to us as citizens, patients and service users	4 Direction setting	Decrease the digital divide which could otherwise increase health inequalities
14. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders will, in line with the roadmap for the health and care sector to make all data open, and to continue to improve the information available to better support transparency and patient choice, this will include: • simpler health and care performance metrics on the online portal • the Health and Social Care Information Centre publishing all nationally held clinical data by April 2014, where possible by clinical team • The Health and Social Care Information Centre publishing assessments of the quality of data it makes available	1, 3, 4 and 5 Loosely regulated standards	Simplified information on which service used can make choice decisions
Necessary local action		
23. NHS organisations should actively seek out, respond positively and improve services in line with patient feedback. This includes acting on complaints, users' comments, local and national surveys and results from 'real time' data techniques	1, 3 and 5 Direction setting	Patient feedback will improve provider response to user choice
26. During 2012/13, in line with expectations in the NHS Operating Framework, the NHS will work towards implementing the 'Friends and Family Test' – a simple test where patients will be asked an easy-to-understand question about the care provided – with SHA clusters, including Midlands and East who are implementing a coordinated scheme, to share tools and know-how.	3 Loosely regulated standards	Additional patient feedback will improve provider response to user choice.

The NHS CB will be expected to evaluate in detail the cost and benefits of proposals for which it will be responsible for delivering. However, the best estimates at this stage suggest that this commitment would only a small extra burden to central and locally devolved budgets, which will be funded by transferring funding from the existing central function. We estimate that this represents a total of approximately £100,000 per annum.

Option 2 theme 2 – Summary of Actions

The approach is based on setting standards of information recording and sharing. In addition the clinical benefit of having patient records linked to give a richer picture of the whole patient journey improving the electronic transfer of data has potentially many cost saving benefits, including the reduction of manual back office activities.

The approach taken in option 2 is to set standards in key areas to ensure providers adopt systems which are untimely inter-operable with any other health and social care provider. Adding the infrastructure to inter-link records and make them available anywhere will also be an essential step in extending the ability of service users to view and share all their records.

Initially the actions will involve setting a roadmap to the way standards will be developed in the future.. Monitor plans to explore how those powers can be used to protect and promote the interest of people who use health care services. Monitor, the CB and the IC will have to adopt systems to permit this to work in practice. Table D3 lists the actions under theme 2.

Table D3: The actions under theme 2

THEME 2 Crossing clinical information boundaries	**Information shortfall and level of intervention to address t**	**Anticipated impact**
Commitment		
2. All patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers *some exceptions apply, for example small voluntary organisations and for specific public health services	2, 3 and 6 Tightly regulated standards	To enable the joining of records
Central action		
5. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • capability to enable service users and service professionals to locate accessible electronic records held by all the services which service users have used • ways of sharing electronic copies of service user records with people and organisations of service users' choice who can help in understanding and managing service users' health and care	2, 3 and 6 Direction setting	Enable the inter-linking of records across organisations

THEME 2 Crossing clinical information boundaries	Information shortfall and level of intervention to address t	Anticipated impact
6. Intellect has agreed to work with the Department of Health, NHS Commissioning Board and Public Health England to develop the evidence case for a 'portal' approach to patient and professional secure viewing of appropriate health and care records and information online	2, 3, 4, 5 & 6 Framework approach/ Loosely regulated standards	Use a industry driven approach to inter-link records across boundaries
9. All providers of NHS funded care (including Social Enterprises and AQPs), as part of their commissioning contracts with the NHS, will be given access to NHSmail accounts or other encryption tools to facilitate secure communication, where this is cost effective	2 and 6 Centrally managed and funded	Enable the inter-linking of records across organisations
15. The NHS Commissioning Board will lead and coordinate work on developing commissioning data sets (the main data collection from secondary care) to allow data returns in SNOMED CT from April 2014	This is a first step towards collecting all central information from clinical information (rather than transcribing information from clinical records for central returns) Framework approach	Eventually, this approach will lead to reduced administration and a broader and more useful set of clinical information available at national level
16. The Department of Health and the Health and Social Care Information Centre will work with stakeholders to investigate reducing the administrative burden of gathering social care information for national use	Framework approach	Reduce the cost of data extraction/ submission
19. The Department of Health will support a number of NHS trailblazer trusts in 2012 with improved adoption of new technologies in maternity services, including the development and use of necessary standards	2 Direction setting	Provide incentives to adopt new interactions
Necessary Local Action		
24. Providers and Commissioners should communicate electronically rather than using the post where possible – minimising the delay in treatment pathways and reducing manual processes	2 Direction setting	Quicker and cheaper transfer of information

THEME 2 Crossing clinical information boundaries	Information shortfall and level of intervention to address t	Anticipated impact
Providers and Commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions. **(including 8)** The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information including: • unique identifier – NHS number • terminology (including pathology and diagnostic imaging, medicines and devices, and clinical coding language) • best practice information governance and management	1, 2, 5 and 6 Loosely regulated standards	Enable the infrastructure to view records across boundaries

The strategy to 'connect all' rather than 'replace all' endorsed in the government White Paper, '*Equity & Excellence: Liberating the NHS*' signalled the intention to move to an interlinked and interconnected IT infrastructure within the NHS. The "connect all" approach is currently supported by the Connecting for Health Interoperability Toolkit (ITK). This aims to link systems using internationally recognised standards

Option 2 theme 3 – Summary of Actions

Theme 3 clearly signals that paper based record keeping should only be used in exceptional circumstances. It also requires providers to move to recording systems, which use coding systems which make it simpler to extract and summarise records. Ultimately, individual records should be able to be connected to form a pathway record, which supports wide range data extractions for management and clinical needs. Table D4 lists the actions under theme 3.

Table D4: The actions under theme 3

THEME 3 The right clinical information following the service user	Information shortfall and level of intervention to address it	Anticipated impact
Commitment		
2. All patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers *some exceptions apply, for example small voluntary organisations and for specific public health services	2, 3 and 6 Tightly regulated standards	To enable the joining of records
Central Actions		
18. The Department of Health and NHS Commissioning Board will work to pilot new ways to incentivise the use of integrated barcode medication administration systems in care homes by September 2014, including the use of Social Impact Bonds, with the results informing future plans for implementation across England	2 and 4 Direction setting, evidence base and support	Provide direction and incentives for better use of IT across social care
Necessary local actions		
8. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information including: • Professional record keeping – (for instance the academy of medical royal colleges records standards and social care assessment) • Best practice information governance and management	1,2, 3 5 and 6 Direction setting	The reduction over time of paper records and the adoption of coding systems to permit inter-connectivity
20. A senior Clinician or Care Professional responsible for taking the lead in ensuring that information is organised and utilised effectively in support of better patient care should be identified in every organisation	1,2, 3 5 and 6 Direction setting	To give clear clinical leadership for a move to electronic record keeping and making the best use of IM&T investment
21. Commissioners and Regulators should, through regulatory and contract frameworks, assure that information system procurement decisions are underpinned by robust business cases which ensure effective VFM and benefits realisation and that are in line with published information standards	1,2, 3 5 and 6 Loosely regulated standards (or tightly regulated standards if needed)	Invest in the infrastructure to support an inter-linked and eventually interconnect patient records

THEME 3 The right clinical information following the service user	Information shortfall and level of intervention to address it	Anticipated impact
23. Providers should ensure they assess the capability and meet the training needs of their clinical and care professionals in the best practice use of information as part of their routine development planning	1,2, 3 5 and 6 Direction setting	Invest in staff to support an inter-linked and eventually interconnect patient records

Costs and benefits of option 2

Tables A to C show the financial costs, opportunity costs and benefits for option 2:

Table A: The financial costs of option 2

	Years of impact	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital	10	1.3	1.8	2.4	1.8	1.8	1.8	1.9	1.9	2.0	2.0	18.8
Revenue costs												
Revenue	10	20.26	24.17	31.20	30.41	38.86	42.05	45.27	49.03	52.58	58.58	392.41
Irrecoverable tax	0											–
Cash-releasing savings	10	-58.35	-87.76	-118.57	-164.76	-217.19	-283.75	-369.13	-488.55	-641.29	-819.07	-3,248.44
Net revenue costs	*10*	*-38.09*	*-63.59*	*-87.37*	*-134.35*	*-178.33*	*-241.71*	*-323.86*	*-439.53*	*-588.71*	*-760.50*	*-2,856.03*
Central budgets (DH/NHS CB)												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	9	–	0.66	11.86	17.40	23.16	29.15	29.73	30.33	30.93	31.55	204.78
Irrecoverable tax	0											-
Cash-releasing savings	10	–	-	-1.04	-1.06	-1.08	-1.10	-1.13	-1.15	-1.17	-1.20	-8.93
Net revenue costs	*9*	–	*0.66*	*10.82*	*16.34*	*22.08*	*28.04*	*28.60*	*29.18*	*29.76*	*30.36*	*195.85*
Local Authorities												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	10	0.8	0.8	1.4	2.2	2.6	3.0	3.4	3.4	1.8	1.8	21.2
Irrecoverable tax	0											–
Cash-releasing savings	0	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*10*	*0.8*	*0.8*	*1.4*	*2.2*	*2.6*	*3.0*	*3.4*	*3.4*	*1.8*	*1.8*	*21.2*
Regional Government Offices												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	0	–	–	–	–	–	–	–	–	–	–	–
Irrecoverable tax	0											–
Cash-releasing savings	0	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*0*	–	–	–	–	–	–	–	–	–	–	–

Table B: The opportunity costs of option 2

		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital		1.3	1.8	2.3	1.7	1.7	1.7	1.7	1.7	1.7	1.7	17.1
Capital depreciation	4.0%		3.1	5.3	6.7	8.1	9.5	10.8	12.0	13.2	14.3	13.8
Capital charge	3.5%	–	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	2.9
NPV capital		**–**	**3.1**	**5.1**	**6.3**	**7.3**	**8.3**	**9.1**	**9.8**	**10.4**	**10.9**	**70.1**
Revenue costs												
Revenue		20.3	23.7	30.0	28.7	35.9	38.1	40.2	42.7	44.9	49.0	353.4
Cost savings		-58.4	-86.0	-114.0	-155.3	-200.6	-257.0	-327.8	-425.3	-547.3	-685.4	-2,857.1
Net revenue costs		*-38.1*	*-62.3*	*-84.0*	*-126.6*	*-164.8*	*-218.9*	*-287.6*	*-382.6*	*-502.5*	*-636.3*	*-2,503.7*
NPV revenue		**-38.1**	**-60.2**	**-78.4**	**-114.2**	**-143.6**	**-184.3**	**-233.9**	**-300.7**	**-381.6**	**-466.9**	**-2,002.0**
Central budgets (DH/NHS CB)												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		–	0.7	11.4	16.4	21.4	26.4	26.4	26.4	26.4	26.4	181.9
Cost savings		–	-	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-8.0
Net revenue costs		–	*0.7*	*10.4*	*15.4*	*20.4*	*25.4*	*25.4*	*25.4*	*25.4*	*25.4*	*173.9*
NPV revenue		**–**	**0.6**	**9.7**	**13.9**	**17.8**	**21.4**	**20.7**	**20.0**	**19.3**	**18.6**	**141.9**
Local Authorities												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		0.8	0.8	1.3	2.1	2.4	2.7	3.0	3.0	1.5	1.5	19.1
Cost savings		–	–	–	–	–	–	–	–	–	–	–
Net revenue costs		*0.8*	*0.8*	*1.3*	*2.1*	*2.4*	*2.7*	*3.0*	*3.0*	*1.5*	*1.5*	*19.1*
NPV revenue		**0.8**	**0.8**	**1.2**	**1.9**	**2.1**	**2.3**	**2.4**	**2.4**	**1.1**	**1.1**	**16.1**
Opportunity costs												
Opportunity costs		50.55	67.94	115.51	129.88	163.46	184.77	193.79	202.82	207.46	220.23	1,536.4
Value of cost savings		-140.04	-206.50	-275.92	-375.03	-483.96	-619.21	-789.07				-6,876.2
Total costs		**21.06**	**28.31**	**48.13**	**54.12**	**68.11**	**76.99**	**80.75**	**84.51**	**86.44**	**91.76**	**640.2**
Total Cost savings		**-58.35**	**-86.04**	**-114.97**	**-156.26**	**-201.65**	**-258.00**	**-328.78**	**-426.31**	**-548.34**	**-686.36**	**-2,865.1**
Costs (counting captial not depr & charge)		**22.40**	**26.92**	**45.02**	**48.83**	**61.37**	**68.86**	**71.27**	**73.75**	**74.45**	**78.59**	**571.5**

Table C: The non-QALY benefits of option 2

		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Non-exchequer impact												
Non-exchequer costs												–
Cash-releasing Cost savings		–	–	–	–	–	–	–	–	–	–	–
Non-cash releasing Cost savings												
	QALYs	-42.91	-46.66	-51.47	-58.56	-68.54	-82.55	-104.07	-135.37	-177.06	-215.12	-982.3
	Other	–	–	–	–	–	–	–	–	–	–	–
Total Cost savings		*-42.91*	*-46.66*	*-51.47*	*-58.56*	*-68.54*	*-82.55*	*-104.07*	*-135.37*	*-177.06*	*-215.12*	*-982.3*
Total social impact		*-42.91*	*-46.66*	*-51.47*	*-58.56*	*-68.54*	*-82.55*	*-104.07*	*-135.37*	*-177.06*	*-215.12*	*-982.3*
NPV social impact		**-42.91**	**-45.08**	**-48.05**	**-52.82**	**-59.73**	**-69.50**	**-84.66**	**-106.40**	**-134.46**	**-157.84**	**-801.5**

The following sections outline the approaches taken to estimating the costs, non-QALY benefits (e.g. cash releasing savings, increases in productivity) and QALY benefits of option 2. Costs and non-QALY benefits are further broken-down by theme. The accompanying spreadsheet to this Impact Assessment gives the full breakdown by action as well as showing all calculations and assumptions.

Costs and non-QALY benefits of option 2

Annex A of *The power of information* summarises the actions set out in the strategy. This list of actions is used as the basis to value the costs and benefits of the strategy set out below. The actions are divided between the themes set out in this IA and are grouped where necessary to illustrate where several supporting actions are required to deliver the benefits identified. Where actions underpin multiple themes, the costs and benefits have been apportioned accordingly and are referenced below.

The approach taken to estimate costs of the action in option 2 was to collect evidence range of sources and scale them to meet levels of ambition assuming the desired effect was fully achieved. Only costs and benefits from the central and local committed actions have been considered. A range of locally encouraged action in option 2 have not been included in this analysis. The evidence base has included:

i. business cases for similar previous projects including the Summary Care Record, NHS Choices, NHS Mail and integrated social care systems;
ii. international evidence of the cost benefit of large scale integrated health record systems;
iii. published evidence on patient access to records on-line;
iv. evidence from the pilot sites offering patient access to records;
v. evidence from the IT industry including Intellect;
vi. hospital activity and cost data;
vii. Personal Social Services Research Unit (PSSRU) costing data for primary and community care; and
viii. research commissioned for this project from the Technical Office of the Department of Health Information Directorate (DHID).[20]

The cash releasing benefits resulting from the actions in option 2 have been estimated using plausible efficiency gains and demand reduction estimates in-line with previous business cases and impact assessments.

It should be noted that the opportunity costs in the tables in the following sections are calculated by multiplying the exchequer costs of the themes/actions by 2.4. This is done to take into account the fact that the value of the benefits produced by the NHS are estimated to be 2.4 times greater than the marginal cost of producing them.

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[20] Information Strategy Fact Base, 30 March 2012, DHID; a copy of which will be lodged in the Department of Health library.

Costs and non QALY benefits of theme 1

Tables A1 to C1 display the costs and non-QALY benefits of the actions under theme 1, aggregated to theme level. The accompanying spreadsheet details both the costs and non-QALY benefits at specific action level as well as the working and assumptions behind these calculations. Table 1 displays the specific actions within theme 1.

Table 1: Actions and the proportion of costs attributed to theme 1

Action		Proportion contribution to theme
No.	Description	
1	All NHS patients will have secure online access, where they wish it, to their personal GP records by 2015 (by the end of this Parliament). By 2015, all general practices will be expected to make available electronic booking and cancelling of appointments, ordering of repeat prescriptions, communication with the practice and access to records to anyone registered with the practice that requests these services	100%
3	Patients will be able to view online which GP Practices offer online access to records by 2013	100%
4	The Government has asked the Royal College of General Practitioners, working in partnership with patient groups and other professional organisations to lead development of a plan, policy and procedures to support patient access and engagement with their GP records	100%
5	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • identification and authentication of patients and service users, in conjunction with other public services • capability to enable service users and service professionals to locate accessible electronic records held by all the services which service users have used • ways of sharing electronic copies of service users' records with people and organisations of service users' choice who can help in understanding and managing service users' health and care	33%
7	The NHS Commissioning Board will consider publishing commissioning guidance for support to assist patients to make the best use of the information provided	100%
10	The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	33%
13	The Department of Health and the NHS Commissioning Board will bring together representatives from the voluntary sector, health and care professions and industry, to consider how to increase health literacy and support information producers to communicate effectively in ways that are meaningful to us as citizens, patients and service users	100%

Action		**Proportion contribution to theme**
No.	**Description**	
14	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders will, in line with the roadmap for the health and care sector to make all data open, and to continue to improve the information available to better support transparency and patient choice, this will include: • simpler health and care performance metrics on the online portal • the Health and Social Care Information Centre publishing all nationally held clinical data by April 2014, where possible by clinical team • the Health and Social Care Information Centre publishing assessments of the quality of data it makes available	100%
23	NHS organisations should actively seek out, respond positively and improve services in line with patient feedback. This includes acting on complaints, users' comments, local and national surveys and results from 'real time' data techniques	100%
26	During 2012/13, in line with expectations in the NHS Operating Framework, the NHS will work towards implementing the 'Friends and Family Test' – a simple test where patients will be asked an easy-to-understand question about the care provided – with SHA clusters, including Midlands and East who are implementing a coordinated scheme, to share tools and know-how	100%

Table A1: The financial costs of theme 1

	Years of impact	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital	10	1.0	1.2	1.6	1.9	1.3	1.3	1.3	1.3	1.4	1.4	13.8
Revenue costs												
Revenue	10	6.49	9.03	13.80	15.53	14.91	17.49	20.84	25.22	30.93	38.41	192.66
Irrecoverable tax	0											
Cash-releasing savings	10	–	–30.78	–41.85	–57.93	–74.95	–97.35	–126.83	–165.64	–216.74	–284.01	–1,096.09
Net revenue costs	*10*	*–6.49*	*–21.74*	*–28.05*	*–42.40*	*–60.04*	*–79.86*	*–105.99*	*–140.43*	*–185.81*	*–245.60*	*–903.43*
Central budgets (DH/NHS CB)												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	9	–	0.51	24.19	29.98	35.99	42.23	43.08	43.94	44.82	45.71	310.44
Irrecoverable tax	0											
Cash-releasing savings	10	–	–	27.40	27.95	28.51	29.08	29.66	30.25	30.86	31.48	235.19
Net revenue costs	*8*	–	*0.51*	*–3.21*	*2.03*	*7.48*	*13.15*	*13.41*	*13.68*	*13.96*	*14.24*	*75.25*

Table B1: The opportunity costs of theme 1

		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital		1.0	1.2	1.5	1.8	1.2	1.2	1.2	1.2	1.2	1.2	12.6
Capital depreciation	4.0%		2.2	3.7	5.3	6.3	7.2	8.1	8.9	9.7	10.5	10.1
Capital charge	3.5%	–	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	2.2
NPV capital		**–**	**2.2**	**3.5**	**5.0**	**5.7**	**6.3**	**6.8**	**7.3**	**7.7**	**8.0**	**52.3**
Revenue costs												
Revenue		6.5	8.9	13.3	14.6	13.8	15.8	18.5	22.0	26.4	32.1	171.9
Cost savings		–	–30.2	–40.2	–54.6	–69.2	–88.2	–112.6	–144.2	–185.0	–237.7	–961.9
Net revenue costs		*6.5*	*–21.3*	*–27.0*	*–40.0*	*–55.5*	*–72.3*	*–94.1*	*–122.3*	*–158.6*	*–205.5*	*–790.0*
NPV revenue		**6.5**	**–20.6**	**–25.2**	**–36.0**	**–48.3**	**–60.9**	**–76.6**	**–96.1**	**–120.4**	**–150.8**	**–628.4**
Central budgets (DH/NHS CB)												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		–	0.5	23.3	28.3	33.3	38.3	38.3	38.3	38.3	38.3	276.5
Cost savings		–	–	–26.3	–26.3	–26.3	–26.3	–26.3	–26.3	–26.3	–26.3	–210.7
Net revenue costs		–	*0.5*	*–3.1*	*1.9*	*6.9*	*11.9*	*11.9*	*11.9*	*11.9*	*11.9*	*65.8*
NPV revenue		**–**	**0.5**	**–2.9**	**1.7**	**6.0**	**10.0**	**9.7**	**9.4**	**9.0**	**8.7**	**52.2**
Opportunity costs												
Opportunity costs		15.58	27.99	96.72	116.13	128.45	147.69	156.28	166.64	179.33	195.06	1,229.9
Value of cost savings		–	–72.41	–159.76	–194.22	–229.40	–274.83	–333.51	–409.30	–507.17	–633.57	–2,814.2

The main costs associated with providing information to help service users participate are in providing online access to GP records (action 1) and later all health care records (action 5).

Theme 1 delivers the largest benefits of the strategy. The biggest group of benefits comes is based on evidence from a pilot stud of online access to GP records which concludes that on-line access to GP records will generate time savings to GP practices as patients can access their personal information directly. The savings will be realised through reduced patient contacts with GPs, nurses and healthcare assistants, both face-to-face and over the phone.

The NHS CB will be responsible for delivering action 13 (see table 1 above). Detailed costs and benefits of this action cannot be assessed at this stage as the NHS CB is not yet fully operational. While the best estimates at this stage suggest that this action will not place a significant burden on central and locally devolved budgets, the NHS CB will be expected to evaluate in detail the cost and benefits of proposals for which it will be responsible for delivering.

Costs and non QALY benefits of theme 2

Tables A2 to C2 display the costs and non-QALY benefits of the actions under theme 2, aggregated to theme level. The accompanying spreadsheet details both the costs and non-QALY benefits at specific action level as well as the working and assumptions behind these calculations. Table 2 displays the specific actions within theme 2.

Table 2: Actions and the proportion of costs attributed to theme 2

Action		Proportion contribution to theme
No.	**Description**	
2	All Patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers. *some exceptions apply, for example small voluntary organisations and for specific public health services	40%
5	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • identification and authentication of patients and service users, in conjunction with other public services • capability to enable service users and service professionals to locate accessible electronic records held by all the services which service users have used • ways of sharing electronic copies of service users' records with people and organisations of service users' choice who can help in understanding and managing service users' health and care	33%
6	Intellect has agreed to work with the Department of Health, NHS Commissioning Board and Public Health England to develop the evidence case for a 'portal' approach to patient and professional secure viewing of appropriate health and care records and information online	100%
8	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information including: • unique identifier – NHS number • terminology (including pathology and diagnostic imaging, medicines and devices, and clinical coding language) • professional record keeping – (for instance the academy of medical royal colleges records standards and social care assessment) • best practice information governance and management.	60%
9	All providers of NHS funded care (including Social Enterprises and AQPs), as part of their commissioning contracts with the NHS, will be given access to NHSmail accounts or other encryption tools to facilitate secure communication, where this is cost effective	100%
10	The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	33%
11	The Department of Health will sponsor the provision of a comprehensive online 'portal' – to bring together the best of the relevant information on health, public health and care and support	100%

Action		**Proportion contribution to theme**
No.	**Description**	
12	The Department of Health and other central bodies will, over time, stop providing certain information where this is better done by the market. For instance, we will no longer provide patient comment – instead we will show patient comment from a number of routes	100%
15	The NHS Commissioning Board will lead and coordinate work on developing commissioning data sets (the main data collection from secondary care) to allow data returns in SNOMED CT from April 2014	100%
16	The Department of Health and the Health and Social Care Information Centre will work with stakeholders to investigate reducing the administrative burden of gathering social care information for national use	100%
17	The Health and Social Care Information Centre will provide a secure data linkage service, complemented by the research data linkage service, this will be in place September 2012	100%
19	The Department of Health will support a number of NHS trailblazer trusts in 2012 with improved adoption of new technologies in maternity services, including the development and use of necessary standards	100%
24	Providers and commissioners should communicate electronically rather than using the post where possible – minimising the delay in treatment pathways and reducing manual processes	100%
25	Providers and commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions	60%

Table A2: The financial costs of theme 2

	Years of impact	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**Total**
NHS												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	10	0.60	6.26	6.73	3.11	23.16	23.63	23.87	24.35	24.37	24.86	160.94
Irrecoverable tax	0	–	–	–	–	–	–	–	–	–	–	–
Cash-releasing savings	10	–	–5.10	–10.40	–21.22	–32.47	–33.12	–33.78	–34.46	–35.15	–35.85	–241.57
Net revenue costs	*10*	*0.60*	*1.16*	*–3.68*	*–18.11*	*–9.31*	*–9.50*	*–9.91*	*–10.11*	*–10.78*	*–10.99*	*–80.63*
Central budgets (DH/NHS CB)												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	9	–	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18	1.49
Irrecoverable tax	0	–	–	–	–	–	–	–	–	–	–	–
Cash-releasing savings	10	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*9*	–	*0.15*	*0.16*	*0.16*	*0.16*	*0.17*	*0.17*	*0.17*	*0.18*	*0.18*	*1.49*
Local authorities												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	8	0.2	0.2	0.4	0.6	0.6	0.7	0.7	0.7	–	–	4.1
Irrecoverable tax	0											
Cash-releasing savings	0	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*8*	*0.2*	*0.2*	*0.4*	*0.6*	*0.6*	*0.7*	*0.7*	*0.7*	–	–	*4.1*

Table B2: The opportunity costs of theme 2

		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		0.6	6.1	6.5	2.9	21.4	21.4	21.2	21.2	20.8	20.8	142.9
Cost savings		–	–5.0	–10.0	–20.0	–30.0	–30.0	–30.0	–30.0	–30.0	–30.0	215.0
Net revenue costs		*0.6*	*1.1*	*–3.5*	*–17.1*	*–8.6*	*–8.6*	*–8.8*	*–8.8*	*–9.2*	*–9.2*	*–72.1*
NPV revenue		**0.6**	**1.1**	**–3.3**	**–15.4**	**–7.5**	**–7.2**	**–7.2**	**–6.9**	**–7.0**	**–6.8**	**–59.5**
Central budgets (DH/NHS CB)												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		–	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.4
Cost savings		–	–	–	–	–	–	–	–	–	–	–
Net revenue costs		–	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*1.4*
NPV revenue		**–**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**1.1**
Local authorities												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		0.2	0.2	0.4	0.6	0.6	0.6	0.6	0.6	–	–	3.8
Cost savings		–	–	–	–	–	–	–	–	–	–	–
Net revenue costs		*0.2*	*0.2*	*0.4*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	–	–	*3.8*
NPV revenue		**0.2**	**0.2**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**–**	**–**	**3.3**
Opportunity costs												
Opportunity costs		1.92	15.56	16.84	8.84	53.16	53.16	52.68	52.68	50.28	50.28	355.4
Value of cost savings		–	–12.00	–24.00	–48.00	–72.00	–72.00	–72.00	–72.00	–72.00	–72.00	–516.0

Many of the actions in theme 2 focus on the implementation of existing cental and local commitments and do not place an additional cost burden on central or local health and care organisations relative to the do nothing position.

The main costs of theme 2 are infrastructure requirements to enable information to be shared between settings. Extending the use of the NHS number for wider use in more settings requires changes to the way that data is captured. To enable patient information to be shared securely across clinical boundaries, all NHS providers will be given access to a secure messaging system (for example NHS Mail). In some cases, health and care providers will also require upgrades to their current technology through the procurement of clinical correspondence systems.

The quantified benefits of sharing clinical information across boundaries will be realised through reductions in the transfer of paper records. This saving includes the administration costs associated with the preparation of mail, such as transcribing clinical notes for referral letters, and the postal costs of transferring paper documents.

Costs and non QALY benefits of theme 3

Tables A3 to C3 display the costs and non-QALY benefits of the actions under theme 3, aggregated to theme level. The accompanying spreadsheet details both the costs and non-QALY benefits at specific action level as well as the working and assumptions behind these calculations. Table 3 displays the specific actions within theme 3.

Table 3: Actions and the proportion of costs attributed to theme 3

Action		**Proportion contribution to theme**
No.	**Description**	
2	All patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers. *some exceptions apply, for example small voluntary organisations and for specific public health services	60%
5	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • identification and authentication of patients and service users, in conjunction with other public services • capability to enable service users and service professionals to locate accessible electronic records held by all the services which service users have used • ways of sharing electronic copies of service users' records with people and organisations of service users' choice who can help in understanding and managing service users' health and care.	33%
8	The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information including: • unique identifier – NHS number • terminology (including pathology and diagnostic imaging, medicines and devices, and clinical coding language) • professional record keeping – (for instance the academy of medical royal colleges records standards and social care assessment) • best practice information governance and management	40%
10	The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	33%
18	The Department of Health and NHS Commissioning Board will work to pilot new ways to incentivise the use of integrated barcode medication administration systems in care homes by September 2014, including the use of Social Impact Bonds, with the results informing future plans for implementation across England	100%

Action		Proportion contribution to theme
No.	**Description**	
20	A senior clinician or care professional responsible for taking the lead in ensuring that information is organised and utilised effectively in support of better patient care should be identified in every organisation	100%
21	Commissioners and regulators should, through regulatory and contract frameworks, assure that information system procurement decisions are underpinned by robust business cases which ensure effective VFM and benefits realisation and that are in line with published information standards	100%
22	Providers should ensure they assess the capability and meet the training needs of their clinical and care professionals in the best practice use of information as part of their routine development planning	100%
25	Providers and commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions	40%

As the responsibility for delivering this aspect of the information strategy will be delegated to central bodies and local providers, a full cost benefit analysis has not been included in this impact assessment. We have used possible delivery options to assess the costs of actions but more detailed cost and benefits analysis will be provided in subsequent impact assessments.

Table A3: The financial costs of theme 3

	Years of impact	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	10	11.05	13.45	13.98	14.65	3.25	4.09	4.62	4.71	4.10	4.18	78.08
Irrecoverable tax	0	–	–	–	–	–	–	–	–	–	–	–
Cash-releasing savings	0	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*8*	*11.05*	*13.45*	*13.98*	*14.65*	*3.25*	*4.09*	*4.62*	*4.71*	*4.10*	*4.18*	*78.08*
Local authorities												
Capital costs												
Capital	0	–	–	–	–	–	–	–	–	–	–	–
Revenue costs												
Revenue	10	0.6	0.6	0.9	1.6	1.9	2.3	2.7	2.8	1.8	1.8	17.0
Irrecoverable tax	0	–	–	–	–	–	–	–	–	–	–	–
Cash-releasing savings	0	–	–	–	–	–	–	–	–	–	–	–
Net revenue costs	*10*	*0.6*	*0.6*	*0.9*	*1.6*	*1.9*	*2.3*	*2.7*	*2.8*	*1.8*	*1.8*	*17.0*

Table B3: The opportunity costs of theme 3

		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
NHS												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		11.1	13.2	13.4	13.8	3.0	3.7	4.1	4.1	3.5	3.5	73.4
Cost savings		–	–	–	–	–	–	–	–	–	–	–
Net revenue costs		*11.1*	*13.2*	*13.4*	*13.8*	*3.0*	*3.7*	*4.1*	*4.1*	*3.5*	*3.5*	*73.4*
NPV revenue		**11.1**	**12.7**	**12.5**	**12.5**	**2.6**	**3.1**	**3.3**	**3.2**	**2.7**	**2.6**	**66.3**
Local authorities												
Capital costs												
Capital		–	–	–	–	–	–	–	–	–	–	–
Capital depreciation	4.0%		–	–	–	–	–	–	–	–	–	–
Capital charge	3.5%	–	–	–	–	–	–	–	–	–	–	–
NPV capital		**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Revenue costs												
Revenue		0.6	0.6	0.9	1.5	1.8	2.1	2.4	2.4	1.5	1.5	15.3
Cost savings		–	–	–	–	–	–	–	–	–	–	–
Net revenue costs		*0.6*	*0.6*	*0.9*	*1.5*	*1.8*	*2.1*	*2.4*	*2.4*	*1.5*	*1.5*	*15.3*
NPV revenue		**0.6**	**0.6**	**0.8**	**1.4**	**1.6**	**1.8**	**2.0**	**1.9**	**1.1**	**1.1**	**12.8**
Opportunity costs												
Opportunity costs		27.96	33.08	34.42	36.74	11.51	13.92	15.60	15.60	12.00	12.00	212.8
Value of cost savings		–	–	–	–	–	–	–	–	–	–	–

The main costs for theme 3 are associated with implementing the NHS number (costs split between themes 2 and 3) and providers meeting the training needs of healthcare professionals in better use of information.

Each year trusts invest around £650m on the replacement of acute and other secondary care information systems. Implementing the strategy may increase the costs of the rolling upgrade programme for these systems for some providers, but should normally be absorbed into business as usual needs assessments. That is, this impact assessment considers the additional costs imposed by option 2 over and above this business as usual expenditure.

Costs and non-QALY benefits of the most costly actions in option 2

Below is a summary of the costs and benefits, as well as key sources for assumptions and calculations, for the most costly actions in option 2: actions 1, 5, 11 and 25. Further details on the assumptions and calculations used here can be found in the accompanying spreadsheet to this Impact Assessment, as can the equivalent assumptions, calculations and sources for all the other actions contained in option 2.

Action 1: All NHS patients will have secure online access, where they wish it, to their personal GP records by 2015 (by the end of this Parliament). By 2015, all general practices will be expected to make available electronic booking and cancelling of appointments, *ordering of repeat prescriptions, communication with the practice and access to records to anyone registered with the practice that requires these services.*

Table a1 shows the breakdown of the costs and benefits for action 1.

Table a1: the costs and benefits for action 1

				Year	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Line no.	***Description***	***Who pays***	***Budget***	***Total***	***2012/13***	***2013/14***	***2014/15***	***2015/16***	***2016/17***	***2017/18***	***2018/19***	***2019/20***	***2020/21***	***2021/22***
Costs														
Revenue														
1	Records Access: GP Practice costs	CCGs	NHS	**62.96**	5.96	2.10	2.14	3.08	3.98	5.14	6.64	8.57	11.07	14.30
2	Staff training costs	CCGs	NHS	**4.96**	1.24	1.24	1.24	1.24	-	-	-	-	-	-
3	Security authentication costs	CCGs	NHS	**50.00**	-	-	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
4	On-line booking: GP Practice costs	CCGs	NHS	**8.52**	0.51	0.28	0.32	0.43	0.56	0.72	0.93	1.20	1.56	2.01
5	On-line repeat prescriptions: GP Practice costs	CCGs	NHS	**8.52**	0.51	0.28	0.32	0.43	0.56	0.72	0.93	1.20	1.56	2.01
Capital														
7	IT system upgrade (non-EMIS)	CCGs	NHS	**17.02**	1.21	1.77	2.33	1.67	1.67	1.67	1.67	1.67	1.67	1.67
	Total Revenue			**134.96**	**8.21**	**3.90**	**10.26**	**11.44**	**11.35**	**12.83**	**14.75**	**17.23**	**20.43**	**24.56**
	Total Capial			**17.02**	**1.21**	**1.77**	**2.33**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**
Cost savings		Cash releasing												
1	Records access: Cost savings	Y	NHS	**2,144.43**	52.47	69.96	87.45	112.94	145.86	188.38	243.29	314.21	405.80	524.09
2	On-line booking: Efficiency	Y	NHS	**74.13**	0.70	1.08	1.55	2.30	3.41	5.07	7.53	11.19	16.62	24.68
3	On-line repeat prescriptions: Efficiency	Y	NHS	**28.70**	0.70	0.94	1.17	1.51	1.95	2.52	3.26	4.21	5.43	7.02
4	Electronic communication: Efficiency	Y	NHS	**182.99**	4.48	5.97	7.46	9.64	12.45	16.07	20.76	26.81	34.63	44.72
Total														
	Total costs			**151.98**	9.42	5.67	12.59	13.11	13.02	14.51	16.42	18.90	22.10	26.24
	Total cost savings			**2,430.25**	58.35	77.94	97.63	126.39	163.67	212.05	274.84	356.41	462.47	600.50
	Net costs			**-2,278.27**	**-48.93**	**-72.27**	**-85.04**	**-113.28**	**-150.65**	**-197.54**	**-258.41**	**-337.51**	**-440.37**	**-574.26**
Economic appraisal (including opportunity costs)														
	Costs			**364.75**	22.61	13.61	30.22	31.46	31.25	34.81	39.42	45.37	53.05	62.97
	Cost savings			**5,832.60**	140.04	187.06	234.31	303.33	392.82	508.91	659.61	855.39	1,109.93	1,441.20

The main source of evidence which the assumptions and calculations are based on is a pilot study, the findings of which are due to be submitted to a peer-reviewed paper (publication date and journal yet to be decided) '*Examining the business case for Electronic Health Records Assess in two English General Practices*', Fitton C. Fitton R. Fisher B. et al. This study examines the effect of patient access to their records on-line on the number of appointments made by those patients, the number of phone calls made by practices to patients, and other savings to patients themselves.

The estimates for the costs of on-line access to GP records commitment come (predominantly) from this pilot study and take the following forms:

i. a per-patient induction [time] cost (£3.88 per-patient) – assuming 5% uptake by May 2015, reaching 30% uptake by year 10;

ii. a problem management [time] cost (£0.36 per-patient) – assuming 5% uptake by May 2015, reaching 30% uptake by year 10;

iii. security authentication costs (£50m over eight years); and

iv. IT upgrade costs and subsequent additional running costs for non-EMIS practices i.e. those practices which do not currently have access to the IT infrastructure required to meet this commitment (approximately £17m over ten years).

The estimates for the benefits of on-line access to GP records commitment come (predominantly) from this pilot study and take the following forms:

i. fewer appointments for: GPs, nurses, HCAs and others (an average of approximately one appointment per-year per-patient) – assuming 5% uptake by May 2015, reaching 30% uptake by year 9;

ii. fewer phone calls made by practices (an average of approximately two phone calls per-patient per-year) – assuming 5% uptake by May 2015, reaching 30% uptake by year 9; and

iii. fewer journeys made and time saved by patients – assuming 5% uptake by may 2015, reaching 30% uptake by year 9.

The total benefits, assuming 5% uptake by May 2015, reaching 30% uptake by year 9, were halved to take into account the following weaknesses of the pilot study:

i. the sample size was extremely small (two GP Practices);

ii. possible biases from:
    - the GP Practices in question being pioneers in access to GP records on-line, possibly making the benefits realisation unrepresentative;
    - the possibility of the patients in the pilot practices being unrepresentative, making the benefits realisation unrepresentative.

The estimated costs for the on-line appointment booking and repeat prescription services are based on the [problem management costs for the] on-line access to GP records commitment. We assume that the same level of problem management costs will be incurred for each of these commitments in addition to those incurred for the on-line access to GP records commitment.

The estimated benefits for the on-line appointment booking and repeat prescription services are calculated using a series of assumptions based on information contained in the following sources – the estimated benefits are based on estimates (from the below sources) on time saved from those patients who are able to use on-line services such as these freeing up time for more effective use elsewhere.

- Salisbury C, Goodall S, Montgomery AA, Pickin DM, Edwards S, Sampson F, Simons L, Lattimer V. Does Advanced Access improve access to primary health care? Questionnaire survey of patients. British Journal of General Practice.2007 57(541):615-21;
- Salisbury C, Montgomery AA, Simons L, Sampson F, Edwards S, Baxter H, Goodall S, Smith H, Lattimer V, Pickin DM. Impact of Advanced Access on

access, workload, and continuity: controlled before-and-after and simulated-patient study. British Journal of General Practice.2007 41):608-14;

- Goodall S, Montgomery J, Banks J, Sampson F, Pickin M, Salisbury C on behalf of the Advanced Access Evaluation Team. Implementation of Advanced Access in general practice: postal survey of practices. British Journal of General Practice 2006 ; 56:918-923;
- Dixon S, Sampson, F C. O'Cathain, Alicia. Pickin, Mark. Advanced access: more than just GP waiting times?. Family Practice. 2006; 23(2): 233-239;
- Pickin D M, O'Cathain A, Sampson F, and Dixon S. Evaluation of Advanced Access in the National Primary Care Collaborative. British Journal of General Practice 2004; 54: 334-340;
- Salisbury C, Banks J, Goodall S, Baxter H, Montgomery A, Pope C, Gerard K, Simons L, Lattimer V, Sampson F, Pickin M, Edwards S, Smith H, Boudioni M. An Evaluation of Advanced Access in General Practice. Final Report to NHS Service Delivery and Organisation Research and Development Programme. February 2007;
- Pickin M, O´Cathain A, Sampson F, Dixon S, Nicholl J. Evaluation of the National Primary Care Collaborative Advanced Access Programme. Final report to the Department of Health. December 2002.

For further details on the sources, assumptions and calculations, please see the accompanying spreadsheet to this Impact Assessment.

Action 5: The Department if Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: (i) Identification and authentication of patients and service users, in conjunction with other public services; (ii) Capability to enable service users and service professionals to locate accessible electronic records held by all the services which service users have used; (iii) Ways of sharing electronic copies of their records with people and organisations of their choice who can help in understanding and managing their health and care.

These three actions can be most efficiently securely delivered by building on the inter-connectivity which is inherent in the NHS spine architecture and offering a central solution using the Government Gateway approach.

Providing identity assurance of service using a cross-government approach will reduce costs and make it more likely for users to access on-line services if there is one login mechanism to access multiple government services[21].

A large proportion of citizens would prefer to conduct transactions online, but awareness of online services is low. In order to increase the take up of government on-line services there is a need to increase awareness of single sign-on and the range of government services available online.

A single sign-on means that a citizen would sign on to Government hosted web site and then could access several different services at the same time, it is far more likely that with a single sign-on they will access different services at different times.

Single sign means the security level can be much more tightly controlled. Four levels of security can be defined as follows:

Security levels

Level	Details	Outcome
0	No password	Could be anyone
1	Password only	Self asserted
2	2 factors eg password + smartcard	Balance of probabilities
3	Biometrics	Beyond all reasonable doubt

NHS staff currently use a level 2 security log-on to access medical records. Patient access to GP records are available using level 1 security.

Recommended security levels for online interaction with Government

Transaction	Level
Requesting information only	0
Submitting a form (eg claim for benefit)	1
Paying money (eg tax)	1
Receiving money (eg benefit)	2
Sensitive personal data	2/3

Over time it would be highly desirable for all user access to records to migrate to a cross-Government single sign on at least using a level 2 security level.

DWP are currently the lead department on identity assurance services initially providing for 21 million people on benefits. The tender for a 4 year contract to provide this service was

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[21] http://digital.cabinetoffice.gov.uk/2012/03/01/identity-a-small-step/

offered at £200m including on-line and telephone services[22]. DHID have estimated that on-line level 2 security system would cost £50m over 8 years sharing cross government procurement (central estimate, range +/–100%)

The ability to locate any electronic record held by a provider by patient NHS number is a completely new service. It is similar in concept to the Open Exeter system which matches patients to GP services[23] and the NHS Demographics service[24] which permits providers to locate a patients NHS number and address information. Based on these two services it has been estimated that the establishment and the running of a NHS Directory of Records service would cost £20m/year. This cost would not include retrospective identification of old and non-active records. This service could also include the recording of patient sharing preferences in accordance with information governance review (action 10).

Table a5 shows the breakdown of the costs and benefits for action 5.

Table a5: the costs and benefits for action 5

Line no.	Description	Who pays	Budget	*Year*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
				Total	***2012/13***	***2013/14***	***2014/15***	***2015/16***	***2016/17***	***2017/18***	***2018/19***	***2019/20***	***2020/21***	***2021/22***
Costs														
Revenue														
1	Publish a health and care standards route map		NHS	**1.00**	-	1.00	-	-	-	-	-	-	-	-
2	Develop the standards identified in the route map		NHS	**1.00**	-	-	0.50	0.50	-	-	-	-	-	-
3	Establish a data dictionary to underpin delivery of standards	NHS CB / IC	NHS	**1.00**	-	-	0.50	0.50	-	-	-	-	-	-
4	Creation and administration of a national system of registration of patient records and facilitate a Directory of Patient Records (DoPR)	CfH	Centre	**130.00**	-	-	5.00	10.00	15.00	20.00	20.00	20.00	20.00	20.00
5	Identification and authentication of patients and service users, in conjunction with other public services. To Note - The appropriate delivery mechanism for this action is not yet established. Estimates of delivering centrally included as a proxy - expected to be at the high end of the potential cost	CfH	Centre	**50.00**	-	-	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
	Total Revenue			**183.00**	**-**	**1.00**	**12.25**	**17.25**	**21.25**	**26.25**	**26.25**	**26.25**	**26.25**	**26.25**
	Total Capial			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total														
	Total costs			**183.00**	**-**	**1.00**	**12.25**	**17.25**	**21.25**	**26.25**	**26.25**	**26.25**	**26.25**	**26.25**
	Total cost savings			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Net costs			**183.00**	**-**	**1.00**	**12.25**	**17.25**	**21.25**	**26.25**	**26.25**	**26.25**	**26.25**	**26.25**
Economic appraisal (including opportunity costs)														
	Costs			**439.20**	-	2.40	29.40	41.40	51.00	63.00	63.00	63.00	63.00	63.00
	Cost savings			**-**	-	-	-	-	-	-	-	-	-	-

The estimated costs for delivering this action come from the *DHID Evidence Base*, and take the form of the cost lines outlined above in table a5. For further details on the sources, assumptions and calculations, please see the accompanying spreadsheet to this Impact Assessment.

Action 11: The Department of Health will sponsor the provision of a comprehensive online 'portal' – to bring together the best of the relevant information on health, public health and care support.

Table a11 shows the breakdown of the costs and benefits for action 11.

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[22] http://www.computerweekly.com/news/2240112515/DWP-seeks-200m-IDA-framework

[23] http://www.connectingforhealth.nhs.uk/systemsandservices/ssd/prodserv/vaprodopenexe

[24] http://www.connectingforhealth.nhs.uk/systemsandservices/demographics

Table a11: the costs and benefits for action 11

				Year	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Line no.	***Description***	***Who pays***	***Budget***	***Total***	***2012/13***	***2013/14***	***2014/15***	***2015/16***	***2016/17***	***2017/18***	***2018/19***	***2019/20***	***2020/21***	***2021/22***
Costs														
Revenue														
1	Set up the national portal	Centre	Centre	**0.50**	-	0.50	-	-	-	-	-	-	-	-
	Total Revenue			**0.50**	**-**	**0.50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Total Capial			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Cost savings		Cash releasing												
1	National website hosting cost savings	Y	Centre	**8.00**	-	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	Local website closure savings	Y	NHS	**30.10**	-	-	-	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Total														
	Total costs			**0.50**	-	0.50	-	-	-	-	-	-	-	-
	Total cost savings			**38.10**	-	-	1.00	5.30	5.30	5.30	5.30	5.30	5.30	5.30
	Net costs			**- 37.60**	**-**	**0.50**	**- 1.00**	**- 5.30**	**- 5.30**	**- 5.30**	**- 5.30**	**- 5.30**	**- 5.30**	**- 5.30**
Economic appraisal (including opportunity costs)														
	Costs			**1.20**	-	1.20	-	-	-	-	-	-	-	-
	Cost savings			**91.44**	-	-	2.40	12.72	12.72	12.72	12.72	12.72	12.72	12.72

For the cost of setting up the national portal, we have two sources of estimates: first, research from the *NHS Digital Communications Review* found that 'start-up costs which can be significant and may range from £20,000 – £100,000 per site'; and second, the start-up costs for *NHS Choices* was estimated as £500,000. Therefore, we use the start-up cost of NHS Choices as the estimate for the cost of starting up the portal, as it was deemed the most representative proxy.

For the costs of running the portal we assume that the running costs will be the same as the running costs for *NHS Choices* under the do nothing option. This running cost was £13m in 2012/13. We therefore assume no additional cost or cost saving from the transfer of *NHS Choices*' content to the new national portal.

The following cost savings from the national portal are assumed:

- a cost saving from a reduction in web hosting costs from other national websites from moving their content onto the single portal, estimated as £1m per annum;
- a reduction in local health information website spend from reducing the duplication identified in the *NHS Digital Communications Review*, estimated as a 5% reduction in the £86m estimated current local spend, from year three (2015/16).

For further details on the sources, assumptions and calculations, please see the accompanying spreadsheet to this Impact Assessment.

Action 25: Providers and Commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions.

Table a25 shows the breakdown of the costs and benefits for action 25.

Table a25: the costs and benefits for action 25

				Year	0	1	2	3	4	5	6	7	8	9
Line no.	***Description***	***Who pays***	***Budget***	***Total***	***2012/13***	***2013/14***	***2014/15***	***2015/16***	***2016/17***	***2017/18***	***2018/19***	***2019/20***	***2020/21***	***2021/22***
Costs														
Revenue														
1	Establish clinical portals at a care community level, giving end to end access to clinical records where appropriate consent is given.		NHS	**120.00**	-	-	-	-	20.00	20.00	20.00	20.00	20.00	20.00
	Total Revenue			**120.00**	**-**	**-**	**-**	**-**	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**
	Total Capial			**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total														
	Total costs			**120.00**	-	-	-	-	20.00	20.00	20.00	20.00	20.00	20.00
	Total cost savings			**-**	-	-	-	-	-	-	-	-	-	-
	Net costs			**120.00**	-	-	-	-	20.00	20.00	20.00	20.00	20.00	20.00
Economic appraisal (including opportunity costs)														
	Costs			**288.00**	-	-	-	-	48.00	48.00	48.00	48.00	48.00	48.00
	Cost savings			**-**	-	-	-	-	-	-	-	-	-	-

The estimated costs for delivering this action come from the *DHID Evidence Base*, and take the form of the cost line outlined above in table a25. For further details on the sources, assumptions and calculations, please see the accompanying spreadsheet to this Impact Assessment.

QALY benefits

Many assessments of investments in IT in health focus only on the benefits in terms of the efficiency gains or return on investment and this analysis will also discuss the benefits that such investment can bring. However we will illustrate how the actions in different themes can also lead to a positive impact on health outcomes in terms of QALYs. The QALY benefits can be identified from two main sources:

i. an estimated health benefit which illustrates how better information access and flows can translate into better health and social care outcomes; and

ii. resources released by the better use of information can be used to purchase health benefits, assuming high levels of allocative efficiency.

We present some examples of QALY benefits in the themes here, as an illustration of the type of health benefits that might accrue. These are only estimates and based on limited evidence. Without strong evidence that better information flows have led to measurable health impacts, these examples should best be treated as largely illustrative of what might ensue.

In total, we estimate approximately £1bn–£1.2bn of QALY benefits for *The power of information* (see table Q1 below for the central estimate):

Table Q1: The QALY benefits (£m) of option 2

	Yr. 0	**Yr. 1**	**Yr. 2**	**Yr. 3**	**Yr. 4**	**Yr. 5**	**Yr. 6**	**Yr. 7**	**Yr. 8**	**Yr. 9**	**Total (£m)**
Action 1 (£m)	3.2	6.3	10.5	17.0	26.4	39.7	58.6	85.2	122.2	157.8	526.9
Action 11 (£m)	33.8	34.4	35.1	35.8	36.5	37.3	38.0	38.8	39.5	40.3	369.6
Earlier cancer diagnosis (£m)	6.0	5.9	5.8	5.7	5.7	5.6	5.5	5.4	5.3	5.2	56.2
Reduced medical errors (£m)	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.0	10.0	11.7	29.7
Total (£m)	42.9	46.7	51.5	58.6	68.5	82.5	104.1	135.4	177.1	215.1	982.3

QALY benefits of theme 1

Illustration of QALY benefits

Action 10: The centre will sponsor the provision of a comprehensive online portal, to bring together the best of the relevant information on health, public health and social care

Evidence from the document on re-evaluating the benefits of NHS Choices shows that with improved access to information the public will be better empowered to manage self limiting conditions at home, without contacting their doctor. Furthermore increased positive health outcomes, and an improved ability to manage patients and their LTCs in the community the number of primary care emergency attendances will decrease. The efficiency with which a GP can conduct a consultation, supported by enhanced access to centralised and comprehensive information means that they will be able to conduct more consultations within the available time.

There is good, independent evidence that NHS Choices is delivering this benefit. A study by the Department of Primary Care and Public Health at Imperial College, London, and funded by the Department of Health, was carried out in 2010 and published in the *Journal of the Royal Society of Medicine*[25] in 2011. This comprised a survey of patients in six general practices in London and an online survey of NHS Choices users. The key finding was that 33% of online users and 18% of the general practice patients reported reduced GP consultations as a result of using NHS Choices.

These findings have been validated and reinforced by an online survey carried out on NHS Choices in March 2011, which achieved 1851 respondents. Nearly two thirds of these said that they used NHS Choices in conjunction with a GP visit – before, during or after. Visiting NHS Choices led to 27% of respondents claiming to have made fewer trips to their GP – increasing to 36% for those who use the site solely before an intended appointment. Considering the number of users of *NHS Choices* (15m), it is possible that this represents an underestimate.

Here we consider that lack of information can lead to anxiety and sometimes depression among patients. The Sainsbury Centre for Mental Health[26] estimated that for those with anxiety and moderate depression, the loss of health is estimated to be 0.098 of a health related quality of life score. Since this figure is also based on co-morbidity, we assume a more conservative figure of an increase of 0.05 percentage points per health related quality of life score would be reasonable for patients without co morbidities.

In this theme we make the assumption that information from an online portal that brings together all relevant information and which can provide links to further assured information

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[25] http://shortreports.rsmjournals.com/content/2/7/56.full

[26] The economic and social costs of mental illness, The Sainsbury Centre for Mental Health, June 2003.

sources about a patient's specific condition is valued and trusted more than general sources of information found on the internet.

It has previously been estimated that the difference between a patient who is anxious or mildly depressed and one who isn't, is equal to 5% of their QALY score.[27]

Assuming around 15m users of the *NHS Choices* site (source: NHS Choices Extension Business Case November 2011), and assuming that one in thousand of these users could benefit to the extent of a 5% QALY improvement in their anxiety levels, we estimate the present value of benefits over a ten year period to be £345m, if the change is not temporary and leads to longer term benefits.

Action 1: All NHS patients will have on-line access, where they wish it, to their personal GP records, and be able to share these, by May 2015

We hypothesise that better access to a patient's own GP records will then relieve some of the anxiety that patients face if they do not sufficiently and adequately understand the information they are given at their GP Practices. This assumes that patients seeking information in general are anxious about their condition and may be sufficiently worried as to affect their daily life, as measured, for example, on an EQ5D instrument. For example, if a personal is unable to work because of a worry about a medical condition, this may have a long term effect. It is the role of healthcare professionals to reduce anxiety and worry when interacting with patients.

The Department had estimated that around 17.5m adults may be living with long term conditions.[28] In the UK, about 80% of GP consultations, 60% of days spent in hospital and two thirds of emergency admissions are related to long term conditions. Having a long-term condition can affect all aspects of physical and mental wellbeing and people with co-morbidities are significantly more affected. Such people require a suitable care plan, where self management is part of the plan. Self-management support can be viewed in two ways: as a portfolio of techniques and tools that help patients choose healthy behaviors; and a fundamental transformation of the patient–caregiver relationship into a collaborative partnership. Experience from the US on patients having access to doctor's notes shows that patients expressed considerable enthusiasm and few fears, anticipating both improved understanding and more involvement in care (*Inviting patients to read their doctors' notes: patients and doctors look ahead: patient and physician*[29]). There is some evidence that people who have access to their personal records will self-care better, for example people are more likely to stop smoking or take care of medication (The Health Foundation: *Helping People Help Themselves*, May 2011).

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[27] http://www.york.ac.uk/media/che/documents/papers/discussionpapers/CHE%20Discussion%20Paper%20138.pdf

[28] Department of Health (2004). *Improving chronic disease management*. London: Department of Health.

[29] Beth Israel Deaconess Medical Center, Harvard Medical School, December 2011.

Assuming that such self-management support includes access to GP records, and taking a very conservative figure of one in 200 patients (85,000 out of an affected population of 17m) to have benefits from access to their own health records, we estimate that a health related quality of life score increase of 0.05 percentage points would yield a value benefit of around £474m (using a value of £60,000 per QALY), again assuming the benefit is persistent for over 10 years. Since the information in the health record is more personalised and relevant to the patient, requiring less interpretation of general information to the particular case or stage of a condition, we assume a higher proportion to patients to benefit compared to those only accessing an online portal. However due to mixed evidence regarding the benefits, we have assumed only very conservative figures for our quantified examples.

QALY benefits of theme 2

Action 21: The Government will focus the information challenge fund on sharing information across boundaries

This will also be in parallel with the action for providers and commissioners of NHS funded care to implement patient and professional access to view records across specialities and settings through professional portals

Better information sharing by professionals not only helps in the patient receiving a quicker and more appropriate pathway of care, it also helps reduce the time spent by the professionals on each patient, as records need not need to be duplicated or reassessed, and reduces the number of medical errors caused by inadequate information.

Cancer is one of the few clinical conditions where there is good evidence of the relationship between delay of diagnosis and prognosis. Improving Outcomes: A Strategy for Cancer[30] (DH, January 2011) identified that up to 10,000 deaths in England could be avoided each year if patients were diagnosed as the same earlier stage as in other European countries. There is evidence from the National Reporting and Learning System at the National Patient Safety Agency (NPSA) of communication delays associated with cancer diagnoses. Delays in correspondence are one of a number of factors resulting in delayed diagnosis. Based on the assumption that correspondence delays might account for at least 1% of all delays in diagnosis, we assume that around 5,033 QALYs could be saved over the appraisal period.

In terms of reducing medical errors, the National Patient Safety Agency reports that in 2010-11 there were several incidents within the healthcare system which caused severe harm and even death to patients. There are four types of incident which could result from inadequate information: treatment, documentation, clinical assessment and consent/confidentiality. We assume that 10% of the occurrence of these incidents could be attributed to poor information, except for documentation, where we assume that poor information contributes

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[30] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_123371

80% to poor documentation. We also assume that the QALY gained from avoiding these incidents arising due to poor information is 0.05 for a severely harmed patient and 0.1 for a death and that such patients will live for a further 15 years. We also assume that the benefits will be available incrementally as organisations take time to adopt new information systems. On as assumption of a cumulative take-up of 16%, 50%, 84% and 100% in years 7-10, we estimate a total QALY benefit worth £30m. Using a value of £60,000 per QALY leads to a QALY benefit of around £302m in PV terms over a period of 10 years.

All the actions under theme 2 that can provide health benefits will also provide health benefits under Theme 3. Better information sharing among professionals will help in ensuring that professionals involved in the pathway of care for each service user being able to track their clinical records without undue delay.

Since the health benefit is holistic across all these actions, it is neither reasonable nor practical to attempt to isolate and identify the benefits from any one of these actions. We therefore consider that the benefits that can be realised under theme 2 will also be realised under theme 3.

Non-quantified benefits

Table D5 list the set of benefits, by theme and action, where we have not quantified their benefits.

Table D5: Summary of non-quantifiable benefits

Theme 1	Anticipated impact	Qualitative benefits
Actions 1 and 4 All NHS patients will have on-line access with appropriate record access control mechanisms using Information Governance and with support for access and engagement promoted by the Royal Colleges and other professional organisations	Patients (and those they wish to give access to) close gaps in knowledge of their individual medical history and current state, improve personal discussions with clinicians, increase trust and confidence in decisions made	Confidence that confidentiality is maintained to the people and levels they feel appropriate Convenience without need for face to face professional 're-assurance' Reduced anxiety and stress associated with diagnosis and treatment Greater engagement with condition and pathway chosen

Theme 1	Anticipated impact	Qualitative benefits
Actions 11, 17 and 14 The centre will sponsor the provision of a comprehensive online 'portal' – to bring together the best of the relevant information on health, public health and social care covering simpler metrics, which practices offer online access to records and other 'open' data, and receive support to assist making best use of this information	Patients and citizens have a single source of reference data from varying perspectives. This will include national standards, professional guidelines, clinical research and patient experiences from accredited sources Content will include information about medical conditions, procedures including information for self care, and their choice of provider options (including each features and outcome performance) for them to tailor maximum personal benefit	Convenient and simple access to information that can be trusted at time of need. Inequalities in accessing information narrow Quicker understanding and reduced anxiety and stress in learning how to self care, access care or manage conditions once diagnosed Encouragement for patients to be more active in their care, leading to more personalised pathways with better satisfaction, reduced hospital usage and better outcomes Disadvantaged groups are helped to overcome inequality in health outcomes Evidence suggests that delivering better ways of presenting information about the performance of health and social care organisations could help service users make more informed choices and better hold their local services to account [Peter E. et al (2007a) 'Less is more in presenting quality information to consumers' – Medical Care Research and Review and Hibbard JH and Peters EM (2003) 'Supporting informed consumer health care decisions: data presentation approaches that facilitate the use of information in choice' – Annual Review of Public Health]. Specifically, simpler metrics of organised performance that aggregate existing information would make it easier for people to digest the large amount of information already available Disclosing performance results increases the accountability of healthcare providers as managers will be concerned about maintaining their public image and increasing market share. It also motivates quality improvement activities, especially by targeting underperforming areas identified by the performance results

Theme 1	Anticipated impact	Qualitative benefits
Action 27 Improved Patient feedback	Providers will be able to quickly gauge the standard of service they provide across many settings and patient and user groups	Providers will be able to react quickly and deploy resources efficiently in response to user feedback

Theme 2	Anticipated impact	Qualitative benefits
Action 2 All patient data (in NHS funded care) should be identified by the NHS number as the primary identifier at the point of care by 2015 and	Patients know their NHS Number, and can provide it to any care provider for immediate confirmation of identity	Patient convenience and confidence – no longer reliant on their memory to repeat medical details in times of need Trust that every clinical contact is correct and their record is complete should patients wish to seek help and advice on their care
Actions 5, 14, 15, 21 and 25 Standards set for national and local interlinking of systems and effective transfer of direct care information including: i. Terminology (including pathology and diagnostic imaging, medicines and devices, and clinical coding language) eventually enabling extraction of management data directly from clinical data ii. Identification and authentication of [staff and] patients and service users, in conjunction with other public services, including encryption tools to facilitate secure communication iii. Searchable electronic records locator services iv. Ways of sharing electronic copies of their records with people and organisations who can help in understanding and managing their health and care such as patient and professional access to view records across specialities and settings through simple patient and professional portals	Consecutive history can be constructed across many providers using record locators or portals Minimised delay in treatment pathways and reduction of manual processes Richer linked longitudinal data sets available for secondary uses	Improved clinical confidence that rich medical history is available if necessary to inform decisions Safer care for patients with co-morbidities particularly in respect of medication Improved clinician effectiveness, provider efficiency and patient experience. Opportunity for commissioners to encourage new working practices New or faster delivery of performance or research benefits to providers and patients

Theme 3	Anticipated impact	Qualitative Benefits
Actions 25 Providers and commissioners should make routine procurement decisions in line with published information standards and strengthen the status of informatics professionals across health and social care including meeting the training needs of their healthcare professionals in the better use of information Providers and commissioners should National stakeholders working with the centre on a programme of work setting standards for national effective transfer of direct care information including: i. Professional record keeping – (for instance the academy of medical royal colleges records standards and social care assessment	Healthcare professionals are led, equipped and confident to better record and use information with their patients The quality of clinical information improves both for benefitting individual patients and for secondary uses	Patients' expectations of more and richer health information (generated by experience of the internet age) are met Patients experience greater satisfaction with individual clinician contacts and when transferring between healthcare professionals or providers The value of information collected increases justifying the cost of its collection along a chain of plural providers. All providers of information appreciate their role in ensuring that use of information is optimised for the benefits of the whole system of health and care as well as to individual patients, clinicians and organisations

Risks

High-level risk for option 2

The following two high-level risks have been identified for option 2:

i. individuals' care records may be more easily accessed by unauthorised individuals; and

ii. the information system across the health and social care landscape as a whole may be more susceptible to malicious attack.

Having identified this risk, the Department of Health conducted an internal risk assessment, focusing on these high level risks, which concluded that:[31]

The UK Government takes the risk to data and systems in an increasingly complex and interconnected world seriously and has rated cyber attacks as a Tier 1 threat.[32]

The UK Government is rationalising the number of technology platforms used to deliver Government services to increase the protection and improve protective monitoring. The Government Gateway approach permits user registration and identity checking, secure data sharing and transfer of sensitive information (including payments) and mail services.[33]

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[31] Joint statement from the Head of NHS Infrastructure Security and NHS Information Security & Risk Policy Manager.

[32] http://www.cabinetoffice.gov.uk/resource-library/cyber-security-strategy

[33] http://www.nao.org.uk/publications/1012/digital_britain_one.aspx

At a national level the Cyber Security Strategy outlines actions which can mitigate this ever evolving risks. The actions which are particularly relevant in this strategy are:

- work with the companies that own and manage our critical infrastructure to ensure key data and systems continue to be safe and resilient;
- establish a new operational partnership with the private sector to share information on threats in cyberspace;
- encourage industry-led standards and guidance that are readily used and understood, and that help companies who are good at security make that a selling point; and
- help consumers and small firms navigate the market by encouraging the development of clear indicators of good cyber security products.

Across the NHS systems are already linked over a secure network, N3; increasingly non-NHS organisations providing NHS funded care and local authority funded social care are being connected, once their systems have been assessed as having adequate security standards in line with existing policy. The cyber threats to N3 and its hosted assets are assessed in the National Risk Assessment (NRA) as broadly the same as any other private network including Government, police, local authority etc.

The NHS and its partners have made significant investment in existing security infrastructure and information governance activities which are well established and provide a foundation upon which the Information Strategy can be successfully implemented. Local care providers shall continue to be responsible, in line with legislation and best practice, for information risks and business continuity at a local level which includes business threats due to Information or IT failures.

There will be a change in risk due to the increased number of organisations connecting to each other, and the increase in the number of services which will be available to patients online and providers to share information electronically. This will be the increased risk of many organisations being affected by security issues at the same time and potentially affecting the availability of critical care services across some or all of the country. However, each affected organisation and local care community have local risk management and mitigation policies and procedures in place in line with Government and relevant EU standards, and should there be a widespread problem, national emergency and business continuity plans would be actioned. If the problem was affecting a particular system, the supplier would also be proactive in resolving the problem, to protect their reputation in the market and under contract clauses that are standard in any Government IT procurement.

Centrally provided services (such as the Spine) shall continue to provide high levels of security and assurance which benefit NHS organisations and others approved to use them. These existing security capabilities are developed, maintained and refined as part of ongoing business as usual, in line with the current Government Cyber Security Strategy, Government and EU legislation and standards. Currently, existing central security capabilities are being developed to include an Information Governance Baseline which will enable local organisations to improve their capability to identify, choose and implement security compliant products and services that enable flexibility whilst delivering effective security at the local level.

In addition, the existing central operational security functions which are currently tasked with managing central infrastructure for the NHS will transition into the new Health and Social Care system and will be developed in line with business requirements of the system subject to appropriate business cases being made and approved. This function provides an intelligence capability to facilitate better management of risks which affect many organisations or require co-ordination of activities across Government sectors.

Overall the cyber security risk assessment of more connected health and social care information systems, with these safeguards, are no greater that those for other Government sponsored systems.

*Joint statement from the Head of NHS Infrastructure Security and NHS Information Security & Risk Policy Manager:

The Department of Health will publish a cyber security strategy in due course. This strategy will provide guidance to the NHS on mitigating risks to security, including from policies advocated in the information strategy, and will build on the current cross-Government cyber security strategy. Implementation of *The power of information* will be coordinated with this strategy. Also, the standards route map will include the introduction of further security standards as necessary.

The estimated costs of mitigating this high-level risk for option 2 are built into the estimated costs by action in this impact assessment.

General risk types

As outlined in Table D1: The ladder of interventions available to achieve policy objectives in IM&T, there are a range of intervention types available to policy makers. The types of risk associated with each level of intervention are outlined in table R1 below:

Table R1: Risk types mapped to the ladder of interventions

Intervention level	General risk categories
Centrally managed and funded	• New centrally managed and funded proposals will be prejudiced by the fall-out from NPfIT collapse • Informatics management effort will be prioritised on re-homing current national applications and services, rather than on new implementations • Approvals processes for investment are likely to be more exacting along with greater demonstrable capability to deliver • There is no central funding • There is a 'management' hiatus until the full changes of the Act have worked through, so making difficult the roll-out of national implementations • Unless national projects deliver short term cash savings for NHS organisations, they do not 'engage'
Framework approach	• There is 'no room' in the operating framework (or its successor) for informatics, which become relegated to second level priorities • Performance management of the NHS is solely concerned with organisations' financial control so disregards cross-organisation benefits • Changes to tariffs do not deliver changes from already financially poorly performing organisations
Tightly regulated standards	• Professional bodies unwilling to apply sanctions for 'records access' violations • 'Mass protest' by professional groups renders sanction unworkable
Loosely regulated standards	• Commissioners have 'bigger fish to fry' in contract management, so do not apply sanctions
Direction setting, evidence base and support	• NHS organisations ignore policy advice because of other priorities competing for management attention • NHS bodies choose not to take advantage of work done by third sector

Specific risks for option 2

Table R2 shows the risk register for each theme of option 2. A full risk register for the full list of actions within option 2 is given in Annex C.

Table R2: Risk register for option 2 at theme level

Theme	Risks	Likelihood [1-5]	Impact [1-5]	RAG [Likelihood*Impact]
1	See Annex C	1.8	2.4	4.32
2	See Annex C	2.9	3.3	9.57
3	See Annex C	2.33	4	9.32

Note: Likelihood, Impact and RAG rating for theme level risks are an average of the corresponding scores from the risks assigned to the specific actions in Annex C.

A summary of the high risk actions (defined as a RAG rating of 15 or more in the full risk register) and moderate risk actions (defined as a RAG rating of 8-14 in the full risk register), by theme, is given below:

High risk commitments – theme 2

Action 25: Providers and Commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions:

i. the specific risk is that developments to facilitate professional and patient access to records do not happen quickly enough to have any measurable impact on outcomes or efficiency. Many NHS organisations are developing or procuring portals, but what is impossible to assess is the overall national scope and timetable for delivery; and

ii. as delivery is to be managed locally, there is a risk that local solutions do not interoperate for the benefit of patients across boundaries.

Moderate risk commitments – theme 1

Action 1: All NHS Patients will have secure online access, where they wish it, to their personal GP records by 2015 (by the end of this Parliament) By 2015, all general practices will be expected to make available electronic booking and cancelling of appointments, ordering of repeat prescriptions, communication with the practice and access to records to anyone registered with the practice that requests these services:

i. the risk relates to the rate of roll out from the small number of pilot sites offering the facility at present. There may be capacity problems with suppliers if demand from GPs is high, conversely there may be resistance from GPs ('rushing to the back of the queue').

Action 14: the Health and Social Care Information Centre publishing all nationally held clinical data by April 2014, where possible by clinical team:

i. the risk identified is that of the service not being fully populated with data from all possible feeder systems because of implementation difficulties – technical or local prioritisation.

Moderate risk commitments – theme 2

Action 2: All Patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers.

*some exceptions apply, for example small voluntary organisations and for specific public health services:

i. the risk is in the word 'all', and the extent to which there are specific organisations which are unable to complete the work, or specific care settings, or processes which prove difficult to address.

Action 5 and Action 10: The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include:

- identification and authentication of patients and service users, in conjunction with other public services;
- capability to enable us and our professionals to locate accessible electronic records held by all the services we have used; and
- ways of sharing electronic copies of their records with people and organisations of their choice who can help in understanding and managing their health and care.

The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott:

i. there is a risk that the standards to inter-linking will be late or incomplete. This would cause delays for local organisations to procure upgrades to their systems, or new systems.

Action 9: All Providers of NHS funded care (including Social enterprises and AQPs), as part of their commissioning contracts with the NHS, will be given access to a limited number of NHSmail accounts to facilitate secure email communication where this is cost effective:

i. there may be contract negotiations with existing technology suppliers both local and central which delay the roll-out and some small organisations may find the requirements for secure communication too onerous for the volume of NHS funded business they have.

Action 15: The NHS Commissioning Board will lead and coordinate work on developing commissioning data sets (the main data collection from secondary care) to allow data returns in SNOMED CT from April 2014:

i. changes to definitions and data flows in commissioning datasets are notoriously time-consuming to implement. There is a particular risk during the transition to NHS Commissioning Board to making any changes to national CMDS.

Action 7: The NHS Commissioning Board will consider publishing commissioning guidance for support to assist patients to make the best use of the information provided:

i. the general public has a wide range of abilities to make use of clinical and information. Ensuring the strategy does not widen the digital divide will require support for those who most need it. Funding the support needed may not possible given other local priorities.

Moderate risk commitments – theme 3

Action 21: Commissioners and Regulators should, through regulatory and contract frameworks, assure that information system procurement decisions are underpinned by robust business cases which ensure effective VFM and benefits realisation and that are in line with published information standards:

i. the risk is that local procurement decisions consider only local short-term business needs and select the cheapest and quickest solutions. These may not conform to national standards, but may meet the local requirements.

Action 23: Providers should ensure they assess the capability and meet the training needs of their clinical and care professionals in the best practice use of information as part of their routine development planning:

i. financial pressures on local organisations mean they do not fully fund training needs of their staff.

E: Impacts, Costs and Benefits of Option 2

Sensitivity analysis

As outlined in the risks section above, and the full risk register in Annex C, there are a range of risks to the estimated costs and benefits of option 2. The risks of the strategy have not been quantified due to the inherent uncertainty in delegating many deliverables to bodies with are not yet fully operational. The following sensitivity analysis assesses the extent to which costs can rise or benefits fall for option 2 to no longer be cost-effective.

To be cost-effective, the benefits of option 2 must be at least 2.4 times the magnitude of costs. The best estimate of costs and benefits of option 2 meet the cost-effectiveness threshold. This sensitivity analysis excludes the non-quantified benefits. As outlined in Tables S1 and S2 below, the costs would have to increase by 107%, or the benefits decrease by 52%, for option 2 to no longer be cost effective (not withstanding the unquantified benefits).

Table S1: Scope for increase in costs

Scope for increase in costs	
To meet the 2.4 threshold, costs must be less than	2,639
Current estimate of costs	1,275
Difference between costs and threshold	**1,364**

Table S2: Scope for reduction in benefits

Scope for reduction in Cost savings	
To meet the 2.4 threshold, Cost savings have to be at least	3,061
Current value of Cost savings	6,334
Difference between Cost savings and threshold	**3,273**

Expected Impact upon Equalities and Human Rights

The equality analysis contained within the full *Equalities Impact Assessment* examines the potential effect that *The power of information* will have. A major issue that that has been identified is the link between literacy and health outcomes. Studies have highlighted that many people's level of literacy and therefore, their ability to access and understand health information and services is limited. This affects many different groups in this country and means that they do not achieve their best possible health and care outcomes.[34] Low literacy levels is a bigger problem than can be solved by the health and care system, but improving the health and care information available to us all, and the ways in which it can be accessed, could help to improve health and care outcomes for everyone.

By far, the area of most concern that came to the fore when consulting on the Information strategy was around digital exclusion. We know that:

i. 9.2m adults have never accessed the internet;

ii. those aged 65+ are much more likely to be offline than younger people;

iii. 60% of adults aged 65+ have never accessed the internet;

iv. adults in lower socio-economic groups are also less likely to access the internet;

v. only 15% of people living in deprived areas used online Government services in 2009;

vi. 40% of UK population do not use online channels, including websites such as *Directgov* and *NHS Choices*;

vii. some are digitally excluded by choice; and

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[34] Association between low functional health literacy and mortality in older adults: longitudinal cohort study, http://www.bmj.com/content/344/bmj.e1602

viii. of those who do not have the internet at home 55% say they have no interest/see no use for it, only 12% cite financial reasons:
    - some are aware that services exist online but choose to access them by other means.

We recognise that different people will want and need to access information in different ways and that it is therefore essential to remember that information must never only be web based. In health and care, the approach is about making more information available in a way that is 'digital first' rather than 'digital by default'.

Other key effects on equalities that the analysis contained in the *Equalities Impact Assessment* for *The power of information* identified include:

i. the fact that some people will not be able to access information online due to reasons beyond not having access to the internet. People who do not speak or read English and/or those who have learning disabilities often cannot access existing health and care information;

ii. access to online records raises safeguarding risks for vulnerable individuals;

iii. people who do not have a fixed address (such as some Travellers and the homeless) will not necessarily have access or know how to obtain an NHS number; and

iv. confidentiality and consent is a concern for many; whether they be a young person who does not want information shared with their parents, a person who is Lesbian, Gay, Bisexual or Transgender (LGB&T) who does not want their personal information shared with all health and care professionals or a person being cared for and needs their carer to access some of their health and care record.

The actions planned or currently being taken forward to address any potential negative effect on equality are detailed in the 'Action planning for improvement' (page 22) section of this document but they include:

i. making clear that information that is available online must always be available in other formats, where necessary (including face-to-face and assisted learning/support needs);

ii. encouraging the NHS and local government to do more to offer support to people who need help in accessing and understanding information, so that no parts of society are unfairly disadvantaged;

iii. giving access to electronic services and health and care records and asking the Royal College of General Practitioners to review its guidance on access to records with reference to safeguarding;

iv. making the NHS number a standard identifier on a persons health and care record. Though the strategy will explain how we can help those providing our care by, wherever possible, knowing and being ready to quote our own NHS Number, it will also make clear that ‘Some of us may not remember or know how to access this, and, for those reasons our records will always be identifiable in other ways.’;

v. encouraging greater collection of data relating to the Equality Duty protected characteristics; and

vi. a review (to be led by Dame Fiona Caldicott) of the current information governance rules and their application, to ensure that there is an appropriate balance between the protection of confidential and identifiable information within our health and care records and the use and sharing of information to improve the quality and safety of our own care and for the benefit of wider society.

For a more detailed discussion of the above issues please see the *Equalities Impact Assessment* for *The power of information*.

Annex A: Clinical Information Systems

The NHS was an early adopter of IT systems in the 1970s with the use of mainframe computers providing patient administration support and pathology laboratories automated testing services.

In 1980, Mrs (later Dame) Edith Körner was asked to chair a full-scale national review of the way information was generated and handled in the NHS.

The Körner Committee studied the matter for four years and produced six major sets of recommendations, all of which were adopted and put into action by the Government. The committee's work paved the way for widespread computerisation in the health service to support the collection of data recommended by the reports. For the next twenty years, the statistical information used to monitor the work of the NHS was known as 'Körner Data'.[35]

Douglas Black, then President, Royal College of Physicians of London, commented:[36]

> *The Körner Report is a substantial and clearly written document of 219 pages. Its introductory section explains that it has focused on hospital-based activity at district level with a view to delineating the minimum set of data required by district authorities; some consideration is also given to the data appropriate for transmission to the regions and to the Department of Health and Social Security. The information needed for management is derived from three main sources activity data, health services manpower data, and financial data.*

Körner activity data (30 years on), still forms the basis of resource distribution across the NHS, particularly secondary care, through contract/commissioning datasets. The proposals were less successful for mental health and community health services.

At the heart of the Körner, data set is unit of care called the Finished Consultant Episode (FCE). Simple admission to hospital would be made up of one FCE. More complex cases where the responsibility for care is transferred from one consultant to another an admission in hospital could consist of two of more FCEs.

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[35] http://en.wikipedia.org/wiki/Edith_K%C3%B6rner

[36] BRITISH MEDICAL JOURNAL VOLUME 285 30 OCTOBER 1982, Reproduced at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1499819/pdf/bmjcred00630-0009.pdf

Mainly for administrate purposes the FCE records the length of time a patient was being treated, what procedures they underwent[37] and an internationally recognised code of condition.[38] The latter is derived from a patient's clinical record, often by specialist clinical coders using semi-automated systems. For example typing 'appendicitis', may return the possible codes for different manifestations of the condition and enable the coder to select the best fit code based on review of the content of the clinical record.

Clinical record keeping has in some cases been moved from paper based to computer based systems, particularly in general practice. However it is still not uncommon to find in hospital and community setting paper based record keeping, although these may include printouts from computer based systems. Most laboratory systems provide facilities either to print patient investigation results, or transmit them electronically, typically to a results reporting system.

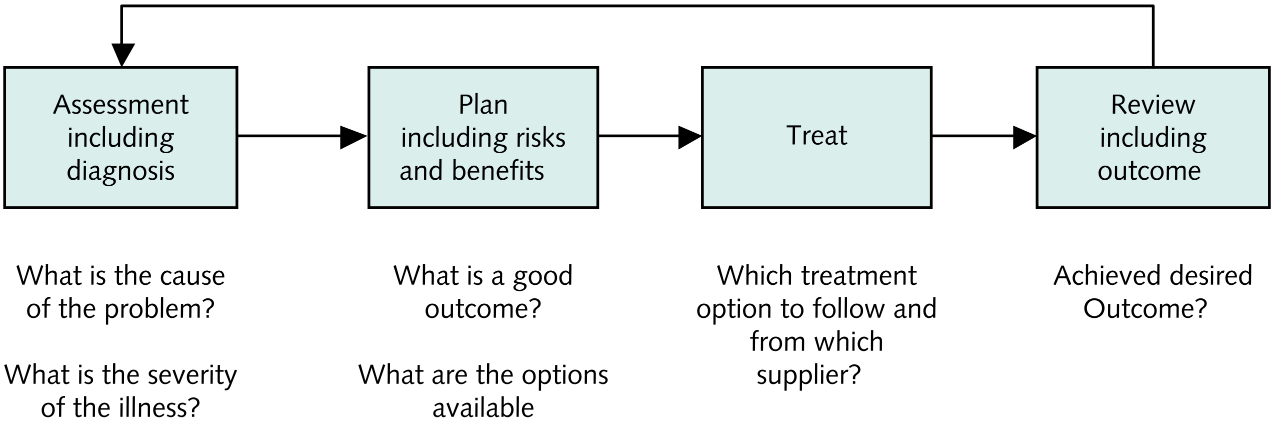
The clinical record of a person will contain historical information reflecting medical history, symptoms, results of examinations and tests, drugs prescribed, treatments and diagnosis. In its simplest form it helps medical personnel keep track of an individual between consultations as well as providing a professional audit trail to inform future interventions in the patient's care.

A simple representation of the process is shown in figure annex A.1.

From the patient's perspective the pathway along which they have to travel, from first presentation to resolution, may take some time and many interactions with different providers.

Currently if a patient requires hospital-based treatment via a GP referral, the end-to-end process should take less than 18 weeks but may require a number of visits to different doctors and clinical departments.

Figure Annex A.1 a simple representations of the steps which would be captured in a clinical information system.



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[37] http://www.connectingforhealth.nhs.uk/systemsandservices/data/clinicalcoding/codingstandards/opcs4/index_html

[38] http://www.connectingforhealth.nhs.uk/systemsandservices/data/clinicalcoding/codingstandards/icd10

The action to better support patients' information need to meet the commitment *no decision about me without me* has to recognise the full picture of conditions requires the assimilation of a range of data held in different forms. It can take fully trained medical professionals some time to read, digest and synthesise the information in medical records in order to take appropriate action and advise patients. This process may be complicated when records are non-continuous such as when patients are referred to other providers for specialist care or care is provided in parallel to treat different aspects of a condition.

Sometimes clinical decisions have to be made with incomplete or contradicting evidence.

The transfer of care from one professional to another is usually accompanied by a letter summarising a patient's condition. To be done well this requires a high degree of expertise and can take some time to assimilate all the information available.

For a number of years coding standards have been advocated to streamline medical record keeping and improve the ability to inter-link records to form a continuous record either in real or virtual form.

Currently there are differing standards for Health and for adult Social Care in the UK, in Europe and worldwide. There are differing standards in primary and secondary care coding structures e.g. READ, ICD, and SNOMED.

There were 6 main and 5 sub divisions of standards for electronic records introduced in Information for Health based on functionality of the record similar to the HIMMS analytics organisation. http://www.himssanalytics.org/docs/wp_emr_ehr.pdf. There are four standards of interoperability in the Interoperability Tool Kit currently used for 'Connect All' strategy in the NHS.

Benefits come from sharing records wider than the local environment in which they are normally used [39] and can be defined at three levels:

> *Interoperability is defined as the ability to exchange, understand and act on patient and other health information and knowledge among linguistically and culturally disparate clinicians, service users and other actors, within and across jurisdictions, in a collaborative manner. Three levels of interoperability can be distinguished, which are potential interoperability, limited connectivity, and extended actual connectivity.*

The report goes on to say:

> *The EHR IMPACT cases show that interoperability is a prime driver of benefits from EHR and ePrescribing systems. Benefits rely on access to information regardless of place and time. Local, closed ICT systems lacking interoperability would not release*

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[39] http://www.ehr-impact.eu/downloads/documents/EHRI_final_report_2009.pdf

> *these substantial gains. Interoperable EHRs, whether as actual files or as virtual files in a network of data stored in several databases, are foundations of health information systems and support to other systems, such as ePrescribing, eBooking, management, administrative or logistics systems. Without interoperability between EHRs and other clinical and non-clinical systems, neither could realise their full potential.*

For over a decade, the Department's policy views has been that SNOMED should be the standard accepted across all clinical recording, but adoption has been slow and patchy.

In particular in general practice the READ code system is preferred in primary care, possibly because it was originated by a general practitioner. SNOMED was originally developed to report on pathology samples and contains over 300,000 code combinations.

In the absence of well coded recording system is difficult to see how secondary uses, and in particular patent centred systems can be used to make use of the full wealth of information which is currently recorded, typically by relatively expensive clinical staff.

The staff investment in terms of time and action to move to an integrated system has been identified by the EHR IMPACT study:

> *A key feature of interoperable EHR and ePrescribing systems is that the impact on healthcare professionals and other team members is significant. In some cases, they have over 40% of the value of positive and negative impacts. On the negative side, this includes personal commitment in building up the system, investing free time, and inconveniences and irritations during implementation phases. The latter last anything between a couple of weeks and six months to a year, depending on the system in question and the personal affinity to technology of the healthcare team member. Longer lasting negative effects are less common. It is also observed that younger people adapt and endorse technology faster than older professionals.*
>
> *Interview partners insisted on not wanting to return to a pre-eHealth working environment, as it would be too burdensome, clumsy, and prone to mistakes. This result is consistent with the findings of a recent study in the US, which claims that 'physicians who receive training in a technology-rich environment but go on to work in a less modern facility feel they can't provide safe, efficient care as they could have with information technology'.*[40]

This would suggest that requiring teaching hospital and training GP practices should be early adopters of digital recorded and coded clinical record keeping.

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[40] Johnson, KM/Chark, DM/Chen, QP/Broussard, A/Rosenbloom, STM (2008): Performing Without a Net: Transitioning Away From a Health Information Technology-Rich Training Environment In: Academic Medicine. Vol. 83, 12: 1179-1186.

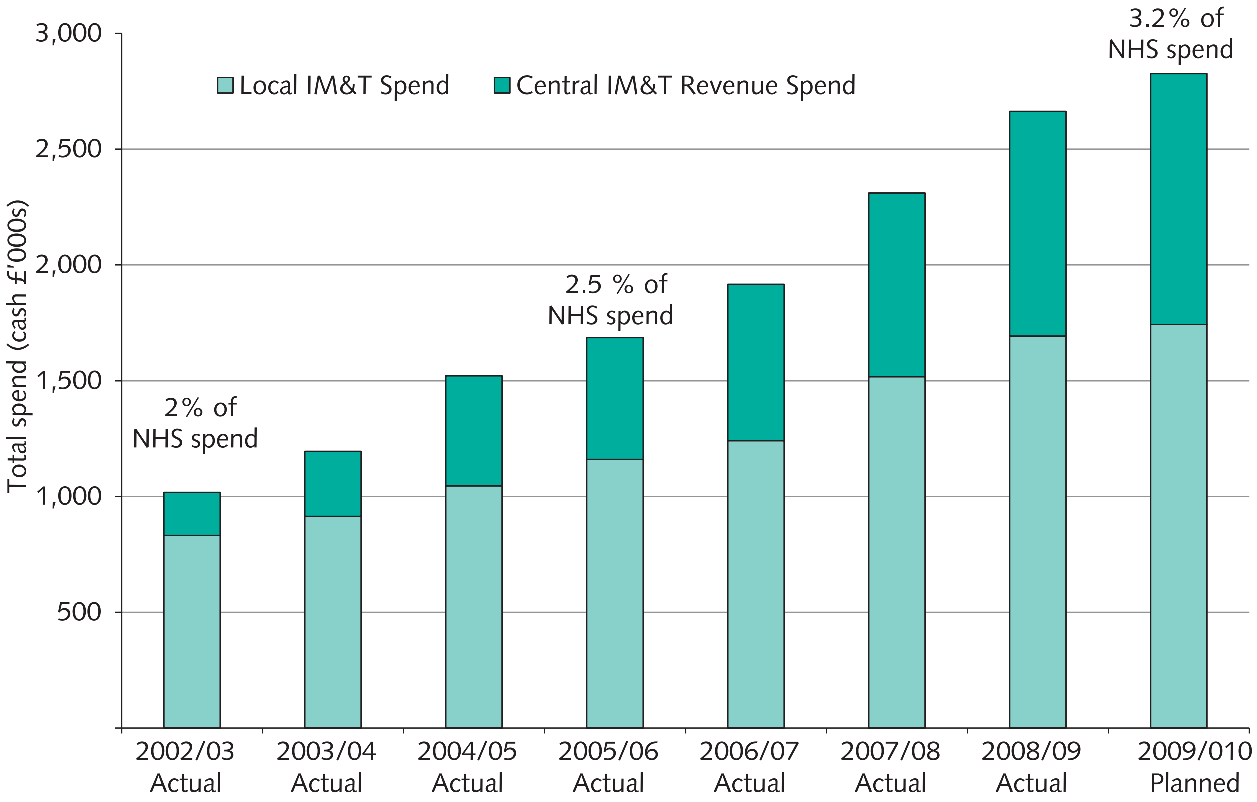
It is easy to criticise the early emphasis on computerisation of simple activity transactions in the NHS, represented by Körner datasets. This was in part due to the limitations of what was technically possible in terms of computer processing power, storage capacity and network technologies, but also due to a pragmatic approach of setting targets that were realistic and achievable. Thus, information captured and linked about a patient was limited to that which was generated in directly managed units within the same district health authority.

Annex B: Estimating NHS Expenditure on IM&T

The first attempts to estimate the total amount spent by local NHS organisations were made in 2000, which provided the £800m/year figure quoted by Derek Wanless. From then until 2009, an annual voluntary assessment was completed by most NHS organisations. Each year, the scope and definitions used in the survey were refined in the light of previous returns. Expenditure headings include computer hardware, software, local networks, support, maintenance and staffing costs. The results of these surveys are shown in Figure B1, together with central spend, the bulk of which, since 2003/4 has been via NPfIT. Although not a mandated return 321 NHS organisations completed the survey in 2009. A number of NHS Foundation Trusts opted not to participate.

Based on the annual voluntary assessment returns it has been estimated that expenditure on Information Technology and Management (IM&T) in health is currently around £2bn/year allocated locally and up to an additional £1bn spent nationally. Trusts published accounts data suggest a lower spending figure but this may in part be due to IM&T staff being included in other budget headings. The growth to this level of spending achieved the anticipated funding anticipated in the Wanless Review for the fully engaged scenario. This spend has given us a range of local solutions to clinical recording driven by local business cases, plus a high quality national level view of activity and performance.

Figure AB1: Local and central spending on IM&T



Source: DH analysis of annual returns – cash.

It was estimated in 2000 that 60% of this combined spend funds clinical based systems and 40% business systems (finance, activity, performance and other non-clinical systems). In the 2007/08 survey the estimate was 67% of NHS users were clinical users and 33% business users.

Primary care electronic records systems costs currently around £125m/year. This is split by £75m spent centrally on acquiring replacement systems and common infrastructure (via Connecting for Health) and £50m/year on running costs (paid for by PCTs through the allocation). This investment permits the almost universal electronic recording primary care transactions and clinical records, frequently using the Reed code system.

Annex C: Risk register for option 2

THEME 1 Information to help service users to participate in no decision about me without me	Risks	Likelihood	Impact	RAG
1. All NHS Patients will have secure online access, where they wish it, to their personal GP records by 2015 (by the end of this Parliament). By 2015, all general practices will be expected to make available electronic booking and cancelling of appointments, ordering of repeat prescriptions, communication with the practice and access to records to anyone registered with the practice that requests these services	All patients do not take up opportunity to access and share their records	3	3	9
4. The Government has asked the Royal College of General Practitioners, working in partnership with patient groups and other professional organisations to lead development of a plan, policy and procedures to support patient access and engagement with their GP records	Plans, policies and procedures not in place in time to meet 2015 deadline	1	3	3
3. Patients will be able to view online which GP Practices offer online access to records by 2013	GPs do not make information available in time to meet target	1	2	2
5. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • identification and authentication of patients and service users, in conjunction with other public services • capability to enable us and our professionals to locate accessible electronic records held by all the services we have used • ways of sharing electronic copies of their records with people and organisations of their choice who can help in understanding and managing their health and care **10.** The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	Roadmap to standards not in place or delayed, which in turn delays local investment plans	2	4	8

THEME 1 Information to help service users to participate in no decision about me without me	Risks	Likelihood	Impact	RAG
14. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders will, in line with the roadmap for the health and care sector to make all data open, and to continue to improve the information available to better support transparency and patient choice, this will include: • simpler health and care performance metrics on the online portal	Agreement not reached on summary metrics for performance	1	2	2
14. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders will, in line with the roadmap for the health and care sector to make all data open, and to continue to improve the information available to better support transparency and patient choice, this will include: • the Health and Social Care Information Centre publishing all nationally held clinical data by April 2014, where possible by clinical team	NHS CB does not complete necessary work to meet target	2	2	4
17. The Health and Social Care Information Centre will provide a secure data linkage service, complemented by the research data linkage service, this will be in place September 2012	Difficulties in implementation mean linkage service is not delivered in time	3	3	9
23. NHS organisations should actively seek out, respond positively and improve services in line with patient feedback. This includes acting on complaints, users' comments, local and national surveys and results from 'real time' data techniques.	The feedback adds costs of collection and analysis but does not lead to service improvement	3	1	3

THEME 2 Crossing clinical information boundaries	Risks	Likelihood	Impact	RAG
2. All Patient data* (in publicly funded health and social care) should be identified by the NHS number as the primary identifier at the point of care by 2015. Local authorities are committed to working towards much better integration of our health and care information and the consistent use of NHS numbers *some exceptions apply, for example small voluntary organisations and for specific public health services	All local organisations do not complete work to enable NHS Number to be used at the point of care	3	4	12

THEME 2 Crossing clinical information boundaries	Risks	Likelihood	Impact	RAG
5. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders to lead and coordinate plans to facilitate and enable establishment of the infrastructure for patients and service users to have secure online access to all their health and care records, this will include: • identification and authentication of patients and service users, in conjunction with other public services • capability to enable us and our professionals to locate accessible electronic records held by all the services we have used • ways of sharing electronic copies of their records with people and organisations of their choice who can help in understanding and managing their health and care **10.** The Department of Health has already announced an independent review of information governance, led by Dame Fiona Caldicott	Roadmap to standards not in place or delayed, which in turn delays local investment plans	2	4	8
9. All Providers of NHS funded care (including Social enterprises and AQPs), as part of their commissioning contracts with the NHS, will be given access to a limited number of NHSmail accounts to facilitate secure email communication where this is cost effective	Programme of work not completed to enable all provides to operate with secure communication	3	4	12
15. The NHS Commissioning Board will lead and coordinate work on developing commissioning data sets (the main data collection from secondary care) to allow data returns in SNOMED CT from April 2014	National implementation does not deliver and so does not provide suitable architecture in time for local organisations to make changes to local systems	4	3	12
25. Providers and Commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions. **8.** The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information	Evidence not sufficiently compelling for all NHS organisations to complete changes to local systems – target only partially complete or patchy	4	4	16

THEME 2 Crossing clinical information boundaries	**Risks**	**Likelihood**	**Impact**	**RAG**
18. The Department of Health and NHS Commissioning Board will work to pilot new ways to incentivise the use of integrated barcode medication administration systems in care homes by September 2014, including the use of Social Impact Bonds, with the results informing future plans for implementation across England	The re-focused fund does not provide innovative and cost-effective solutions for information sharing	3	2	6
25. Providers and Commissioners are encouraged to implement personal and professional access to view records across specialties and settings through 'portals' or other solutions	Evidence not sufficiently compelling for all NHS organisations to complete changes to local systems – target only partially complete or patchy	4	4	16
24. Providers and Commissioners should communicate electronically rather than using the post where possible – minimising the delay in treatment pathways and reducing manual processes	Progress is slow towards reduction of manual processes and benefits not realised	2	2	4

THEME 3 The right clinical information following the service user	**Risks**	**Likelihood**	**Impact**	**RAG**
8. The Department of Health, NHS Commissioning Board and Public Health England will work with national stakeholders, in particular including Monitor, Care Quality Commission and Royal Colleges, to publish a roadmap setting out a programme of work setting and ensuring implementation of standards for national and local networking of systems and enable effective sharing of direct care information including: • professional record keeping – (for instance the academy of medical royal colleges records standards and social care assessment)	Roadmap to standards not in place or delayed, which in turn delays local investment plans	2	4	8

THEME 3 The right clinical information following the service user	**Risks**	**Likelihood**	**Impact**	**RAG**
21. Commissioners and Regulators should, through regulatory and contract frameworks, assure that information system procurement decisions are underpinned by robust business cases which ensure effective VFM and benefits realisation and that are in line with published information standards	Providers and commissioners procure systems that do not conform to national standards on the basis of local business decisions. Also some relatively new 'legacy' may have many years economic life, yet not conform fully to standards	2	4	8
23. Providers should ensure they assess the capability and meet the training needs of their clinical and care professionals in the best practice use of information as part of their routine development planning	Providers do not prioritise training	3	4	12

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