



Public Value and e-Health

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ippr 2004



Acknowledgements

I am very grateful to those who have supported the ippr's work on public value and e-health: Atos Origin, BT, HP, Microsoft, the CWU and Marconi. Without their generosity this report could not have been written.

I would also like to thank all those who have contributed their ideas and time to this project. This includes those who have presented at and attended the series of seminars that have informed this report. A special acknowledgement must go to Ian Kearns whose work on public value and e-government has informed the approach taken throughout the project. I would also like to thank James Crabtree, Richard Darlington, Will Davies, Matt Jackson, Emily Keaney, Nick Pearce and Howard Reed for their advice. However, the views expressed in this report are solely those of the author.

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Executive Summary

Discussions about how Information and Communication Technology (ICT) might be used to improve health and healthcare have been going on for some time. In the last few years however, the amount of discussion as well as the amount of money being spent in this area has increased rapidly. In this report we take a broad look at the role of ICT in health, examining the rationale for its use, the government's policy approach and some high profile projects. We go on to examine the evidence that e-health is delivering real value and, discovering that clear benefits are yet to be shown in practice, we look at the possible reasons for this. First, we suggest that perhaps benefits *are* being delivered but that we have just been unable to measure them so far. Given that effective evaluation is crucial if future projects are to be successful and there is to be appropriate support for the use of ICT, we look at problems that exist with current evaluation practices. Second we turn to the possibility that benefits are not being seen because significant barriers exist to the delivery of value through the use of ICT in health and give details of those possible barriers. Then, in order that the potential that we outlined first is delivered, we make recommendations that would help e-health deliver real value and would ensure that it is measured properly.

Could information technology lead to better health and healthcare?

We certainly believe that better use of ICT could help us to improve public health and healthcare provided by the National Health Service (NHS). Specifically, ICT will be crucial in achieving the government's aim of providing more patient centred care. The ippr has, in previous work (Kendall & Lissauer 2003), identified high quality patient centred care as that which is safe and effective, promotes health and wellbeing, is integrated and seamless, is informing and empowering and is timely and convenient. It is possible to envisage different ways in which ICT might help various groups such as patients, the public, health professionals and managers play their part in delivering this vision.

Information for patients

Patients will in future be likely to take greater control over their own care. This may mean more choices about when, where and by whom they are treated and also more involvement of patients in decisions about specific treatments or drugs. Government attempts to introduce greater patient choice into the health service will only be successful and lead to better care if patients are well informed about the decisions that they are taking. ICT could play an important role in ensuring that patients have access to information about healthy living, healthcare and the NHS through the web, interactive television or through mobile technology.

Performance information for the public

As well as needing better information about how to remain healthy, the public will also likely want to access information about the performance of the NHS in order that they can become more closely involved in health policy decisions. Access to this kind of information should also be facilitated by ICT and in addition, emerging methods of electronic participation and consultation might enable greater account to be taken of the public's views.

Information for professionals

A move towards better quality, patient centred care will also pose challenges for health professionals that might be met with the aid of new technology. Electronic records would allow professionals to access accurate information about patients, enabling care to become more seamless and the health service to be more flexible about when and where patients are treated. Patients may not have to travel so far if telemedicine means professionals can treat them remotely. Digital technology should also mean health professionals can keep up to date with the rapidly growing body of medical knowledge and can develop their skills whenever and wherever it is convenient for them to do so.

Management information

Finally, technology could play a significant role in improving the management of the health service. By enabling better information to be gathered about when and where people are suffering from disease and are being treated ICT should enable the NHS to direct its limited resources more effectively and to plan better for the future. The use of ICT may help the health service to become more efficient in other ways too; e-procurement for example could lead to considerable savings given the quantity of goods and services purchased by the NHS.

How has the government attempted to exploit this potential?

Since 1997, the government's determination to improve the health service has been matched by its enthusiasm for using ICT in delivering that ambition. *Information for Health*, published in 1998, made the argument for better use of ICT in the NHS, set out many of the possible uses of information mentioned above and has determined the broad approach of the strategy for the subsequent years. However, more recent events have altered the policy context around ICT and health. First, in 2000 The NHS Plan, the government's ten year strategy for the health service, was published and reiterated that ICT had a crucial role to play in facilitating the move towards patient centred care. Then, more crucially, in 2002 came Derek Wanless' report on the future funding of the NHS.

Wanless recommended a doubling of spending on ICT in the NHS, citing the low level of investment compared to other sectors and countries and also highlighted inadequate setting of standards for use of ICT as a reason for previous failure in this area. The response to this



criticism was the launch of the National Programme for IT in the NHS (NPfIT). With £2.3bn of funding and a centralised programme of procurements, NPfIT is likely to revolutionise the way ICT is used in the health service.

The three flagship projects of NPfIT are electronic patient records, electronic booking systems for appointments and electronic transfer of prescription information. Each of these aims to meet some of the information needs listed above:

- The NHS Care Record Service (NHS CRS) should ensure that accurate details of patients' conditions and treatments are available to the professionals treating them wherever and whenever that treatment is occurring. This should lead to more integrated care, services that are more convenient for patients and should also improve health outcomes as patients' records will always be available.
- If the government's plans to increase the amount of choice available to patients in the NHS are to be delivered successfully, the electronic booking system will be crucial. Once it is rolled out, patients will be able to book appointments with specialists from their GP's surgery or from home. It is hoped that as well as giving patients greater control over where and by whom they are treated, this should reduce the number of cancellations by ensuring that appointments are at times that are convenient for patients.
- Given the laborious process that currently takes place in order for patients to get their prescribed drugs from pharmacists, it is unsurprising that being able to transfer prescription information electronically is seen as a key objective. The new electronic systems should automate a largely paper-based process that happens over fifty million times each month, potentially delivering considerable savings and reducing levels of fraud.

In addition to these services now to be delivered through NPfIT there is a great deal of ICT related activity occurring at a local level within the NHS, for example in the area of telemedicine. There are also further large projects such as the National electronic Library for Health, NHS Direct Online and the provision of health related information using digital television that are being led nationally. Again, these look to meet the information needs of the NHS:

- A large amount of information for health professionals is currently available, free of charge, through the National electronic Library for Health (NeLH). By providing the most recently available medical knowledge and evidence online, NeLH is intended to facilitate

the practice of evidence based medicine. This in turn should lead to better health outcomes for patients.

- NHS Direct Online is a key element in the government's attempt to provide high quality health related information and advice to patients and the public. The web-based service provides health related information such as a health encyclopaedia and self-help guide as well as information on local NHS services.
- This kind of information will also shortly be available nationwide to those with digital television through NHS Direct Digital TV. It is hoped that providing this information will help improve public health and also encourage appropriate use of health services.

The development of these and other services amounts to a considerable political and financial investment aimed at improving the use of ICT in the NHS. This investment is appropriate given that these projects seek to meet the genuine information needs of the health service and we would expect to see it delivering benefits.

Have we seen clear benefits delivered in practice?

Despite the clear *potential* benefits of improving use of ICT, really solid evidence of a positive impact in practice is still quite scarce. In total, we examined over forty different evaluation reports related to the six services described above in our search for evidence. In doing so we have used a concept known as public value. As an analytical framework referring to the value created for citizens by government, public value can be used to aid decision making, to assess performance and, in relation to ICT, to provide a bridge between the technology and wider policy communities. We have looked for evidence that ICT is helping to deliver sources of public value such as better value for money, greater satisfaction with services, improved health outcomes or greater trust in the NHS:

- Improving value for money in the delivery of health services is a key objective of the Department of Health and ICT should be able to play a role in this by reducing administration costs and improving access to management information. We did find some evidence that this was happening. Some pilots of electronic health records suggested that they might lead to time savings for staff or the avoidance of unnecessary appointments. Evaluation of NeLH also showed that cost might be reduced by delivering time savings for staff wanting to access medical information.
- Satisfaction with NHS services can often act as a useful indicator of service performance and in the health context maintenance of satisfaction is essential to ensure continued support for the NHS as a national institution. We found good evidence from just two of

the six projects listed above that effective use of ICT was likely to increase patient satisfaction with health services. First, while not showing conclusively that access to their own health records made patients feel more empowered, some pilots of electronic records suggested that having that information made patients at least more interested in and likely to understand their own health. Second, participants in trials that used interactive television to provide health related information seemed to believe that the information they had accessed had helped them in their dealings with their doctor and also helped to improve their condition.

- Improvements in the health of patients and of the public are clearly desirable with self-reported health being strongly associated with individuals' life satisfaction and improving health outcomes is a politically important target for the Department of Health. We found little evidence of ICT improving health outcomes. This is clearly disappointing. Evaluations of the pilot of NeLH did, however, conclude that consistency in health information resources will ensure that more decisions are made on the basis of reliable evidence across the country. This is likely to lead to improved health outcomes and reduced geographical inequality of outcomes.
- Finally we looked for evidence that ICT had increased levels of trust in the NHS. Our research showed that the use of ICT in the health service presents both threats and opportunities in relation to trust. On one hand, there is some evidence from pilots that used digital television to deliver health information that successful use of ICT might help to raise levels of trust in the NHS. On the other hand it seems that public understanding of the way that the health service uses information and might use it in the future is quite basic. This leaves open the possibility that trust in the NHS might fall dramatically should the public first become aware of ICT use in the health service in the context of, for example, abuse of personal information.

There is then emerging evidence to support the claims that improved use of ICT in health will lead to the creation of public value. However, given the number and size of the projects and evaluations that we have examined, we have found a surprisingly small amount of convincing evidence that ICT can deliver greater public value in health.

Maybe we just can't see the improvements because we're not looking for them properly?

It is certainly possible that the projects we examined did deliver real benefits but that they are not evident because evaluation of ICT use in health has been inadequate. This should cause us concern because effective evaluation serves two important purposes:

- First, evaluation ensures that future projects are as successful as possible by enabling us to learn lessons from the past. Too often the lessons that could have been learned from the huge number of e-health projects that have happened already have been missed because of underevaluation. Effective evaluation is also likely to improve the development of ICT projects by assessing project management processes and enabling comparisons between outcomes and a priori justifications for projects.
- Second, only by building a convincing body of evidence on the effectiveness of better ICT use in health will it be possible to persuade professionals, patients, policymakers and the public that spending on ICT projects is worthwhile. Until now, greater use of ICT has often been seen as a good in of itself as part of a process of modernisation. This is unlikely to be the case in future and appropriate use of ICT will have to be argued for and supported with evidence that spending on ICT will deliver benefits. Good evaluation is crucial if that evidence is to be available.

During our search for the public value created through the use of ICT in health, it became clear that there were four main reasons why there was less solid evidence available than we had hoped there would be:

- Too often it simply seemed that too little time and too few resources had been allocated to evaluation. In some cases this meant that those running the projects had had to focus almost solely on getting systems up and running and had little time to dedicate to evaluation. This paucity of detailed evaluation work on the ground meant there was insufficient information on which evaluations could draw. In some projects evaluation was sub-optimal simply because the projects were hit by delays and evaluation timetables weren't flexible enough to take account of this.
- The rationale for evaluation often seemed unclear and this had led to inappropriate evaluation frameworks. If evaluations are to be useful it is important that it is clear what they are intended to achieve. In particular, as projects should have a clearly articulated justification, the evaluation should be linked to that justification and the intended aims of the project. This is particularly important if evaluations are going to help build appropriate support for future projects.
- We also found that often there was not sufficient appropriate data available to enable evaluation of e-health projects. By the time projects conclude it is too late to begin collecting this data if it is to be useful in determining the effect of new systems. In future the measurement of key indicators in evaluated studies must begin before projects start in order to set baselines which might be used to establish the value of these systems.

- Finally, there were some areas where we had concerns about the robustness of evidence presented and the way in which it was used to inform the conclusions of evaluations. For example, it was sometimes unclear where findings were derived from personal testimony rather than some more objective measurement and there was occasionally confusion between benefits that had actually been delivered and those which were anticipated in the future. In addition, in some instances it seemed that selected pieces of evidence suggesting the delivery of real benefits had been given excessive prominence in the development of evaluations' conclusions.

We were surprised by the disparity between the obvious *potential* benefits of using ICT more effectively in health and the paucity of evidence that these benefits are being delivered in practice. Certainly these problems with evaluation processes provide one possible explanation for that: that benefits are being delivered but we just cannot see them or link them to improved use of technology.

But maybe there are real problems with the way we're trying to use technology?

Although there are problems with the conduct of evaluations, it is possible that benefits are not just being delivered unseen. Significant barriers to the successful use of ICT in health have been identified in the past and it is certainly possible that some of those barriers are continuing to prevent the delivery of benefits through e-health projects. Four groups of potential barriers are worth highlighting:

- First, in the past there have been problems with the funding of ICT related projects and the procurement of associated systems. The Wanless report called for a doubling of spending on ICT in the NHS and the Npfit has certainly led to an increase in centrally allocated funds. However, this high level of central funding isn't necessarily guaranteed into the future and local funding for ICT and associated change management remains vulnerable. Funding for ICT projects has previously often been diverted into other areas to meet short term goals and there remains a danger that this may happen in future.

The health service also seems to have performed poorly in its procurement of new ICT systems. There has often not been the capacity to procure appropriate systems and by failing to take a co-ordinated approach to procurement the opportunity to fully exploit the health service's huge buying power has often been missed. The centralisation of procurement of some ICT systems under Npfit has certainly meant much speedier procurement. However, it still remains to be seen whether this will translate into greater benefit on the ground and whether this new procurement approach will be applied across the health service, including at a local level. One area where the Npfit has certainly had

a positive impact is in negotiating lower prices for widely used software by making deals with suppliers at a national level.

- Second, there has too often in the past been insufficient attention paid to the full and early involvement of ICT systems' users. Effective consultation with health professionals is crucial if new ICT systems are to be a help rather than a hindrance to them in their work, if support for new systems is to be developed in order to ensure their use and if the training needs of users are to be accurately ascertained. However, this is unlikely to be simple with significant barriers existing to the use of ICT by health professionals. There may be fears of increased workload, concerns about impacts on the confidentiality of both patients and professionals as well as about possible new constraints on current professional freedoms. There are also ethical and legal uncertainties that will need to be resolved before professionals are likely to be entirely comfortable using new technology.

Concerns have been raised about the level of professional involvement that has been conducted as part of NPfIT. For example, surveys of doctors and nurses have repeatedly showed that they are highly willing to be involved but that so far, very few have been consulted. Of course there is a balance to be struck between no consultation whatsoever and speaking to every professional in the NHS and efforts to involve professionals do seem to have increased in recent months. It still remains to be seen, however, whether involvement of professionals has happened early and comprehensively enough to deliver systems that will be welcomed, used and will prove useful to those on the front line within the health service.

- Third, it remains unclear how patients and public will react to greater use of ICT in health. The public can envisage that many of the ICT related services currently being planned such as electronic health records or e-booking systems might bring them benefits. Certainly in some of the projects that we examined, such as those providing health related information using digital television, users were enthusiastic about the new services on offer. However, as we mentioned above, public understanding of the way that the NHS uses information at the moment does not appear to be well developed. This means that there remains the possibility of a public backlash against greater use of ICT in the NHS unless account is taken of public attitudes. It is therefore important to recognise that the public do have concerns about the security of new ICT systems and about who will be able to access their personal information.

In systems being developed through NPfIT, the decision has been taken that patients' information will be shared according to certain rules unless they choose to specifically opt out. The intention is that an awareness building campaign will happen before any

patient's information is shared using the system in order that people understand how the system will work and have the opportunity to opt out if they wish. This opt out system has been criticised by some and the success of the planned awareness building campaign will determine whether it comes to be seen as acceptable by the public.

- Finally, although new ICT systems have been procured for the NHS, in order for the anticipated benefits to be delivered there will have to be significant changes to the way the NHS works in order to take full advantage of the greater availability of information. There are two potential barriers to the successful completion of this change management process. First, control over NHS ICT might have moved from being too devolved to too centralised. This could potentially make systems insufficiently flexible to take account of useful variations in local working practices and might also lead to trailblazing NHS organisations being held back. Second there may simply be insufficient capacity within the NHS to cope with the magnitude of change that will be required. Managers, health professionals and specialist health informaticians are all extremely busy and may not have the time to make sure that the change is a success. Inadequate funding, insufficient skilled staff and the competition of other priorities may mean that although ICT systems have been procured, the benefits delivered will not be as great as they might have been.

While these barriers all offer possible explanations for the fact that few benefits are evident from previous e-health projects and may yet adversely affect future projects, none is insurmountable. In fact, attempts to remedy them are likely to go a long way towards ensuring that future projects do clearly deliver real public value.

So how can we improve things in the future?

In order to ensure that the use of ICT in attempting to improve health and healthcare is being successful and that this success can be demonstrated, two things must happen. First, efforts must be made to ensure that barriers to the effective use of ICT are overcome so that use of technology can help deliver public value. Second, evaluation practices must be improved so that future projects can learn from past mistakes and so that when benefits *are* delivered, they can be used to develop appropriate support for the use of ICT in health.

To overcome barriers to the successful use of ICT in health:

- Funding decisions on future projects should be based on estimates of the level of benefits that they are likely to deliver.
- Procurement processes should be subject to evaluation in order that the lessons from them are properly learned and new, innovative procurements should be trialled.
- Involvement of systems' potential users should be extensive, should happen early and should be a condition of projects obtaining funding.

- Similarly projects seeking funding should demonstrate that they have considered and will continue to examine the acceptability of proposed services to patients and the public.
- Assessment of the necessary time, skills and funding required to ensure effective change management should occur before ICT projects are approved.

To ensure that benefits, where they are delivered, can be demonstrated:

- Evaluations should be clearly linked to the stated aims of the projects under examination in order that their level of success can be determined.
- Adequate time and resources should be allocated to evaluation.
- Appropriate data should be gathered with which to examine the effectiveness of projects, including the setting of baselines before implementation against which the project can be judged.

Failure to overcome the barriers set out above and to convincingly demonstrate success would have serious consequences. First, it would amount to an inability to justify the spending of several billion pounds on ICT for the NHS in terms of better services, improved outcomes or higher levels of trust. Second, given the high profile nature of NPfIT, there would likely be an effect on the use of ICT across the public sector. Government ICT projects already have an unenviable reputation for failure and if NPfIT is not seen to be successful that perception is likely to be reinforced. This could result in many potential benefits of better ICT use being missed.

Introduction

Debate around the use of Information and Communication Technology (ICT) in health is livelier today than ever before. ICT has historically not been used well in health and this has often been highlighted. However, it was the critical words of Derek Wanless in his 2002 report that led to increased spending and renewed political focus on the use of technology. At the same time new policy agendas are developing that are likely to make the effective use of ICT ever more crucial in delivering the government's objectives. Introducing greater levels of patient choice for example, will prove extremely difficult unless technology is used to manage information more effectively. It is in this context that this report is published, looking both at past use of ICT in health and at its use in the future.

In chapter one we make a strong case for more effective use of ICT, setting out the potential positive impacts of ICT in health. Delivering greater choice to patients, encouraging more appropriate use of NHS services and developing the skill levels of the NHS workforce are all challenges that necessitate better access to information. ICT may help to help deliver these and other government objectives. This potential has been recognised by the government and in chapter two we overview the progress that has been made since 1997 in trying to improve the use of information technology in the health service. Chapter two examines both changes in the broader policy agenda and the development of specific services, such as electronic patient records.

In chapter three we show the extent to which use of ICT in the area of health can be demonstrated to have delivered real benefits. While some positive impact can be discerned, having drawn on a considerable number of evaluations of ICT and health related projects we are forced to conclude that, as yet, a coherent body of evidence demonstrating the positive impact of ICT does not yet exist. In chapters four and five we present possible explanations for this.

First, in chapter four, we make the case for more effective evaluation of ICT projects, arguing that this is important in order to maximise the benefits delivered in future projects and also to build appropriate public and political support for use of ICT in health. Chapter four also highlights some problems with the evaluations that we examined that might have prevented evidence of benefits from being uncovered. While the paucity of evidence of benefits may simply be a consequence of poor evaluation, it may also signify that benefits simply aren't being delivered. In chapter five we look at possible barriers to successful use of technology in health such as inadequate involvement of systems' potential users in their design and implementation.



Finally, in chapter six we make recommendations intended to ameliorate problems with evaluation processes and to reduce the impact of potential barriers to the delivery of benefits through improved use of ICT.

Chapter 1: Why use ICT in health?

In health, as in many areas, effective use of information technology has often been seen as peripheral to many of the core activities undertaken. Separate communities have worked on e-health and on broader health policy and while improving the use of ICT does seem important to many working in the NHS there remains uncertainty about whether current spending on ICT is likely to prove a good use of resources (Medix 2004). In this chapter we examine the government's health policy strategy and the potential for ICT to help deliver the improvements that are its objective. In doing so we define e-health, identify many of the applications and services of which it consists and set these in the wider context of health policy and NHS strategy.

High quality, patient centred care

Following the pledges of increased spending on the NHS in the Budget of March 2000, the Government published the NHS Plan, a ten-year plan to reform the NHS. Setting out a vision of a health service fit for the twenty first century, the NHS Plan makes ambitious proposals for many aspects of health services but at its core is one concept, that of patient centred care.

The vision of this NHS Plan is to offer people fast and convenient care delivered to a consistently high standard. Services will be available when people require them tailored to their individual needs. (Department of Health 2000 p. 17)

The concept of patient centred care was being developed before the publication of the NHS Plan, has been much discussed since then, and our understanding of what it means for patients and for the NHS is now much clearer. The ippr has, in previous work, identified five characteristics of high quality patient centred care (Kendall & Lissauer 2003). These are:

- Safe and effective. Care that is intended to help patients should not harm them and interventions should be based on the latest evidence.
- Promoting health and wellbeing. Care should seek to prevent ill health and promote good health in addition to treating illness.
- Integrated and seamless. Holistic care must be based on peoples' social and emotional needs as well as their physical and medical ones and on a recognition that the individual's needs are linked to those of their family and community.
- Informing and empowering. Patients should be provided with high-quality information to enable those who wish to become equal partners in decisions about their care to do so.
- Timely and convenient. It is important to patients that services are delivered in a timely and convenient manner and this also contributes to delivering better outcomes.

We use these characteristics of patient centred care in this chapter to illustrate the relevance of services being developed under the umbrella of e-health to the wider modernisation of the NHS.

Technology and health

The ippr has argued previously that 'e-government' is simply government for the modern, digital age. Similarly the label 'e-health' refers simply to the use of digital technology to enable delivery of health-related services. As with e-government more broadly, e-health services are health services first, with the 'e' of secondary importance.

Use of new technology might greatly improve the processes of the health service but ICT is limited in what it can achieve. While the changes in working practices or structures brought about by technology might be huge, ICT is essentially about the transfer and storage of information to ensure that the right information is in the right place at the right time. The potential of ICT to improve health services is therefore linked intimately with the potential for better information to improve health services.

The poor use of information in the health sector and the potential benefits of using it better have been clearly recognised in government policy. Following the publication of the 1997 White Paper *The new NHS: modern . dependable* (Department of Health 1997) a new information strategy was devised for the Health Service. This strategy, *Information for Health* (IfH) (NHS Executive 1998), was published in September 1998 and has set the agenda for the use of ICT in the NHS for the subsequent five years.

While the approach taken towards implementation has changed considerably (as we discuss in chapter 2), IfH remains relevant today in two important respects. First, the analysis of the information requirements of patients, health professionals, health managers and the public set out in IfH has survived those five years intact and underlies all subsequent policies. And second, the range of applications and services deemed necessary to meet those needs remains little changed. *Building the Information Core*, published in 2001, took IfH and set out the ways in which it would help deliver the objectives of the NHS Plan. While the arguments used to support investment in ICT were tweaked, the applications and services being considered remained essentially the same. If current targets for the use of ICT are met, the NHS of 2008 will have a similar information infrastructure to that which was envisaged ten years previously.

We use the remainder of this chapter to overview possible improvements in the use of health related information, including those suggested in IfH. We highlight many of the applications

and services that would facilitate this and their relevance to the government's wider health strategy.

A greater role for patients

Patients being treated in the modern NHS will increasingly take more responsibility for decisions about their own care and as this happens there will be a concomitant increase in their need for information. More and better information will be needed to inform patients' choices about how, where and by whom they wish to be treated.

It seems likely that two factors will lead to greater patient involvement in decision making and to an increase in self-care.

First, patients themselves are likely to become increasingly keen to take on more responsibility for choices about their care. This sentiment can already be observed in relation to choices over where treatment occurs, with the public saying that they would prefer greater influence over this than they have currently (MORI 2003c). Positive experiences of the private sector, where individuals have become accustomed to flexible and individualised services may be partly responsible for this as might changing public attitudes such as a decline in deference (Duffy, Downing & Skinner 2003).

The government has responded to these findings and increasing patients' control over access to services is a crucial element of the ongoing reforms of the health service (Milburn 2001). Increasing the level of patient choice, together with introducing new funding arrangements, is seen as key in making the NHS more responsive to patient wishes (Department of Health 2003a).

NHS Trusts will in future be paid for the treatment episodes that they conduct rather than through block agreements (Department of Health 2002e). The government believes that this will lead to funding following the patient, making choice the driver of improved service provision. Specifically, increased choice is supposed to lead to incentives that will ensure the provision of services that more closely match patient preferences as well as improving efficiency and quality.

Changing public attitudes may also lead to a rise in the proportion of patients wanting to be more fully involved in more detailed decisions such as those on specific treatments or drugs. There is evidence that patients are reluctant to take on too much responsibility for their own care (Edwards 2001). However, dissatisfaction with paternalistic attitudes and evidence that day-to-day self-monitoring leads to better management of conditions is likely to lead to an increased desire to be more involved in decision making (Barlow et al 2000).

This increase will be reinforced by a second factor: Increasing levels of self-care could prove an effective way to relieve demand on the NHS. Around half of all illness episodes already pass without any professional involvement (Kendall 2001) but an increase in the prevalence of chronic conditions will mean that effective self-management is likely to become more important in the future (Kendal 2001). The Department of Health's Expert Patient Programme has been leading work to ensure that the NHS provides the type and level of support that is necessary if levels of self-care are to increase.

If patients become increasingly self-reliant, pressure on the NHS will be relieved in two ways. First, while self-care requires professional involvement if it is to be safe and effective, patients who become expert in the management of their own conditions will reduce the workload of the NHS. And second, increasing self-care may lead to a better public understanding of the appropriate use of the NHS. This should mean more effective use of scarce resources, reducing preventable illness and avoiding wasteful treatments and use of medicines (Fishwick & Letts 2002). Moving towards this more responsible and appropriate use of NHS services is a clear aim of the present government (Department of Health 2004c).

This scenario of informed, empowered patients taking greater responsibility for choice about their health and healthcare is a key element of the vision for the NHS being set out by the government. But the successful introduction of all these changes in patients' roles is dependent on the better availability to patients of reliable information.

A shift in the pattern of decision making in relation to treatment options away from a paternalistic model towards one of co-production of healthcare can only occur if patients have reliable sources of information. Provision of this information might be facilitated using new technology. While there are clearly issues around the reliability of information and equality of access (Rose 2003), the internet, digital television and mobile technologies could all play an important role in providing patients with information about their conditions. This, together with the details of previous and current treatment provided by a personal electronic health record would equip patients with the kind of information they would need to play a larger role in choices about their care.

In order for extra choice over where, when and by whom to be treated to deliver benefits, patients must have information about the quality of care in the NHS that has previously been difficult to access. Again this could be achieved using the internet or other digital means. This new information, together with more effective means of responding to patient preferences such as electronic appointment booking systems should give patients more control over their interactions with the NHS. Becoming more empowered would then enable

patients to choose treatment that was convenient for them and might also help to drive up the standard of care throughout the health service.

A healthier public

While delivering an effective NHS remains the top issue for government electorally (MORI 2003b), it is also important to make effective public health interventions in order to maintain health, reduce health inequalities and prevent illness. The public health function has a long history but its importance has become more widely recognised since the 1998 Independent Inquiry into Inequalities and Health (Acheson 1998). In particular, the health improvement element of public health has taken on a higher profile since the inquiry's report (Tennant & Woodhead 2002). This issue has been given extra impetus recently with the publication of Derek Wanless's most recent report (Wanless 2004) and the government is now seeking to spark a debate around the proper role of the state, the individual and other actors in attempting to ensure good public health (Department of Health 2004a). This debate is important given the opportunity that an improved public health system might present to both improve the nations' health and to reduce strain on the NHS (Wanless 2004).

In the context of this attempt to give citizens more information about how to remain healthy and avoid sickness, digital technology might be a powerful tool. The public sector might use different technology platforms to get relevant information to all citizens or to target health promotion information specifically at those most at risk. For example, interactive digital television might be used to provide more information in support of stop smoking advertisement campaigns to achieve the government's target of reducing the 120,000 deaths caused by smoking each year (Department of Health 1998).

The public as policymaker

The creation of Foundation Trusts typifies a move in health and throughout government to involve the public and local communities more closely and effectively in the development of policy. In addition to formalising patient and community involvement through the Boards of Governors of Foundation Trusts, the Department of Health has also recently replaced local Community Health Councils (CHCs) with a new system of public and patient involvement (Department of Health 2003g). It has been argued that the replacement of CHCs has been rushed and that policy on patient involvement in the health service has been confused (House of Commons Health Committee 2003). However, the establishment of Patient Advocacy and Liaison Services (PALS) and Patient and Public Involvement Forums (PPIFs) for every NHS trust and PCT does indicate an attempt to make policymaking and management of the health service more responsive to patient and public preferences. This sentiment can also be seen in the establishment of a Citizens' Council by the National Institute for Clinical Excellence (NICE) to ensure that public opinion can inform their guidance on treatments in the NHS (National Institute for Clinical Excellence 2002).

These developments are entirely appropriate given evidence that individuals are keen to be involved on issues of strategic national importance such as those around health (Clarke 2002). Effective public involvement could not only lead to more effective health services but may also have some positive outcomes in terms of civic and democratic renewal (Clarke 2002). However, this greater public involvement is only likely to add value if public opinion is well informed. So the provision of effective information on health policy and its impact, as well as the opportunity to become involved, is crucial (Clarke 2002). There is clearly a role for digital technology to play in giving the public access to this type of information whether through the web, interactive television or other platforms. Beyond this though, the telephone, the internet and other technologies allow information to flow back from the public to those responsible for formulating policy.

Previous ippr work has highlighted the potential of e-participation practices in local government and there is no reason why similar principles should not be applied in the area of health policy (Kearns, Bend & Stern, 2002). Rather, the geographically dispersed nature of the groups likely to be relevant (patients with a given condition, for example) may make internet technologies even more useful. ippr's public involvement awards have provided concrete examples of the positive impact of good public involvement work in health and of effective use of new technologies in public involvement (ippr 2002). Others have done much broader work on the potential of new technology to invigorate democracy (Coleman 2004) and this thinking, together with innovative projects happening on the ground show how ICT might help in the attempt to make patients and the public more involved in decision making around health care.

Helping professionals deliver

The modernisation of the Health Service will mean considerable reform of the NHS workforce. Attempts to improve the quality of care experienced by patients will require changes in the skills, structure and working practices of the health workforce (Kendall & Lissauer 2003). Several issues are worth highlighting.

First, as we discussed in the previous section, if healthcare is to become more informing and empowering, professionals' relationships with their patients will have to alter in the future. The possible benefits of greater patient involvement in decisions about their care will lead to a changed role for many in the NHS workforce. For these changes to be successful, professionals will clearly need good interpersonal skills to involve patients in decision making as well as the ability to effectively explain the potential benefits and risks of alternative courses of action.

It is not only relationships with patients that will have to change however. If the benefits of patient centred care are to be delivered, interactions between professionals and between different health related sectors will have to change considerably. For care to be delivered according to the needs of patients, rather than those of traditional professions, those in the NHS workforce will have to work in a more interdependent and inclusive manner than they have often done previously.

These changing roles will have implications in terms of the set of skills and types of training that will be required by the future NHS worker. The government is attempting to rationalise the fragmented nature of professional education and introduce a set of core skills as part of all pre-registration training (Department of Health 2001d). This change will lead to the development of a shared body of knowledge and could increase inter-professional understanding and facilitate closer working. New staffing structures proposed by the Future Healthcare Workforce Group are also being piloted and their impact on the delivery of patient centred care should be watched closely.

Non-professionally qualified staff play a significant role in patient care and are a group that, having been neglected in the past, now need particular attention in terms of training. More flexible and easily accessible courses are required if this part of the workforce is to fulfil its potential. Good access to training will also be important for all staff throughout the health service. The ideal situation has been described as a skills escalator with healthcare workers able to easily develop relevant skills in order to progress their careers (Department of Health 2001d; Kendall & Lissauer 2003).

Clinicians' skill in accessing and interpreting information on the likely consequences of health care will be put to the test in future. The amount that we know about health and disease is growing rapidly, making it difficult for even experts on specific conditions to keep in touch with all the relevant research being conducted. At the same time there is a move towards evidence based medicine (EBM): making decisions according to the evidence about which course of action is likely to be most beneficial. While this move to more effective use of evidence is desirable, it is also problematic at a time when the amount of evidence available is increasing so rapidly. In the future, health professionals will have to be expert in getting hold of and using evidence effectively.

All these challenges are faced in the context of continued capacity issues within the health service. There are considerable shortages of some types of staff in the NHS, with almost five percent of doctors' positions vacant for three months or more (Department of Health 2003n). Furthermore, there are considerable variations in the level of these shortages between different areas. An extreme example shows that some areas have no shortage of Accident &

Emergency consultants while in other areas one in five posts remains unfilled (Department of Health 2003c). These shortages are likely to have an adverse impact on the delivery of health services and variations in staffing shortages may also lead to geographical inequalities in outcomes for patients.

Changes will be needed throughout the health service in order to meet these various challenges effectively (Kendall & Lissauer 2003) and ICT may facilitate this process. In this context, we should be looking to see how improved use of technology might help health professionals to work more effectively and deliver more patient centred care. Several examples can be found where ICT may help to ameliorate the problems highlighted above.

We discussed in the previous section how access to health related information might help patients to play a more equal role in choices about their care. Electronically stored patient records could play a key role in this change. Allowing patients and professionals to have shared access to and control over details of patients' health and treatment might lead to greater shared decision making.

Electronic records should also make care more effective by allowing those treating patients to have a complete history of their condition and previous treatment. This information would be available to professionals throughout the NHS and this change might facilitate more integrated care. Enabling the sharing of information across the health-related workforce in a way that is comprehensible to everybody could help to overcome divides between professional groups and between the NHS and social care.

By allowing patient specific information to be seen by different professionals in different locations, ICT might enable professionals to deliver a service that is more convenient for the patient. For example it could allow patients to visit a different GP if they were away from home or get personalised advice on their condition from a nurse via telephone. This greater flexibility might also help to solve staff shortage problems in certain areas by allowing patients to travel for quicker treatment more easily.

This problem might also be reduced without it being necessary for patients to travel through the use of telemedicine: the use of appropriate technology to deliver health services and support remotely. Use of ICT, to allow remote consultations or transfer of images or test results for diagnosis, could help to provide services that are more convenient for patients and also help the NHS use skilled staff more efficiently (Wyatt 2002). Use of telecare could also reduce strain on the NHS by allowing professionals to help people monitor their own health at home and to intervene at an early stage in order to prevent the need for more expensive care at a later stage.

Technology should also help to overcome the growing mismatch between the vast amount that we now know about health and medicine and the limited capacity of the human mind to retain and recall that knowledge. Decision support systems, libraries of decision protocols or summaries of available evidence on a given condition or intervention can be made available to professionals electronically. This should allow evidence-based principles to be adhered to, helping to ensure safe and effective treatment based on the most recent information available.

Also, digital technology could also facilitate the continual development of staff skills that is key to the delivery of the NHS Plan (Department of Health 2002a). Using the internet to deliver training remotely would allow health professionals to complete that training wherever was convenient, perhaps in their workplace or home. Making training more accessible should then lead to a more effective workforce, better able to deliver care to patients.

Managing the NHS

With public finances under pressure, it is important that every pound spent on the NHS delivers maximum value. This is particularly the case given the political gamble that the government has taken by rapidly increasing health spending in recent years. If spending on health is to lead to maximum improvements in health good access to management information will be essential.

Efficient allocation of resources within the Health Service requires knowledge of the costs and the benefits of different types of intervention so that each pound can be committed to the treatment with the greatest marginal benefit (Barr 1998). While this information may be very difficult to obtain, because benefits are hard to measure and causality may be confused, information about treatments given and their effects on patients is crucial if resources are to be used most effectively.

More accurate information about the incidence of disease could help to direct resources in the short term and could also deliver benefits in the long term. A more detailed picture of patterns of health and disease could help policymakers to develop more effective public health strategies, leading to better health outcomes and savings to the NHS.

Improved non-clinical management information might also lead to savings for the health service. Improving procurement practices has been identified across the public sector as a possible source of cost saving and is a priority area of the Efficiency Review being led by Sir Peter Gershon (Cabinet Office 2003). A new commercial directorate has been created within the Department of health to ensure that procurement within the NHS becomes more efficient

(Benjamin 2004). With the NHS purchasing around £11bn worth of goods and services each year, improved information that led to even small improvements in efficiency could deliver considerable savings.

Improving use of ICT could help to deliver much of this information much more easily than was previously possible. The effective use of electronic health records could allow the extraction of anonymised data on health care and health. This should lead to more effective management of resources and would also facilitate medical research and effective public health planning while not necessitating the transfer of resources into data collection. Electronic appointment booking and electronic prescriptions systems would provide better data on staff activity and on drug use. Wider use of e-procurement within the NHS could also lead to considerable savings.

Delivering value through ICT

In all the areas above it seems clear that better use of information could help the Health Service operate more effectively. Beyond this, ongoing changes such as increasing patient choice and the desire for more convenient delivery of services highlight the importance of having the right information in the right place at the right time. This makes e-health a crucial element of the government's programme of reform in the NHS and justifies moves to prevent the poor information practices of the past impeding our progress towards a more modern NHS.

In the following two chapters we look at the government's efforts to realise the potential of ICT. In chapter two we overview the government's ICT strategy for the NHS and examine the range of activity undertaken to fulfil the health service's information requirements. And in chapter three we go on to explore whether these new services are delivering the benefits that they are intended to.

Chapter 2: e-Health policy and practice since 1997

Since coming to power in 1997, the Labour Government's determination to improve the NHS has been matched, at least on paper, by its determination to use ICT in delivering that ambition. In this chapter we trace the progress of the Government's strategy for using information technology in the NHS from the optimistic enthusiasm of the 1997 health White Paper to the spending boost and focus on delivery of the National Programme for IT in the NHS.

In the first section of the chapter we take a broad overview of the development of policy in this area, examining the Government's approach to reforming the NHS and the extent to which its priorities have or have not been linked clearly to the strategy for the use of ICT. We also look at the changing approach to implementation of the ICT strategy; increasing centralisation as increased devolution of decision making power became the norm in health and in other policy areas.

In the second section we look at some of the specific services and applications that are being introduced into the NHS. While the broader strategy has changed considerably since 1997, the range of services being proposed has remained very similar. We look at six specific services and the progress that has been made towards delivering them.

ICT policy developments in health 1997-2004

The 1997 White Paper and Information for Health

Given the electoral importance of health care (MORI 1997) and the significant concerns about the effects of the internal market put in place by the Conservative Government, it is unsurprising that the Labour Government elected in 1997 took swift action to reform the NHS. In December 1997, the new Government published its first health White Paper *The new NHS: modern . dependable* (Department of Health 1997). The paper was primarily intended to set out the way in which the internal market would be replaced with a new system, labelled 'integrated care', but the strategy gave a prominent role to the more effective use of information technology in the delivery of health services. So strong was the emphasis on ICT that two of the four key themes set out in the introductory chapter were focussed on it. Along with shifting resources from red tape to care and fast-tracking cancer services, the paper committed the Government to introducing a new nurse-led telephone helpline NHS Direct and to link more organisations to the NHS's network NHSnet.

The previous ICT strategy for the NHS was criticised for having been too focussed on supporting the processes of the internal market. The 1997 White Paper promised that a new

ICT strategy would be published in 1998 in order to ‘harness the enormous potential benefits of ICT to support the drive for quality and efficiency in the NHS’ (Department of Health 1997 s. 3.15) and highlighted a few examples of the services that might deliver these benefits.

This strategy was set out in the document *Information for Health* (IfH) in September 1998 and informs the e-health agenda in the NHS to the present day. Subsequent events have meant considerable changes in the way new ICT systems will be delivered in the health service and this is an issue to which we return later in this chapter. However, as we mentioned in chapter one, IfH remains influential thanks to its analysis of the information needs of patients, health professionals, health managers and the public and its identification of the types of services that might be necessary to meet those needs. As Frank Burns, primary author of IfH, sets out in the document’s first chapter:

An information strategy for the NHS must be driven primarily by a careful and comprehensive analysis of the information needed to support the service objectives of the NHS and the policy objectives of Government... not simply by the technical possibilities. (NHS Executive 1998 p. 13)

The programme of service development set out in IfH is derived from this analysis. Using an approach similar to that which we took in chapter one, the information needs of specific groups are identified. These needs inform a set of strategic information objectives which in turn are then used to determine which ICT services or applications will be provided. For example, the perceived information needs of the public are summarised in the strategic information objective:

To provide fast, convenient access for the public to accredited multimedia advice on lifestyle and health, and information to support public involvement in, and understanding of, local and national health service policy development. (NHS Executive 1998 p. 19)

The benefits that are anticipated should this objective be met are set out clearly (NHS Executive 1998 p. 79):

- A public with more autonomy, choice and control over their lives.
- More effective and appropriate use of services.
- A healthier population, and individuals better able to look after themselves.
- Increases in the NHS’s accountability and the level of public involvement in the NHS.

Having established the information objective and having linked it closely to the desired outcomes, the authors of IfH go on to develop a portfolio of applications and services that

they believe will help to achieve these aims. In the case of the objective above, they outline several technology-enabled services:

- The NHS Direct telephone enquiry service.
- A possible gateway to health information on the Internet.
- The development of a National Electronic Library for Health that could collate and disseminate information for patients as well as for NHS staff.

In this way, IfH sets out the rationale for the uses of ICT that it advocates in a systematic and plausible manner. In every case, a given application or service is linked clearly to an information objective, which is then itself justified in terms of the impact that achieving it would have on health and healthcare. While the link between application of ICT and enhanced outcomes is simply asserted, rather than derived from examination of evidence on existing projects, this is not surprising given the then novelty of many of the proposed projects.

While the analysis of information need set out in IfH has survived to the present, the mechanism by which the new systems and services were to be delivered has not. IfH emerged from a year-long review of the approach that had been taken to the use of ICT in health and the role of the NHS's Information Management Group (IMG). Having established the information needs of the NHS, IfH acknowledged the many obstacles that had hindered successful implementation of previous strategies and set out new organisations and partnerships designed to overcome them. Among the structural changes were the disbandment of the IMG and the establishment of an Information Policy Unit (IPU) for the NHS and a new Special Health Authority, the NHS Information Authority (NHSIA), to deliver ICT products and services for the NHS. Despite these structural changes however, the implementation strategy outlined in IfH would later be found to have been inadequate.

The NHS Plan, ICT and patient centred care

The NHS Plan (Department of Health 2000c) can be seen as the Government's first comprehensive attempt to reshape the NHS around the needs of the patient and as we argue in chapter one, more effective use of ICT has the potential to contribute to realising this goal. It is unsurprising then that ICT was painted as a crucial part of the picture. The foreword to *Building the Information Core – Delivering the NHS Plan* (BtIC), published six months after the Plan itself, makes this clear:

For too long the NHS has thought of ICT projects in isolation. Something to be left to the ICT specialists. Something that is not a priority for patient care and health services.

Let us set this right. The better capture, management and use of information – analysed, communicated and shared through modern systems and networks – is central to managing change and modernising the front-line delivery of care, treatment and services to patients. It is

central to improving the day to day working and skills of staff. It is about improving the very nature of care itself – information, communication and understanding. (Department of Health 2001a p. 3)

This conception of ICT as central to the core activities of the health service is reflected in the structure of BtIC. The planned uses and possible benefits of information technologies are set out in sections which correspond to each area of care highlighted in the NHS Plan itself. For example, the Plan sets out the vision for intermediate care, to improve patients' transitions between hospital and home. BtIC then highlights the impact that Electronic Health Records (EHRs) and telecare might have in this area, allowing those working in both health and social care to have access to patients records and enabling carers to monitor patients in their own homes.

On the one hand then, BtIC provides a strong narrative about the capacity of ICT to help achieve key targets for the health service. At the same time however, the key objectives and approach remained as they were set out in IfH (Department of Health 2001a p. 8). The ease with which the NHS's information strategy was reshaped to fit the new drive for more patient centred care highlights the prescience of Information for Health's authors in determining the applications and services that would be required in a modern NHS. While they identified the ICT that would be needed to support patient centred care however, their approach to implementation and funding would soon be determined to have been lacking.

Wanless and the National Programme for IT

A pivotal moment in the recent history of ICT in the NHS was the publication of the Wanless Report in April 2002 (Wanless 2002). Wanless' remit was to assess the resources necessary, 'to ensure the NHS can provide a publicly funded, comprehensive, high quality service available on the basis of clinical need and not ability to pay' (Wanless 2002 p. 2). In order to do this he used a series of different scenarios, examining the effect of exogenous factors on the funding requirements of the NHS. In all these future scenarios, however, more effective use of ICT would be crucial to delivery of a high quality service.

Wanless was scathing about the past performance of the NHS with relation to information technology. He highlighted the historically low levels of spending on ICT in the health sector, around one and a half per cent of total health spending in the UK compared to six per cent in the US (Wanless 2001 p. 166). Even where money had been spent on ICT, he describes the implementation of new systems as piecemeal and poorly integrated across and between organisations. Wanless believed that this problem needs to be rectified and his vision for the health service in 2022 is one where:

- EHRs, electronic appointment booking and prescriptions are part of an integrated ICT system enabling a more joined up service across the NHS and social care;
- High quality care can be delivered using up-to-date and effective technology and in a variety of convenient settings using, for example telemedicine including NHS Direct;
- Patients are armed with more, better information enabling them to take a larger role in choices about their care and their health; and
- People can take greater responsibility for their own health and well being with the support of information available through iDTV or the Internet. (Wanless 2002 pp. 15-16)

Wanless' need to quantify the benefits likely to arise from increased investment meant that he examined the available evidence on the impact of ICT in health. Rather than attempting to isolate the benefits of ICT alone, the methodology used looks to capture the benefits within a wider productivity assumption based on the suggestion that the NHS should match productivity in the wider service sector. The report does, however, draw on research conducted in the US (Raymond & Dold 2002) to suggest that benefits could be seen both through reduced costs and improved services. For example, increased use of ICT might lead to reductions in charting errors, reduced length of stay and time savings. It is unfortunate that Wanless could not draw on evidence from within the NHS given the more than £2m committed four years earlier to research intended to support IfH (NHS Executive 1998 p. 95). This paucity of evidence is an issue to which we return in later chapters.

In order to deliver these anticipated benefits, Wanless called for a step change in the health service's approach to ICT issues. Specifically, two historically important barriers to the successful use of ICT in the NHS were highlighted.

First, in spite of the assertion made in IfH that, 'the NHS cannot afford not to make the investments necessary to deliver this strategy' (NHS Executive 1998 p. 107), Wanless identified funding problems as a key reason for the poor use of ICT in the health service. Funding for the programme set out in IfH came from two sources. First, those funds already being spent on soon to be redundant systems and savings made at the local level by improving then existing processes using the new systems. Second, additional funding from the Modernisation Fund set up for the NHS at the time of the Comprehensive Spending Review in 1998. Wanless highlighted the local allocation of resources and a tendency to divert these to deal with short term pressures unrelated to ICT as obstacles to successful ICT use in health. To resolve these problems he suggested a more nationally led approach, ringfencing of funding and a doubling of spending on ICT in order to meet the targets set out in BtIC.

Second, Wanless argued that a national approach to funding should be accompanied by a similarly centralised approach to standard setting. Although Information for Health had highlighted the need for national products and standards almost four years earlier, Wanless believed that this process remained inadequate and that this problem was leading to the development of a variety of incompatible systems throughout the NHS.

The government's response to Wanless' criticisms was to follow up a continued clear commitment to improving ICT use in *Delivering the NHS Plan* (Department of Health 2002a) with the publication of *Delivering 21st Century ICT Support for the NHS* (Department of Health 2002b) in June 2002. This document made clear that the principles that lay behind IfH remained valid but signalled a clear change in the approach that would be taken to key ICT projects.

Under the new arrangements there would be far greater central control of key ICT projects. A ministerial taskforce on ICT was established and the Director of Research, Analysis and Information at the Department of Health took overall responsibility for the modernisation of NHS ICT. A key element of this increased central control was the appointment of a Director General for NHS ICT, the UK's highest paid civil servant, to manage the new National Programme for IT in the NHS (NPfIT). This Director General would work directly with the Department of Health Information Policy Unit, the NHS Information Authority and Strategic Health Authorities and would be responsible for managing central funding for the programme.

Central funding for the programme was set at £2.3bn over three years in Spending Review 2002 and a nationally led approach was established through which NPfIT would procure three national services: a system of electronic health records, the capacity to book appointments electronically, and a system to transfer prescription information electronically (Department of Health 2003f). We cover the development of these services, both before and after they came under the control of the NPfIT, below.

While the National Programme has been the subject of most attention in recent months, there remains a large amount of ICT related activity occurring in the NHS with which it is not involved. For example there exist EHR systems that were developed locally in response to IfH, examples of telemedicine being pioneered on a small scale by local enthusiasts and there are also national, large scale projects that remain separate from NPfIT. As well as looking at the three national services being provided through the National Programme, in the remainder of this chapter we also examine three other services being made available nationally: the National electronic Library for Health (NeLH), the provision of health related information using the World Wide Web through the NHS Direct Online portal and provision of such information via interactive Digital Television (iDTV).

ICT applications and services for the NHS: Practice

Electronic records

Information for Health put the development of electronic records at the heart of the attempt to modernise the use of ICT in the NHS and they remain a key element of the current National Programme. Currently, patient's health information is often fragmented and stored differently in different organisations across the health service. In some places patients' histories remain recorded on paper and while in others the information may be held electronically, often the systems used for this are not capable of sharing that data with electronic systems used elsewhere.

The proposed solution to this problem was the development of a system of electronic health records. The potential benefits of this joined up system when compared to an assortment of fragmented paper or partially computerised records should be:

- Greater convenience and confidence as patients no longer have to give personal information more than once and know that whoever is treating them can see their relevant medical history.
- Better integration of care as different individuals and organisations within the NHS are able to share information more easily.
- Improved outcomes as healthcare professionals have better access to patient specific information and to relevant evidence upon which to base decisions.
- Greater efficiency as less time is spent collecting and using information. (NHS Executive 1998 p. 24)

In April 2000 the Electronic Record Development and Implementation Programme (ERDIP) was launched to 'provide the opportunity for in-service development and demonstration of best practice and progress towards shared Electronic Health Records' (NHSIA, 2003a). By the time it concluded in 2003, nineteen projects had been run exploring different elements of electronic records.

One of these projects, in South West London was intended to enable the sharing of patient records between the local NHS Direct site and over thirty GP practices in Merton, Sutton & Wandsworth. The transfer of information over NHSnet using email allowed the nurses working at the NHS Direct to transfer details taken from patients using the NHS Direct telephone service to the patients' GPs and GP surgeries to send information to the NHS Direct centre. The system enabled NHS Direct to act as an out of hours (OOH) service for GP surgeries.



Providing access to patient information outside office hours was also the aim of the pilot project in Bradford. A central repository for summary electronic records was developed in order that patient information could be made available to OOH services, to the accident and emergency departments of local Trusts and to ambulance services.

The ERDIP project in Walsall was designed to support pan-community working around National Service Frameworks (NSFs) for stroke, diabetes, Coronary Heart Disease (CHD) rehabilitation and heart failure. The project developed a database that enables patient records in hospital, GP and social care systems to be linked using the patient's NHS number as an identifier.

In order to examine issues around patient access to electronic records, one hundred and fifty patients registered at a single-handed GP practice in Hadfield were given their medical records electronically using a floppy disk. The details of the record allowed patients to see details such as dates of treatments, medications and correspondence to and from the GP. Patient attitudes to electronic records were further explored by the ERDIP project in Bury & Knowle where over four hundred patients responded to a questionnaire on that topic.

These and the remainder of the pilot projects that made up the programme have been independently evaluated, in many cases more than once. Individual pilot organisations conducted or commissioned evaluations themselves at a local level. In addition an evaluation of sixteen of the pilot sites was commissioned centrally by the NHSIA and conducted by PA Consulting. This central evaluation produced two reports for each of the pilot projects and one final synoptic report, bringing together the evidence gathered across all of the sixteen sites which was published in January 2003. We examine many of these evaluations and their findings in later chapters.

As with the development of e-booking and e-prescriptions services (which we discuss below) the creation of the NPfIT has had a considerable impact on the development of electronic records. Rather than NHS organisations having considerable autonomy in determining their approach to electronic records, through NPfIT provision will now be controlled much more tightly from the centre. Two different types of contracts have been awarded to commercial organisations in order to deliver the NHS Care Record Service (NHS CRS)¹.

A consortium headed by BT has been awarded a contract to act as National Application Service Provider (NASP) (Department of Health 2003h) and is responsible for delivering particular services that would be common to all users across England (for details of contracts

¹ Previously the Integrated Care Record Service (ICRS)

signed through NPfIT, see Appendix A). In the case of NHS CRS, those services include systems for passing messages securely between different, mechanisms for authenticating approved users and a national patient record database.

In addition, a wide range of services will be provided in each of the five clusters of English Strategic Health Authorities by a Local Service Provider (LSP).² LSPs are responsible for replacing and integrating local ICT systems to support the delivery of national services and also provide staff training and business re-engineering support services within their cluster. LSP contracts for the five regions worth almost £5bn were awarded between December 2003 and January 2004 (Department of Health 2003h; Department of Health 2003j; Department of Health 2003k). As well as delivering NHS CRS locally, LSPs will implement the electronic booking of appointments and the electronic transmission of prescriptions.

Electronic transmission of prescription information

Given the amount of paper that moves through the health service in order that prescriptions can be written, processed and fulfilled, it is unsurprising that this has been seen by government as an area where use of ICT might deliver a quick win.

Current prescription processes are considerably more laborious than those which might be delivered by an effective electronic prescriptions service. At present most prescriptions are printed in GP practices, signed by the GP and then given to the patient. The patient then presents the prescription at a pharmacy where the relevant information is manually entered onto the pharmacy's computer system. Further details about the exact nature of the medicine prescribed and prescription charges paid are added to the prescription by the patient and by the pharmacist and the patient then walks away with their medicine. Every month the pharmacy then sends all dispensed prescriptions to the NHS Prescription Pricing Authority (PPA), the organisation responsible for making payments to pharmacies and GPs and for producing information about prescriptions made throughout the health service. At the PPA the prescription information is then manually entered into the Authority's own computer system in order to enable payments to be made and management information to be given back to other NHS bodies (Sugden 2003a).

With this largely paper-based process happening over fifty million times each month (Prescription Pricing Agency 2003), it seems likely that there might be considerable savings, as well as other benefits, delivered by automating the system. The government recognised this potential when setting out its vision of *Pharmacy in the Future* (NHS 2000). This

² The five clusters of StHAs are North East, North West & Midlands, Eastern, Southern and London.

document, which set out the role of pharmacy in delivering the NHS plan, invited ICT companies to propose pilots to trial the electronic transfer of prescription information (ETP) in primary care. Three six month pilots were run by the consortia TransScript, Pharmacy2U and Flexiscript in 2001/2002 (Sugden 2003a).

In the event, however, the pilots did not run smoothly. A summary evaluation report (Sugden 2003a) highlights the fact that the pilots themselves and therefore their evaluation had been subject to delays in both patient recruitment and technical implementation. These delays meant that the projects were not comprehensively evaluated leaving it unclear whether the potential benefits of using ICT more effectively in the prescriptions process would be delivered in practice. Rather, the evaluation team was able only to repeat some of the theoretically possible benefits that the Department of Health had hoped might be delivered by the pilots.

At the same time as delays were hampering the evaluation of the pilots, there was some confusion and controversy over the future of the systems that had been developed by the pilot projects. When the NPfIT was launched in June 2002 it appeared as if the pilot projects would grow and that there would be a seamless move towards a national rollout of electronic prescriptions services (Department of Health 2002b). However, in spite of a six month extension to the projects to June 2003, this has not happened. The Flexiscript consortium chose to suspend operation of their pilot in April 2003, Pharmacy2U followed suit in June. Transscript continued to operate beyond the period of the pilots but announced that it was to close at the end of 2003.

From the official closure of the pilots in June 2003 there existed some uncertainty regarding the relationship between ETP and the NPfIT for two months until the publication of the revised specification for the then Integrated Care Record Service in September. ETP was then added to the 'data spine' which is to be delivered by BT as winner of the NHS CRS National Application Service Provider (NASP) contract. The government currently hopes to achieve fifty per cent implementation of the e-prescriptions service by 2005 with full roll out in 2006/7.

Booking appointments electronically

The ability to book appointments electronically will be crucial if the government is to be successful in its attempt to increase the level of choice that is given to NHS patients over when, where and by whom they are treated.

Currently doctors wanting to refer patients write to a hospital (often to a specific consultant) requesting an appointment. At the hospital to which the letter has been sent, a decision is made about whether that consultant or another would be the most appropriate to see the



patient concerned. Once that decision is made, a slot when the consultant is available is chosen and a letter with the details of that appointment is sent to the patient. If the appointment is not appropriate then the patient then has to ring the hospital or go back to their doctor in order to try and alter it (Department of Health 2002c). This system is a long way from fulfilling the government's ambition of giving patients greater choice and making the NHS more responsive.

An electronic system might allow a variety of appointments to be booked in different circumstances. The system of referral from primary to secondary care outlined above should be improved considerably. In the future, patients should be able to choose an appointment that is convenient for them from their GP's surgery or from home by telephone or using the internet. Other types of appointment booking might also be improved with patients able to book appointments with their GPs, other primary care services or follow-up appointments using the internet or by telephone.

The National Booking Programme Electronic Systems Implementation Project was set up in Autumn 2001 in order to trial systems that would enable the booking of secondary care appointments at GP surgeries. Five geographical 'enterprise communities' were selected to take part in the first stage of the project for twelve months from April 2002. Fourteen more communities were chosen to begin introducing e-booking from November 2002. A team from the Yorkshire Institute of Clinical and Health was commissioned to conduct an evaluation of the project. They produced a brief initial report in November 2002 (Heathfield et al 2002), highlighting some of the achievements and problems of the five enterprise communities and scheduling the publication of the final report for March 2003. However, the publication of the final evaluation report was delayed and was not yet in the public domain at the time of writing.

As was the case with the delivery of e-prescriptions, the e-booking project was affected significantly by the launch of the NPfIT. The e-booking project was initially being run by the NHS Modernisation Agency as part of the National Booking Programme but e-booking has now become one of the services that will be delivered through the NPfIT. The NASP contract to provide the e-booking service across England was awarded to Atos Origin (then Schlumberger Sema) through the NPfIT in October 2003, an event hailed by the Department of Health as a step towards a more responsive, patient centred health service (Department of Health 2003m). The first bookings are expected to be made through this system in summer 2004 with the service available to all GPs by the end of 2005 (NHS 2004a).

National Electronic Library for Health (NeLH)

As with many of the services that we discuss in this chapter, the rationale for a National electronic Library for Health was set out clearly in IfH. It was thought that the advent of the



World Wide Web would provide a user-friendly tool with which to accommodate the twin pressures of an ever increasing amount of medical knowledge and the need to make interventions on the basis of the best evidence available. The online library would draw together relevant knowledge and knowhow and would make it available to NHS staff free of charge and in an easily accessible format.

A pilot version of the site (www.nelh.nhs.uk) was launched in November 2000 and evaluations of the service were conducted by the University of Aberystwyth (Urquhart et al 2001) and by consultancy NCC (McTaggart 2001) during the summer of 2001. The procurement of the full NeLH occurred in 2002/3 (NHSIA 2001b) and the site is now operational.

Information available via the website falls into four broad categories. First, knowhow is available to users to assist them with decision making. Resources including guidelines from the National Institute for Clinical Excellence (NICE) and decision support systems such as Prodigy are available via the NeLH front page. A database of care pathways that are in use or development throughout the NHS also aims to prevent continual reinvention of the wheel by those who are attempting to develop care pathways in order to encourage evidence based and patient centred care. Second, NeLH also provides access to research on the effects of different types of intervention. The knowledge section of the website includes collections of evidence including the Cochrane Library of systematic reviews of evidence and access to the website of the journal *Bandolier*, which aims to contribute to evidence based medicine. Third, NeLH provides resources through specialist libraries and communities organised by profession and also by topic. For example, there are resources on topics such as diabetes, emergency care and health informatics. Finally, there are more rapidly changing sections of the website which focus on information that is new or particularly relevant at a given time. These include a document of the week and a 'hitting the headlines' section which provides the evidence behind health related stories that appear in the press, providing a useful resource for busy professionals who may be asked about such issues by patients.

The future strategy for NeLH (NHSIA 2003b) commits it to continuing to 'promote evidence-based decision making for patients, clinicians, managers and commissioners by the organisation and mobilisation of best current knowledge'.

NHS Direct Online

As we highlighted in chapter one, the provision of high quality health-related information and advice to patients and the public is an important element of the government's attempts to make more effective public health interventions and to encourage appropriate use of NHS services. It was for this reason that a new telephone helpline to provide health information was announced in the 1997 health white paper (Department of Health 1997) and pilots of that



service, NHS Direct began three months later (NHS 2001). In addition to this telephone helpline, an online service offering information and advice was launched in 1999, branded as NHS Direct Online. The new NHS Direct Online service was provided by Hampshire Ambulance Service NHS Trust, then also one of 22 host organisations for the telephone based service. However, there was also a central management team at DH that set policy and monitored performance and responsibility for the service has been further centralised since, as we discuss below.

The site is accessible nationally at www.nhsdirect.nhs.uk and provides three types of information. First there is a large amount of health related information on the site that is available to users. This can be accessed by using the self-help guide which allows visitors to the site to get health advice by answering a series of questions. Alternatively visitors can access a health encyclopaedia which provides information covering illnesses, conditions and treatments. Second, information on local NHS services can be accessed using a database. Users can also use the site to find the details of their nearest GP surgery, dentist, hospital, pharmacist or other NHS organisation by entering their postcode. Finally, since 2001 there has been an online enquiry service to provide people with information about existing conditions that they have been unable to find on the website. Questions submitted are dealt with by health information researchers and the target is to provide a response within five days. The website now deals with half a million visitor sessions each month (Department of Health 2003d).

In early 2003 the Department of Health published a strategy document setting out future plans for NHS Direct, including for the online service (Department of Health 2003d). While the tone was largely positive, some significant changes were recommended, most notably that all NHS Direct services should be delivered by one national provider. The NHS Direct Special Health Authority took over responsibility for delivery of NHS Direct services on April 1st 2004 and it seems likely that the next few years will see developments of the online service under its guidance. At the same time, these types of services provided by NHS Direct Online will also be delivered via other channels, including through digital television.

interactive Digital Television

Providing health related information via the World Wide Web is an imperfect solution in that unequal access to technology in society inevitably limits the number of people that the information will reach. With under half of UK households having access to the internet at home and this proportion dropping to fewer than one in eight among the poorest tenth of society (ONS 2003), health information provided online may not reach those who need it most. The fact that those in lower income groups more often have digital television (DTV) than the internet in their homes makes greater use of DTV in the delivery of government

information and services a potential way to ameliorate the effects of the digital divide. The government recognises this potential benefit and other advantages of DTV use such as the familiarity of television in the broader e-government context (Office of the e-Envoy 2003).

It is unsurprising then, with its commitment to reducing inequalities in health outcomes (HM Treasury 2002a) and a desire to improve public health and reduce strain on the health service, that the Department of Health should be interested in using digital television to provide health related information to people in their own homes. This interest manifested itself in May 2000 when funding of £5m was announced to fund a series of pilots using DTV to provide health information and advice (Department of Health 2000b), an announcement that led to the running of four pilots during 2001.

The Living Health pilot was delivered using Telewest's cable TV service in Birmingham and made available content provided by NHS Direct Online on health topics including information on illnesses and treatments as well as on local health services. The Department of Health also used the service to provide information about careers in the NHS. As well as providing information, the Living Health pilot provided some transactional services for users. The service allowed for short online consultations to be held where an NHS Direct nurse could be seen live on the patient's TV screen enabling them to show the patient graphics or short videos. An online appointment booking service was also trialled that enabled cable TV users to book appointments with three GP surgeries within the trial area.

A second pilot delivered over a broadband telephone network by Kingston Interactive Television (KIT) in Hull offered three different sections of content. A large part of the content was based on NHS Direct Online and was branded as NHS Direct Digital. There was a second section giving information on various conditions with the content from NHS Direct Online and elsewhere. And third, the pilot delivered information on healthy living including diet, drinking and smoking. In addition to this information, an interactive online medical record keeping service was also provided that enabled users to store limited medical records online.

Two further pilots were held; one delivering additional information to complement a series providing health advice for expectant and new mothers and another which was intended to deliver health related information and provide access to services in East London. All four pilots' impact and the approaches taken by the different selected consortia were evaluated by a team of researchers from City University and the University of Sheffield. We draw on the final report of this evaluation (Nicholas et al. 2002) when setting out in chapter three the benefits that have been delivered through use of ICT.

One year later it was announced that MMTV Limited had been awarded a contract to deliver nationwide a service branded as NHS Direct Digital TV (Department of Health 2003i). This £15m investment will deliver information on NHS services, on illness and treatment, on healthy living and on topical health issues. Roll out of the service is expected to begin in summer 2004.

Conclusion

As the details of e-health policy and practice since 1997 that are set out in this chapter make clear, there has been no reluctance in recent years to use ICT in attempting to improve health and healthcare. Rather, there has been considerable enthusiasm over the ability of new technology to meet the information needs that we set out in chapter one. This enthusiasm has led to the development of a variety of ICT related products and services including the six that we set out above. And the political importance of the successful delivery of several of these projects has been highlighted by their inclusion in a high profile, centrally controlled and well funded National Programme for IT.

The six products and services that we have outlined in this chapter do not even nearly comprise all use of ICT in the health service. A considerable number of innovative and potentially useful projects, for example in the area of telemedicine³, are occurring at a local level. However, the services set out above are the most high-profile ICT projects being run within the NHS. Therefore, in order to uncover the benefits that might be delivered through the use of ICT in health in the near future we have examined the evaluations of these projects. In chapter three we present our assessment of the level of public value demonstrably added so far.

³ For examples visit Telemedicine and e-Health Information Service <http://www.teis.nhs.uk/>

Chapter 3: The public value of ICT

It seems clear that the *potential* benefits of the use of ICT in the area of health are great. In the opening chapter we identified numerous ways in which better use of information might help to improve health services and health itself. The government recognises information technology has historically not been used well in the health sector and in chapter two we examined the government's efforts to remedy this (Department of Health 2002b). Specifically we examined six areas where new products or services were being developed to meet the information needs of citizens and the NHS. We use this chapter to examine to what extent those projects have been successful.

In defining success we have used the concept of public value and in the early part of the chapter we introduce that concept. We have used the public value framework as a tool to filter the existing evaluations of e-health activity (a full list of the evaluations that we examined is given in Table 1 below) and in the remainder of this chapter we present all the robust evidence of added public value that we have found.

Table 1: Project evaluations examined

Project examined	References of evaluation reports studied
National Booking Programme Electronic Systems Implementation Project	Heathfield et al. (2002)
Electronic Transmission of Prescriptions (ETP) Pilot Project	Brady et al. (2003) Sugden (2003a) Sugden (ed.) (2003b) Sugden (ed.) (2003c)

The Electronic Record Development and Implementation Programme (ERDIP)	Clamp, Felton & Heathfield (2001) Cowell et al. (2002) Cowell, Keen & Heathfield (2002) Felton, Clamp & Heathfield (2003) Foord & Owens (2002d) Foord et al. (2003) Foord, Mathisen & Owens (2002a) Foord, Mathisen & Owens (2002b) Foord, Mathisen & Owens, (2002c) Foord, Owens & Kolind (2002) Harris & Boaden (2003) Health Systems Consultants (2002) Heathfield, Clamp & Felton (2001) Kolind & Owens (2002) Mathisen & Kolind (2002) Mathisen & Owens (2003a) Mathisen & Owens (2003b) Munir & Boaden (2001) Obeney (2002) Owens & Foord (2002) Owens (2002) Owens, Mathisen & Foord (2002a) Owens, Mathisen & Foord (2002b) Owens, Mathisen & Foord (2002c) Parry (2001) Pyper et al. (2001) Pyper et al. (2002) Secta Singleton (2002) Smith & Gowing (2003)
interactive Digital Television (iDTV) pilot projects	Nicholas et al. (2002)
National electronic Library for Health (NeLH)	McNicol & Nankivell (2002) McTaggart (2001) Urquhart et al. (2001) Urquhart et al. (2002)
NHS Direct Online	CHI (2003a) CHI (2003b) NAO (2002)

Public value

In the past the impact of government actions has often been examined using criteria developed in the private sector. But while the ultimate goal for firms is always to deliver returns to shareholders, the challenges faced by public sector organisations are more complex. Therefore we need more complex methods by which to evaluate them (Kelly &

Muers 2002). As an analytical framework referring to the value created for citizens by government, public value can be used to aid decision making, to assess performance and, in relation to ICT, to provide a bridge between the technology and wider health policy communities.

Public value can be seen as being created in one of three areas (Kearns 2004):

- The cost effective provision of high quality services
- The achievement of desirable outcomes
- High levels of trust between citizens and government

Consequently, in this chapter we present the evidence gathered under these three headings.

Services

Public value is derived from improved services. This does mean services that are delivered more efficiently and effectively but perception of services is also important, with high levels of satisfaction with services creating additional public value. Satisfaction with a service might be increased by delivering shorter waiting times, better relationships between the citizen and the provider of a service or by increasing the fairness of the provision of that service.

The Department of Health's Public Service Agreement (PSA) makes clear the Government's commitment to improving health services, setting out several ways in which service standards are expected to rise. For example, waiting times for treatment should be reduced and patients should be given more choice over when and where they are treated. Accountability of the NHS to patients and the public should be increased and patients' experiences of treatments should be improved (HM Treasury 2002a).

While there may be debates around prioritisation of these objectives, improving services in these ways would constitute the addition of public value and if use of ICT is helping to achieve such objectives we would expect to see that reported in evaluations of relevant ICT projects.

In fact, of the projects we examined, just three demonstrated convincingly that they had delivered, or would in future deliver, improvements in services. We look first at those projects that have enabled services to be delivered more efficiently and then at those which have delivered increases in patient satisfaction.

Value for money

The government aims to improve cost efficiency in the NHS by at least one per cent each year (HM Treasury 2002b) and, as already noted, it has been suggested that better use of ICT might contribute towards achieving that target (Wanless 2002). For example, new

systems might eliminate laborious and costly administrative processes or provide better management information to facilitate a more sensible distribution of resources and eliminate unnecessary costs.

Of the projects that we examined, two, the government's electronic health record (EHR) pilots and the National electronic Library for Health, produced some evidence that they were likely to deliver cost savings.

Electronic Record Development and Implementation Programme (ERDIP)

Just three of the seventeen ERDIP pilots, those in Merton, Sutton & Wandsworth (MSW), in Bradford and in Walsall, were successful in finding some evidence that the use of electronic health records (EHRs) could lead to increases in cost effectiveness. In some cases it was possible to show reductions in the amount of time taken up by administration and unnecessary appointments. In other pilots this value was evident as other NHS organisations were prepared to pay to use the systems developed at the pilot sites.

In the case of Walsall, the benefits reported were identified by the project's Clinical Steering Group and were highlighted in the national ERDIP evaluation report. Specifically, the benefits reported were:

- The EHR system helps avoid the replication of tests, appointments and examinations. It was estimated that in the cases of stroke or diabetes patients these replications usually occur once per GP per week. With over 100 GPs using the EHR system, this means the avoidance of almost 6000 tests, appointments or examinations per year. With each of these estimated to cost an average of £30, this would deliver a yearly saving of £175,000.
- The system gives GPs access to the details of patients' previous hospital treatment enabling a further two to three unnecessary GP appointments to be avoided each week. Using the same calculation as above, this multiplies up to almost 15,000 GP appointments per year.
- The chiropody service in Walsall gets fifty new referrals each day, one fifth of which are unnecessary and could be avoided were information about patients available to the chiropody service at the stage when appointments are made.
- Similarly in physiotherapy, one in ten of the thirty to forty referrals made each day could be avoided.
- The system allows district nurses to access patient details and test results remotely if wireless devices are used, presumably reducing travel and administration costs. (Foord et al 2003)

While these estimates of saving are based only on the opinion of those involved in the Walsall project, rather than on more detailed evaluation of the impact of EHR, they remain the clearest evidence to emerge from ERDIP that more widespread use of electronic health records could lead to cost savings.

The MSW pilot demonstrated that it was delivering benefits by developing a product that was attractive enough to users to be commercially viable. GP practices seemed to believe that staff time savings were sufficient to justify the cost of the software. Similar commercial success was seen in the Bradford ERDIP pilot (Foord et al 2003).

While this commercial success, together with the estimated savings from Walsall, suggest that EHR may deliver better value for money, this clearly does not amount to a compelling demonstration of the value of electronic health records in cost terms. However, it does signify enough potential to warrant more robust investigation and evaluation of ongoing activity in this area.

National electronic Library for Health (NeLH)

The evaluation of NeLH was broadly positive about its potential to reduce the cost of delivery of health services. Although the report did point out that it was too early to say whether greater cost savings might be delivered in the long term through changed clinical practice, two sources of savings available in the short term were highlighted.

Firstly, savings would be made through nationally aggregated procurement of user licences for information resources such as the Cochrane database of health-related information.

Secondly, reductions in the amount of staff time spent searching for information were also expected to lead to cost savings. Using responses to survey questionnaires giving details on time saved by using NeLH and employment costs for different individuals, the researchers evaluating NeLH built three scenarios of likely savings. The savings expected in the different scenarios depended on levels of take-up of NeLH and varied between £3.2m and £12.2m over twelve months (Urquhart et al 2001).

Satisfaction with services

A high level of patient and public satisfaction with health services is clearly desirable and is an important source of public value. Satisfaction with services can often act as a useful indicator of service performance and in the health context maintenance of satisfaction is essential to ensure continued support for the NHS as a national institution. The government recognises the importance of satisfaction, is committed to improving patients' experiences (HM Treasury 2002a) and is embarking on a series of reforms in order to honour this commitment (See for example Department of Health 2003a).

Previous ippr research identifies three factors that have the greatest impact on patient satisfaction with health services:

- Patients are concerned about long waiting times for treatment, primarily because of the adverse impact that it has on their health. They also want treatment availability to be more flexible in order to fit into their work and family lives.
- Patients want a high quality relationship with those treating them, want to be treated as individuals and with empathy and encouragement. Anger, tension and antagonism in the patients' relationships with health professionals lead to lower levels of satisfaction.
- Levels of satisfaction are raised when patients feel well informed, both with general information about the performance of the NHS and with details of their personal condition and treatment (Kendall 2001).

In addition to satisfaction derived from personal experience however, it seems that others' experiences can impact on satisfaction and that fair distribution of services is a source of public value in itself. Almost eight out of ten people believe that public services should be targeted at those with the greatest need but this doesn't rule out the need for universal services; A similar proportion reject the suggestion that public services such as the NHS should be made available *only* to the poor (Public Management Foundation 1996).

In our research we uncovered two projects that seemed to have led either to increased patient satisfaction with services they experienced themselves or to enhanced fairness in the provision of health services.

ERDIP

First, two small ERDIP projects, those in Hadfield and Bury & Knowle that are briefly outlined on page 36, did provide some evidence of positive patient reactions to electronic records.

Researchers investigating patients' access to their own records as part of the Hadfield pilot felt that it was difficult to determine conclusively whether patients felt more empowered by virtue of having access to their record (Harris & Boaden 2003). In spite of this, the project uncovered several interesting findings.

Around half of the patients completing questionnaires after accessing their records reported that the experience had encouraged them to look for information about their health. Specifically, some respondents suffering from diabetes reported monitoring their blood sugar, weight, blood pressure and diet as a consequence of looking at the record. The majority of patients in Hadfield who completed a log of their use of the record reported that they had

benefited from its use. Benefits reported in questionnaires and focus groups included the ability to refer back to the record as an aide memoire and the improvements that it delivered in their interactions with their doctor.

These positive sentiments were supported by the ERDIP project in Bury & Knowle where eighty five per cent of survey respondents believed that it was a good idea to make health records available electronically and sixty one per cent agreed with the statement, "I would understand my health better if I could see my health records." (Pyper et al 2001)

These effects are welcome given recent moves to involve patients more fully in choices relating to their own care such as a 'concordance' approach to medicine taking and a shared decision making model with regard to decisions on treatment (Kendall 2001). The findings from Hadfield in relation to diabetes are particularly encouraging as the rising incidence of chronic conditions will mean patient involvement in treatment becomes increasingly important in order to avoid a shortfall in capacity (Kendall 2001).

interactive Digital Television (iDTV)

The Department of Health's pilots using iDTV to provide health-related advice also provide some evidence that the use of ICT can have a positive impact on levels of satisfaction. In the case of the pilot conducted in Birmingham, the evaluation demonstrated that user satisfaction with the service itself was high, but also that the new service may have had a positive impact on satisfaction with other NHS services (Nicholas et al 2002).

After accessing the information and advice available through their televisions, eighty one per cent of users reported that they found the site useful and easy to understand most of the time and two thirds of users said that using the service had helped them in becoming better informed. The fact that over half of users accessed the service prior to visiting their doctor means that the iDTV service also had an impact on individuals' interactions with the wider NHS. Four in ten users felt the information that they obtained from the service helped them in their dealings with their doctor and three in ten felt that information had helped in improving their condition.

Findings from this same pilot also suggested that iDTV might have a role to play in increasing the fairness of access to health services. Although it is not clear why this should be the case, the evaluation showed that those living in lower income areas were more likely both to use the service and to say they found it useful. Those living in areas with higher levels of unemployment also found the service easier to use than did those from areas of lower unemployment. A similar pilot conducted in Kingston suggested that delivering health

information via iDTV has helped to reach young men, a group that has tended to perceive health information as unimportant (Edwards 2001).

The state of evidence on any link between use of ICT and greater patient satisfaction is similar to that in relation to cost savings. Evaluations of the pilots outlined above do suggest that these projects have had a positive impact on patients' sense of being well informed and on the quality of their relationship with health professionals. As both of these are important determinants of satisfaction with services, we should remain upbeat about the potential of ICT to contribute to increased satisfaction and therefore to public value.

Outcomes

Improvements in the health of patients and of the public are clearly desirable, with self-reported health being strongly associated with individuals' life satisfaction (Donovan & Halpern 2002). And the need to 'improve health and social care outcomes for everyone' is recognised in the Department of Health's 2002 PSA (HM Treasury 2002a). Included in this objective are specific targets on issues including reducing mortality rates from major diseases and outcomes that are specifically relevant to children, older people and those with mental health problems. The existence of these targets constitutes a serious political commitment and the public's belief that the performance of the NHS is the most important issue facing the country (MORI 2003) makes their delivery politically, as well as morally, critical.

In this context, evidence that ICT is contributing to improving outcomes as well as services would put better use of technology at the heart of this government's mission and make it key to its electoral success.

Better health outcomes can be brought about through effective health services but the two are not one and the same. While the NHS plays a role in improving health in the UK, achieving maximum improvements in the health of the public requires wider action. Effective public health interventions and the promotion of a healthier lifestyle are also important in delivering better outcomes and therefore public value (Kearns 2004). For this reason, in addition to services such as NeLH which are focussed predominantly on improving outcomes through the delivery of more effective NHS care, we have also examined the impact of projects such as NHS Direct Online and the pilot use of iDTV to provide broader health and lifestyle information.

While measuring changes in outcomes is possible (see for example HM Treasury 2002b), establishing the cause of those changes is difficult, with numerous policy actions and exogenous factors that could impact on individuals' health. In the area of ICT, further problems exist in that often projects have been short in timespan or have had limited take-up,

making it less likely that health changes will occur and making their measurement more difficult.

Nevertheless, in the course of our research we have found one area where it was claimed that use of ICT might be having a positive impact on health outcomes.

NeLH

The evaluation of NeLH conducted by the University of Aberystwyth (Urquhart et al 2001) provides some evidence that the provision of information such as decision protocols or summaries of evidence electronically may have a positive impact on the outcomes of treatment. Using a combination of surveys and interviews conducted at several sites, the evaluation report draws conclusions about the likely impact of electronic information sources on clinical decision making.

It seems that the availability of the type of information resource provided by NeLH makes clinicians more likely to enquire about the evidence base for their decisions and gives them greater confidence that the decisions that they are making are evidence-based. While this doesn't constitute measurement of health gains that can be attributed to better use of ICT, it is likely that better outcomes will be the end result. More decisions taken on the basis of what has statistically proven successful in the past should lead to better results from treatment conducted on that basis.

NeLH might also help to deliver another key outcome: a reduction in health inequalities. The evaluation of the NeLH pilot also highlighted the positive impact that the service might have in reducing inequality in access to information between NHS organisations. This in turn could help to reduce geographical differences in health outcomes.

Trust

As stated at the beginning of this chapter, public value is also created if levels of trust and confidence in government are increased. Trustworthiness is seen as being important by the public and high levels of trust in the relationship between governed and government are important. Citizen's trust in government gives legitimacy to government actions and enables the creation of public value elsewhere. For example, patients' trust in doctors is key to the delivery of public value in health. However clinically competent a doctor, the delivery of improved health outcomes or increased patient satisfaction is dependent on trust. Those being treated must believe that the correct course of action is being pursued and doctors must trust patients if they are to be confident in their diagnoses and are to believe that treatment will be effective. Mistrust in this relationship would clearly lead to a reduction in public value.

Against the background of generally increasing levels of distrust (O'Neill 2002) and low levels of trust in politicians, other public servants including teachers and doctors remain highly trusted by the public (Duffy, Downing & Skinner 2003). Unfortunately our understanding of the causes of these changing patterns of trust is imperfect. However, factors such as social changes, quality of public services and the behaviour of politicians and political institutions all seem to play a role in determining the level of trust between citizens and the government (Kelly & Muers 2002).

In the health context our research reveals both opportunities and dangers in relation to trust that may be brought about by greater use of ICT. On the one hand, the ICT-facilitated improvement of services and outcomes could lead to increased trust in the NHS. Alternatively though, incidents such as breaches of personal privacy caused by unauthorised access to individuals' records held electronically could lead to a decline in public and patient trust in the NHS. There are two pieces of work that help to shed further light on issues around trust.

iDTV

The iDTV pilots mentioned earlier provided some evidence on the relationship between wider levels of trust in the NHS and attitudes towards the new television service (Nicholas et al 2002). A survey was conducted to explore the attitudes of those living in the area of the Birmingham pilot. Eighty three per cent of respondents to the survey said that they trusted the information made available via television because of NHS involvement. This, together with the fact that almost eight out of ten respondents identified the NHS as a symbol of trust, suggests that ICT projects conducted within the NHS are likely initially to get the benefit of the doubt in terms of public trust. Importantly, use of the NHS brand on the iDTV service didn't reduce the NHS as a symbol of trust. Rather, those who had heard of or used the service were more likely to trust the NHS.

While these findings are encouraging, it must be borne in mind that there were relatively high levels of satisfaction with the Birmingham pilot. It should not be assumed that these attitudes would persist should an incident, such as an unauthorised release of personal information, occur and be publicised in the media. This is an issue to which we return in chapter five.

Share with Care

Research conducted for the NHS Information Authority recently (Consumers' Association 2002) confirms that levels of public trust in the NHS are high. However, the research also revealed low public awareness of the way the NHS uses and shares information and of the possible relationship between the use of information and the improvement of patient care. Further research conducted by the Consumers' Association (Consumers' Association 2003)

confirmed this finding and also highlighted potential public concerns about use of personal information.

This low level of awareness of the use of information highlights the potential that exists for trust in the NHS to fall dramatically should the public first become aware of ICT use in the health service in the context of, for example, abuse of personal information. As we highlight later in this report, this suggests that further research should be conducted to assess the impact of new uses of ICT on trust as the National Programme for IT and other projects develop.

The extent and quality of evidence

In pulling together the available evidence in this chapter, our aim has been to draw on existing evaluations in order to develop a coherent body of evidence setting out the benefits that use of ICT could deliver in health. We hoped to find effective research that had been conducted on applications and services across the e-health agenda which we could use to shift the discourse around ICT and health to more evidence based ground.

Unfortunately the extent of evaluation of e-health projects has been limited and those evaluations that have been conducted are not of the quality that we hoped to see. In this chapter, therefore, we have limited our presentation of evidence to cases where the use of ICT seems to have led to the creation of real additional public value. Clearly the evidence is thin given the overall scale of activity. The important question is what conclusion we should draw from this discovery.

It is possible that only the few benefits set out in this chapter have been delivered through these projects. In chapter five we examine some of the barriers that may have prevented the creation of public value through ICT projects in the health sector. However, in the next chapter we take a more optimistic view: that benefits have been delivered, but just cannot be demonstrated fully because of poor or misguided evaluation. We highlight some of the weaknesses with the evaluations that we have examined and demonstrate the importance of more effective evaluation in the future.

Chapter 4: Evaluating ICT in health

The contrast in the previous chapter between the large number of evaluations that we examined and the small amount of evidence of public value delivered that we were able to present suggests that problems exist in the evaluation of e-health projects. In this chapter we make the case for effective and relevant evaluation of e-health projects, arguing that strong evidence of the impact of ICT use is essential if future projects are to be politically viable and are to add public value. We then go on to highlight several problems with the evaluations that we have examined, making clear how difficulties with evaluation processes may mean that public value delivered might not be shown clearly in evaluation reports.

The rationale for evaluation

Evaluating e-health projects is likely to consume considerable money that might alternatively be used elsewhere. While there is undoubtedly a danger of over-evaluation however, it is wrong to see evaluation simply as a drain on resources that would otherwise be helping to deliver benefits to patients elsewhere or as a distraction from the main elements of the project. Rather, effective evaluation is essential if investment in new ICT systems is to deliver maximum public value. Specifically there are two broad justifications for conducting evaluations. Firstly, the effective evaluations of previous projects allow us to say whether those projects were worthwhile and help to inform the development of future potential projects. Secondly, the findings of evaluation studies can help to build appropriate support for the use of ICT in health among relevant stakeholders.

Practical reasons for evaluation

During the dot com boom of the late 1990s many e-government projects were conducted without adequate evaluation. The prevailing attitudes to technology were such that increasing use of ICT was often seen as good in itself. Fortunately, this sentiment is now encountered less often and there is an emerging consensus that technology-related projects must prove their value similarly to all others. A more pragmatic focus on what ICT use has achieved is to be welcomed in the health sector, particularly while demand for resources is so high and the need to deliver improved services so acute.

The Treasury's recently updated guide to evaluation states:

Evaluation examines the outturn of a policy, programme or project against what was expected, and is designed to ensure that the lessons learned are fed back into the decision-making process. This ensures government action is continually refined to reflect what best achieves objectives and promotes the public interest. (HM Treasury 2004 s. 7.2)

The evaluation process should facilitate the learning of two types of lessons from projects already underway or completed.

First, by comparing the a priori justification for the project and the outcome of the evaluation lessons can be learned about the way that ICT projects are conceived and developed. Failure to properly define the aims of projects and to adequately link the implementation of the project to those aims has been identified as a key cause of previous project failures. In response, measures such as more rigorous development of business cases and the introduction of the Office of Government Commerce's gateway process have been put in place. However, for these new processes to ensure that in future only those e-health projects which are likely to lead to the delivery of real public value are initiated, rigorous examinations of whether previous projects have delivered what they promised are essential. Without effective evaluation of projects existing problems around project justification and planning are likely to persist.

Second, evaluation of previous projects would help to inform the development of current, similar e-health projects. A vast number of e-health projects have been conducted but too often the lessons that could have been taken from them have been missed because of inadequate evaluation. While it would be unwise to stifle innovation by enforcing an excessively onerous evaluation system, failing to improve on current evaluation practices will mean that similar mistakes will continue to be made and successes will not be emulated. The need for evaluations to point the way for future projects is particularly important in the case of pilot projects, the outcomes of which will determine whether and how a service might be deployed on a wider scale.

Building support for investment in ICT

If professionals, patients, policymakers and the public are to be persuaded that spending on ICT related projects is worthwhile, it is important that there is convincing evidence available of the value delivered through such projects.

That use of ICT has remained low in the NHS can be partially explained by differences between the introduction of new e-health services and that of new drugs or other interventions unrelated to ICT. The work of organisations such as the Medicines and Healthcare products Regulatory Agency (MHRA) and the National Institute for Clinical Excellence (NICE) ensures that professionals can be confident that new drugs or medical devices are both safe and effective for a given purpose. In contrast many new uses of ICT have developed and have often been inadequately evaluated, leaving uncertainty around issues including their effectiveness and ethical and legal impact. It is unsurprising that this uncertainty has led to

uneven take-up of ICT in healthcare delivery. In order for there to be professional support for new e-health products and services, effective evaluation is needed to demonstrate the value of ICT in improving patient care.

Similarly, patients should be able to access information about the effectiveness of ICT systems being used in the delivery of health care. As new systems such as electronic health records are introduced, demonstrating that they help contribute to an improvement in health services will be important if patient concerns over safety or privacy are to be overcome. It will be particularly important that patients have adequate information about the effectiveness of systems such as those used in telemedicine as they take more responsibility for choices about their own care and whether they want to be treated using such systems. This kind of information can only be made available through properly conducted evaluations.

Finally, the findings of evaluations will be hugely important in enabling a measured political discussion about the role of ICT in health. Government has not been good at systematically gathering evidence of the benefits of technology related projects and consequently ICT projects are more often noticed when they fail than when they succeed. This failing has led to a shift in the political agenda, from a situation where use of new technology was generally perceived as a good thing to one where ICT projects are treated with suspicion. As we demonstrated in chapter three, few previous e-health projects have produced real evidence of public value. While there seems to be plenty of potential for technology to improve health and healthcare, without this evidence the current spending on ICT for the health service remains a political gamble. If the projects currently being implemented cannot in future demonstrate that they have added value, then public and political opinion may turn not just against spending on ICT but also against the NHS in general given the importance of ICT in current modernisation efforts.

The challenge of evaluation

Even where the need for evaluation has been properly appreciated, considerable barriers must be overcome in order to assess the effectiveness of a new service that uses ICT. Friedman and Wyatt have suggested that barriers to the evaluation of medical informatics exist because of the nature of health care delivery, of ICT systems and because of the process of evaluation itself (Friedman & Wyatt 1997).

The practice of medicine and delivery of healthcare are extremely complex with practitioners needing a vast amount of knowledge and having to apply that knowledge to patients, each of whom is likely to have a different combination of conditions requiring different treatments. This complex environment poses clear challenges for those wishing to discover the effect of the introduction of a new information system. First, the new system might impact on the

delivery of healthcare in multiple ways making it difficult to decide which element of a new application or service is having which effect. This task is made more difficult by the complexity of medical decision making, the complex needs of patients and the fact that it is rare that diagnoses are made with certainty and that the 'correct' treatment for a given patient may be open to debate (Friedman & Wyatt 1997 pp. 5-8). Second, it might take some time for the effects of a new system to become clear. Possible benefits of new ICT systems may only become apparent after working practices have altered to take advantage of the new resource and this process could take several months or years, presenting a particular problem for those looking to evaluate pilot projects (Friedman & Wyatt 1997 p. 7). Finally the introduction of a new ICT system may lead to the delivery of benefits in one area but costs in another, making it difficult to say unequivocally whether a project has been successful or otherwise.

Friedman and Wyatt also highlight barriers related to the complexity of ICT resources themselves arguing first that large computer programs require considerable resources to be spent in order to test them thoroughly and ensure that they perform as they are intended to. The interaction of the different elements of a computer system (such as the interface or method of storing information that it uses) also needs to be examined if the impact of the whole system, as well as of its constituent parts, is to be understood. When the rapid development of ICT and the ability of some systems to adapt to or be altered for the specific environment in which they will be used is also taken into account, it becomes clear that evaluation of a new computer system presents different challenges to those faced when testing a new drug (Friedman & Wyatt 1997 p. 9).

Finally, there are barriers caused by the process of evaluation itself. Friedman and Wyatt point out that those using a system may change their behaviour as a consequence of being studied. There is also the possibility that there may not be enough patients or professionals using a new system to support a rigorous evaluation and the findings of evaluations might vary depending upon whether information is obtained from, for example, the users of a system or its developers (Friedman & Wyatt 1997 p. 10). Finally, where a number of simultaneous changes have been made to the process of service delivery, it will be difficult to discern the impact of each change individually. This makes it hard to determine the extent to which better use of technology has led to any improvements in services, outcomes or trust.

Given the limited amount of evidence of benefits delivered by e-health projects that we highlighted in chapter three, it seems likely that at least some of these potential barriers are preventing successful evaluation of health and ICT related projects in practice. Our examination of evaluations has also suggested that inadequate evaluation has at least four specific causes. First, time and resource problems seem to be hampering effective

evaluation. Second, the rationale for evaluating often seems unclear, leading to the use of evaluation frameworks which may not be appropriate. Third, it is not clear that baseline measures are being taken before the launch of new e-health projects and that sufficient data are available during projects in order to ensure that a meaningful assessment can be made of the project's impact. And fourth, there are problems related to the ways in which evidence is gathered and then used to inform the conclusions of evaluations.

Insufficient time and resources

Each of the six areas of e-health activity that we outlined in chapter two have been the subject of considerable evaluation and the full list of evaluation reports that we examined is given in chapter three. However, too little solid evidence is available from the reports that we have studied because insufficient time and money was allocated to evaluation.

For example, in the case of the electronic transfer of prescriptions (ETP), the usefulness of the evaluation seems to have been lessened as delays in the development of the pilot services meant that the evaluation team had inadequate information about how the projects were working. The ETP pilots were hampered by problems recruiting patients and also by technical difficulties, meaning that the ETP systems were not processing volumes of prescriptions sufficiently large to be a basis for evaluation until after the evaluation process commissioned by the Department of Health was complete. In other words the evaluation team was forced to finish its work before the ETP systems were really up and running. Similarly, in the pilots using interactive digital television (iDTV) to provide health related information one of the pilots was delayed and therefore fell outside the period of evaluation. Clearly it is unfortunate if pilots or other projects are run but are not evaluated simply because of inflexibility in the timetables established for evaluation.

It also seems that in some cases insufficient funding has been given to enable evaluation to be conducted in detail on the ground. It is sensible to be wary of overloading those working to deliver projects with extra work associated with evaluation and extra resources may be needed if evaluation is to be integrated with projects from the very beginning. In some cases, such as the evaluation of the government's electronic health record pilot program ERDIP, we found that external evaluation teams faced problems caused by a lack of available management information, a problem that we return to later. This absence of reliable data on projects' performances may have been caused by too great a proportion of resources being allocated to simply delivering projects and too little to enabling effective evaluation.

Unclear rationales for evaluation

If evaluations are to produce useful findings, it must be clear from the outset what they are supposed to achieve. As we suggested in the first section of this chapter there are numerous valid reasons why we might want to evaluate e-health projects and if evaluations are to be

successful it is important that it is clear what they are intended to deliver. In particular, we expected to find that the aims of evaluations would relate clearly to the aims of the projects that were under examination. For example, an evaluation of a pilot project would seek to conduct summative evaluation, in order to determine *whether* the service should be available more widely as well as formative evaluation, in order to decide *how* a possible future rollout of the service should happen. Similarly, a project being launched with the expectation that it would solve a specific problem or improve a particular service or outcome would be judged against those claims through evaluation.

This link between project objectives and evaluation certainly seemed to exist in some of the evaluations that we examined. In the case of the pilot trials of iDTV for example, evaluative criteria included:

- users' experience and perceptions of the service;
- the range, quality and appropriateness of the services offered;
- co-ordination with other health services available;
- impact on NHS of supporting the service;
- impact on users' use of health services;
- impact on users' health status; and
- impact on perceptions of the NHS. (Nicholas et al. 2002 p. 13)

As a consequence that evaluation provided some useful information about public value delivered through the pilots which we highlighted in chapter three. In other cases however, where we have been unable to quote evidence about benefits, part of the reason is that there was insufficient focus on the importance of evaluation and the specific reason for evaluating a given project. This observation offers a warning for the future: as a lack of clarity about the need for evaluation has led to a situation today where there is too little evidence about the impact of e-health projects, insufficient focus on evaluation now means there will be little evidence in the future too. While establishing stringent evaluations presents a political risk if some projects are seen to have failed, not doing so is also risky. Under-evaluation would mean little evidence with which to counter the arguments of those who suggest that public sector ICT projects are always a disaster. This is a particular risk in the health context given the high profile nature of NPfIT.

Inadequate baseline measures and insufficient data gathering

Recent commitments to reduce the number of targets faced by the NHS (Department of Health 2004b) suggest that the health service has sometimes been overburdened with a centrally imposed performance management regime. However, in the area of e-health we have found that appropriate data is often not available to facilitate evaluation of projects.

While it is important to recognise that even with access to detailed data on the use of e-health services and on patient satisfaction and health outcomes, it will not be easy to draw reliable conclusions about the effect of one on the other. It is equally important to note that without that data, there is no chance of that happening. This data cannot be gathered solely at the end of the project but rather measurement of key indicators in evaluated studies must begin before projects begin. Without a clear picture of the situation before projects begin, it is impossible to calculate the effect of the new service. In the evaluations that we examined, we have come across three problems in relation to accessing data.

The first problem, as mentioned above and by Friedman and Wyatt, is that projects do not produce data sufficiently quickly for it to be considered as part of the evaluation process. This was the case in the ETP trials where low patient take-up and technical problems meant that the evaluation team did not have access to as much information as had been expected. Similarly in the iDTV pilots, some aspects of some of the services suffered from low levels of use. For example, few people took up the opportunity to use a service enabling cable TV users to book appointments with their GPs through their televisions (Nicholas et al. 2002 p. 74). This makes it difficult to evaluate the impact of these services.

In a second set of cases, once projects were running, measures did not seem to be in place to ensure that appropriate information about new e-health services was being gathered. In their evaluation of NHS Direct online, the National Institute for Clinical Excellence suggested that some of the performance indicators then being used by the service were measuring capacity rather than effectiveness and endorsed plans to alter this (CHI 2003a p. 42). PA Consulting, in their evaluation of the ERDIP projects were similarly critical about the lack of information on which they could draw, saying that:

None of the sites evaluated so far, has been as systematic as we would have expected for a funded study, in identifying tangible benefits arising from the new systems, whether in health care information quality; process improvements; or in quantifiable economic benefits. (Foord et al. 2003 p. 5)

Finally, there are cases where information seems to exist but has been unavailable to those evaluating projects. In the iDTV pilot for example, there were instances where potentially useful information (such as subscription information of log data from interactive services) was withheld by private sector organisations involved in the delivery of the projects. Given the dual needs to evaluate projects effectively, and to ensure only appropriate use of personal information, this is an issue which should be addressed in e-health projects.

Problems with robustness of evidence and resulting conclusions

It is crucial, given the importance of the financial and ethical decisions that might be made on the basis of their findings, that there is absolute clarity about the reliability of evaluations of e-health projects. During our examination of evaluation reports we had concerns in some cases about the transparency and verifiability of the manner in which information had both been collected and then used to support conclusions.

In addition to our concerns noted above about the simple absence of information in many cases, there were instances where there was too much reliance on testimony from those involved in projects. We do not believe that it is inappropriate for local project managers to be involved in evaluation. Rather, they have a wealth of knowledge about the project under examination on which it is right for any evaluation to draw. Neither do we have a simple preference for numerical data in preference to more nuanced personal opinion, recognising that evaluation of a new ICT system is very different to a randomised controlled trial of a new drug. It is important though to recognise that there are possible problems with basing evaluations overwhelmingly on the testimony of those managing or closely involved with the project, whose personal fortunes may be closely linked to those of the project itself. This problem is accentuated when claims are made and it is unclear whether they are based on personal testimony or some more methodical examination.

There were also occasions where evidence presented in reports did not clearly support conclusions that were drawn. It is useful to have synoptic reports, which bring together evaluations of similar small projects in order to make conclusions on the basis of the widest possible pool of evidence and to inform decision making. However, in order for those summary reports to have value, it needs to be clear that they provide an accurate representation of all the evidence uncovered at the local level. That means a clear link between evidence gathered at project level and conclusions made at that level and a further clear link between conclusions at the local and national levels. It needs to be clear that all evidence from the local level has been used in determining overall conclusions and readers of synoptic reports should be able to identify and verify the specific evidence that informs an overall conclusion. If, as we observed, too great an emphasis is sometimes put on one, perhaps unreliable, piece of evidence in making a conclusion locally and that conclusion is given too much prominence in a synoptic report, the value of that synoptic report is greatly reduced.

The overemphasising of possible or partially uncovered benefits reflects the weakness in the evaluation regime that we have highlighted in this chapter. If evaluation procedures were sufficiently strong and evidence were available of all benefits delivered through a project, this tendency to inflate findings would be less likely to exist.

Conclusion

In the early part of this chapter we have made clear that we believe evaluation to be crucial. Evaluation helps us to pass judgement on previous e-health projects, informs spending on ICT and allows the development of an informed debate around use of e-health and the establishment of appropriate support among patients, professionals and the public for spending in this area. In the current climate, with the NHS so important an issue for many citizens and demands on public funds so acute, it ought not to be possible to argue that the current inadequate levels of evaluation should persist.

However, given that evaluation programmes cost money, there is a debate to be had about the appropriate *level* of evaluation. Crucially, rectifying many of the problems that we have highlighted in this chapter need not consume extra resource. A great deal is already being spent on evaluation and relatively minor changes, which we suggest in chapter six, would ensure that money spent delivers more useful evaluation outcomes. This is important because improved evaluation outcomes are likely over time to increase the amount of benefit delivered, not simply the amount of benefit measured.

Chapter 5: Barriers to successful use of ICT in health

While the previous chapter argued that problems with evaluation might be the reason that there seems so little evidence of public value delivered through e-health, this one addresses a more worrying potential explanation. In the following pages we examine possible barriers to the successful implementation of e-health projects that might be actually preventing the delivery of public value. We group these potential barriers into four groups: insufficient funding and poor procurement, failure to involve the users of ICT systems, failure to properly uncover the attitudes towards ICT of patients and the public and finally a potential inability to manage the change caused by the introduction of new ICT.

Insufficient funding and poor procurement

Funding

Effective use of ICT in the health service has been prevented in the past by inadequate funding for new technology projects. The primary problem set out by Derek Wanless in his report of 2002 was simply that too little was being spent on ICT overall:

The health service's annual ICT spending per employee was lower in 2000 than in any other sector of the economy considered. The UK health service also spends a significantly lower percentage of its budget on ICT than the health services of comparator countries (Wanless 2002 p 55)

To give some idea of the scale of spending, Wanless estimated that the NHS in England spent about £1.1bn each year on ICT and essentially recommended a doubling of ICT spending in order to deliver the benefits that he anticipated. The government responded to this recommendation by setting aside £2.3bn over three years in Spending Review 2002 for the newly formed National Programme for IT in the NHS, a marked increase in central funding for ICT. The NPfIT has now signed ten year contracts committing the health service to spending at least £6bn centrally on ICT over that period.

This new funding for NPfIT has certainly gone some way towards meeting Wanless' recommendation to increase spending on ICT but in his 2002 report he also mentions other issues associated with the funding of ICT projects in the health service. First, he highlighted that much health spending was set locally. While not necessarily a problem, local allocation of resources for ICT had led to a situation where very uneven progress was being made across the country. Although NPfIT is set to procure some new systems for the whole of England, much of the implementation of these systems will be the responsibility of local organisations. As we discuss later in this chapter, the task of managing the change process



associated with the systems being procured through NPfIT will not be a simple one. In this context it is crucial that sufficient resources are available at the local level to allow maximum benefit to be made of the spending that has already occurred.

Wanless' second concern was that too often funds earmarked for spending on ICT had been diverted into other areas in order to meet short-term goals. While funds have been clearly allocated for central spending on ICT until 2005/06 no money is guaranteed beyond that and funding for ICT at a local level remains vulnerable given the competition for resources within the health service. Concerns have been raised that the implementation of new systems procured through NPfIT may cost vastly more than the hardware and software itself (BCS & ASSIST 2003) and without this level of funding there is a risk that new systems such as those for electronic booking or transmission of prescription information will remain underused.

Procurement

Even if account is taken of problems associated with insufficient funding, inability to effectively procure suitable ICT systems has historically proved to be a barrier to effective use of new technology by the NHS. This problem has proven difficult to solve and has been mentioned repeatedly in Department of Health policy documents (NHS Executive 1998 and Department of Health 2001a) as well as in Wanless' report of 2002. While the complexity of most ICT projects and the speed of change of technology are likely to make ICT procurement challenging, two problems are particularly worth highlighting:

First, the health service has simply lacked the capacity to carry out procurements at a reasonable pace which result in suitable contracts. In the past the procurement process has been drawn out leading to high costs for both purchasers and suppliers as well as frustration that things were not proceeding more rapidly (NHS Executive 1998 p 92). This problem is of particular concern in the area of ICT where rapidly changing technology means that delays in the procurement process can lead to the purchase of systems that are already out of date.

This steady pace of procurement, however, was not leading to suitable contracts being signed between suppliers and NHS organisations. There has often been too little attention paid to the real reason why new ICT systems were being bought and consequently contracts were often insufficiently focussed on the real information requirements of the procuring organisation. Rather a new system was seen as 'fit for purpose' so long as it worked irrespective of whether it really helped to meet the organisation's needs (NHS Executive 1998 p 92). In addition, the NHS' relationships with suppliers once contracts had been signed were often characterised by confrontation leading to sub-optimal results.

Second, the lack of a coordinated approach to NHS ICT procurement meant that the NHS was not maximising the amount of public value delivered through its spending on new technology. As mentioned by Wanless, diverse and incompatible systems were being procured meaning that benefits, such as those which might be delivered by a national integrated patient health record, were not being delivered. In addition, the health service was not taking full advantage of its huge buying power in negotiations with suppliers in order to negotiate improved deals on widely used software. This fragmented approach to procurement was also having undesirable knock on effects on the market for health-related ICT. As procurements were being conducted locally and were generally relatively small in comparison with many other government ICT projects larger ICT companies, whose expertise might prove useful to the health service, did not have incentives to become involved in bidding for work in the NHS.

Of all the potential barriers to delivery of benefits through better use of ICT in the NHS that we cover in this chapter, poor procurement practice is the one that has been most reduced through the National Programme for IT in the NHS. One of the programme's aims was the 'coordination, acceleration and where appropriate simplification of procurements' (Department of Health 2002b p 4). Certainly the procurement process conducted as part of NPfIT has clearly been of a different order to those that have gone before and looks likely to have solved several of the problems that have been identified with previous procurements.

The procurement of systems to provide the NHS Care Record Service (NHS CRS), e-booking and e-prescriptions have been concluded extremely rapidly given their size. All contracts to provide elements of NHS CRS were awarded by January 2004, within one year of the procurement process beginning (with publication of a notice in the Official Journal of the European Communities). It also seems that suppliers will be held to account if they fall short in their contractual obligations with one supplier recently being forced to make compensatory payments for late delivery (Kable 2004). While this ensures that the ICT systems should be delivered according to the contracts written however, the delivery of real benefit depends on change by local NHS organisations (an issue we explore later in this chapter). One possible area for future exploration is the possibility of paying supplier organisations according to the delivery of real public value, where they have some control over issues such as change management and training.

The national programme has also probably enabled the NHS to make better advantage of its buying power in negotiations with suppliers. It is likely that, in addition to ensuring compatibility of systems, a considerable amount has been saved by procuring some new systems centrally rather than locally. Money also seems to have been saved following central

negotiations on the use of common software. For example it was estimated that up to £100m might be saved in licence fees following a nationwide deal with Oracle (Arnott 2004b).

It is yet to become clear whether NPfIT has improved the quality of relationships between suppliers and the NHS. Some very large companies, of the type that are often involved in other large central government ICT projects, have now become more involved in the health sector. However, some companies did withdraw from the procurement process at late stages and it remains to be seen whether the correct balance has been achieved between getting value for money for the health service and allowing suppliers to make profits.

While NPfIT seems to have solved many of the problems with procurements that have been identified in the past, it is important to recognise two qualifications. First, as fast as the procurement process has been, its real success can only be determined once public value is, or is not, delivered in reality. For example, if the speed of procurement has prevented crucial involvement of clinicians and therefore reduced the benefits delivered, then its rapidity has been a disadvantage rather than advantage. Second, considerable procurement of ICT systems continues outside NPfIT and it is important to recognise that this may continue to be conducted poorly without further support.

Failure to involve systems' users

With all ICT projects, early and regular involvement of the system's eventual users is important if the project is to be a success. The Parliamentary Office of Science and Technology's (POST) report on government ICT projects (Parliamentary Office of Science and Technology 2004) sets out three reasons why effective user involvement is essential:

First, proper account of users' needs must be taken in the design of the system itself. Very often those designing new ICT systems do not have a detailed knowledge of the organisations for which those systems are being designed. Effective consultation with the system's end users is therefore crucial if technology is to be a help rather than a hindrance to them in their work. While it is possible that technology might be used to alter ineffective working practices, this process should be based on a thorough understanding of current methods of working and their strengths and weaknesses.

Second, effective consultation during the development of services is likely to lead to a greater sense of ownership of the finished product by its users than the presentation of a new ICT system as a fait accompli. New information systems will only deliver benefits if they are used and those benefits are likely to be greater if ICT enables new, more effective and efficient ways of working. This is only likely to happen if those responsible for using the new systems as part of their jobs understand and support the introduction of those systems.

Finally, it is important that users are involved in the design and delivery of new systems in order to ascertain and deliver their training needs. Insufficient training could lead to new, potentially useful ICT being underused or to excessive dips in productivity as staff take extra time getting used to the new systems. Provision of training also needs to be sensitive to the time pressures that may already be being experienced by potential users. These problems are accentuated in large projects that are being introduced quickly, where resources required for effective training are large and time is short.

Barriers to use by professionals

While two of the projects that we outlined in chapter two have patients and the public as their end users, in very many cases health related ICT systems will be used by health professionals. The three justifications for effective user involvement outlined above apply equally to health professionals as to other users. Evidence from the evaluation reports that we studied confirmed importance of effective user involvement and the veracity of specific barriers to effective use of ICT by *professionals* set out in previous ippr work (Wyatt 1998).

Increased workload

New ICT systems may lead to an increased workload for clinicians. While new technology should make the health service more efficient in the way it handles information, evidence is mixed about the impact of ICT on the amount of time clinicians spend recording patient details. For example, in order to ensure that information can be shared effectively electronic patient records impose a structure that must be used for patients' details that may be unfamiliar and will prevent clinicians from using personal abbreviations. As well as the time implications of needing to develop ICT skills, which we discuss in a later section, recent research sponsored by the Department of Health (Booth, Kohannejad & Robinson 2002) has also shown that doctors need to develop new communication skills in order to accommodate the use of ICT during consultations.

Evaluations of electronic health record projects conducted by ERDIP emphasised the importance of considering their impact on health professionals (Foord et al 2003). Use of EHR at the Bradford pilot site led to longer consultations and surgeries, an effect that has serious implications for professionals who are already extremely busy. Evidence from several of the pilot sites suggested that at present the costs to professionals in terms of additional workload are thought to be outweighed by the benefits of the new systems. However, it is unclear whether this would be felt to be the case by all clinicians, particularly given the paucity of evidence of benefits produced during ERDIP. The final ERDIP evaluation report (Foord et al 2003) also makes clear that account must be taken of users' general attitudes towards ICT irrespective of the functionality of the specific system being introduced.

Threats to patient and professional confidentiality

Health professionals may be concerned about the impact of new systems on confidentiality. First there may be concerns around the possible ability of unauthorised persons to access patients' medical histories. Given the importance of trust in the relationship between clinician and patient, a confidentiality breach of this kind could have an adverse effect on the professional's ability to treat their patient. This possibility is clearly of concern to clinicians with GPs recently suggesting that they might not engage with NPfIT because of fears over the issue of patient consent (Arnott 2004a). In addition however, professionals may be concerned about the confidentiality of information on their performance. In April 2004 the Commission for Healthcare Audit and Inspection (CHAI) took over responsibility for clinical audit within the NHS and this reform is just one element of a wider move towards greater levels of clinical audit and governance (Sally & Donaldson 1998 for further discussion of this). Better performance information, which might be delivered by new ICT systems, will be essential if this move is to lead to improved performance (CHAI 2003). However, health professionals may be concerned that this will enable greater levels of scrutiny and in some cases that this might lead to the discovery of inferior clinical performance.

A further issue related to professionals' privacy and safety arose in Birmingham's interactive digital television (iDTV) project where NHS Direct nurses provided consultations during which patients could see them on their television screens. While the nurses did identify positive aspects of the service, they did have concerns about their security and privacy (Nicholas et al 2002). The fact that they could be seen by callers caused several nurses to feel concerned that they would be identified and one other nurse felt that appearing on the screen made her feel uncomfortable and therefore made her rapport with patients inferior. While concerns of this type are clearly important, it should be noted that those evaluating this project go on to highlight the fact that these findings are based on a small number of interviews and suggest that further research is needed to explore the attitudes of the health professionals delivering the service.

Perceived threats to professional roles

New ICT systems may also lead to three concerns from clinicians that are related to conceptions of professionalism. First, the provision of guidelines such as those available on NeLH and the ability to monitor use of those guidelines using ICT may be perceived as limiting clinical freedom. This, together with the use of ICT to encourage inter-disciplinary working, may lead to resentment of a perceived increase in control over clinicians' work. Second, clinicians may feel that greater use of ICT leads to a loss of power. This may occur as patients become more informed, as junior, and more ICT-literate, professionals begin to use new systems and as ICT professionals take on roles which some believe should be performed by clinicians themselves. Finally improved use of ICT may contribute to a loss of

pride. Considerable emphasis is currently given to the ability of doctors to recall medical knowledge but ICT facilitated access to medical guidelines or libraries of evidence will make the ability to memorise large amounts of information less important than it has been in the past. The increasing importance of clinical and communication skills may be perceived as a threat by doctors who continue to believe in the greater importance of medical knowledge.

Ethical and legal uncertainties

Legal concerns may also present a barrier to the greater use of ICT in health. Wyatt cites uncertainty over where responsibility should lie when patients are treated using decision support systems or treatment guidelines, but there are wider legal implications of using new technologies. Guidance for GPs on the use of the internet (General Practitioners Committee 2001) makes clear that the medico-legal risks associated with ICT are unknown. More recent guidance from the Medicines and Healthcare Products Regulatory Agency (MHRA) (Medicines and Healthcare Products Regulatory Agency 2004) also highlights the uncertain ethical and legal implications of using unproven technologies in healthcare. The MHRA guidance highlights as an example the use of mobile telephones with built-in cameras to transfer x-ray images as one which has not been adequately scrutinised and therefore exposes users and patients to unacceptable risks.

There may also be ethical issues related to prioritising some patients in relation to new e-health services. In the Birmingham iDTV pilot, for example, patients wanting to use the televisual consultation being trialled were prioritised above other NHS Direct callers in order that sufficient video callers were seen to enable evaluation of the project. There was some anxiety among the healthcare staff questioned about the fairness of prioritising callers to the pilot service above others (Nicholas et al 2002).

NPfIT and professional involvement

Given the findings above, it is important to note that there have been some concerns raised in recent months about the level of professional involvement that has been conducted before, during and in the few months immediately following the procurement phase of the National Programme for IT in the NHS.

A recent brochure published by NPfIT to inform stakeholders about the programme's progress (NHS 2004b) sets out the consultation strategy that is being taken, which has four elements. First, selected stakeholders of each of the programme's projects were consulted throughout the procurement process with the aim of discovering their requirements and concerns. Second, Regional Implementation Directors have been appointed in each of the five clusters and it is their responsibility to ensure that they sufficient stakeholder engagement occurs in their respective areas of responsibility. Third, in October 2003 a National Clinical Advisory Board (NCAB) was established. Made up of representatives from professional bodies, NCAB



is intended to allow professionals to give 'authoritative, structured and detailed input to the National Programme' (Department of Health 2003m). Finally, a national stakeholder group has been established in order to coordinate this stakeholder engagement across the programme.

Concerns raised both in the ICT (such as Collins 2004) and medical (such as Booth 2003) specialist media focus on three issues. First, whether the national programme has consulted a large enough number of clinicians. While it would be possible to consult too widely and slow the procurement and development of new systems excessively, initiatives such as NCAB are highly centralised and rely on the opinions of a small number of professionals' representatives.

The most recent in a series of surveys conducted by Medix (Medix 2004), a company providing information for doctors online, makes worrying reading in this regard. While those doctors responding were reasonably enthusiastic about NPfIT and tended to believe that it would improve clinical care and their working life, results in relation to consultation are less encouraging. While 88% of respondents felt that it was important to consult with local clinicians, 86% felt that they personally had been consulted inadequately or not at all. Seventy seven percent of respondents said that they had 'not much information' or less about NPfIT. Nurses also appear to be enthusiastic about the National Programme with seventy per cent of respondents to a survey conducted by the Royal College of Nursing (Royal College of Nursing 2004) saying they believed that integrated electronic health care records would lead to improvements in clinical care. However, while over nine out of ten respondents believed that consultation with individual practising clinicians was important, fewer than one in ten thought they had been consulted adequately.

Second, it is unclear whether the involvement of stakeholder has happened sufficiently early in the procurement and development process. For example, NCAB held its first meeting at the beginning of October 2003, just six days before the award of the contract to provide the national electronic booking system. While NPfIT had been involving clinicians during the procurement phase, it is arguable that a wider consultation should have commenced earlier and it is unclear to what extent flexibility in the contracts that have now been signed will permit NPfIT to be responsive to professionals' needs.

A recent debate over GPs' electronic record systems highlights the potential problems that might arise as a consequence of consulting clinicians too late. Shortly after the award of the Local Service Provider contracts by NPfIT, EMIS, a company that currently provides ICT systems to almost six out of ten GP practices, announced that it would not sign contracts to act as a supplier to the LSP contractors. Some current users of EMIS systems have insisted

that they should continue to be able to choose which systems they use so long as it complies with NPfIT standards. Although it may now be moving towards resolution, this conflict between the programme and clinicians is likely to impede the delivery of better care through improved use of ICT and might have been avoided had there been earlier effective consultation with stakeholders.

Third, some have asked whether it will even be possible to respond to the preferences of clinicians sufficiently to encourage them to use new systems when the procurement is occurring nationally. Frank Burns, author of the government's 1998 health and ICT strategy *Information for Health*, in which implementation of new systems was to be more local, has stated, 'I am honestly not sure that getting high levels of local clinical ownership is remotely possible with procurement decisions that are covering half the country' (Collins 2003).

The importance of responding to the preferences of local health professionals has been highlighted in research sponsored by the Department of Health that has been published recently (Jones, Hart, Henwood & Gerhardt 2003). In examining the use of EHRs in the context of maternity, those conducting the research concluded that involvement of staff from all levels, rather than just more senior staff, in decisions on EHR was important if systems were to be successful. Not doing so, it was found, led to resistance against new systems by clinicians that might signal that working practices or professional norms had been misunderstood in the design of the new system.

Two recent events give a mixed message about levels of professional involvement in the programme. In March, the Deputy Chief Medical Officer was appointed as joint Senior Responsible Officer for the programme, an appointment seemingly intended to signal a new effort to engage with relevant stakeholders. However, the positive effect of this welcome news might be reduced following the more recent resignation of the chairman of NCAB, Professor Peter Hutton, and its subsequent disbandment. At the time of Professor Hutton's resignation, his concerns related to professional engagement were highlighted in the media and prompted the announcement by the Department of Health that procedures for engagement with professionals were to be reviewed. NCAB (and the Patients Advisory Board originally established at the same time as NCAB) have now been replaced by the Care Record Development Board (CRDB), which is intended to involve all relevant stakeholders in decisions related to NPfIT.

While it may be some time before it is possible to tell conclusively whether the consultation conducted as part of the national programme has been sufficiently early and comprehensive, the continuing low levels of awareness of the programme among doctors and the development of conflicts such as that over EMIS are cause for concern.

Failure to uncover patient and public attitudes

While new technology should improve the quality of information and care experienced by patients and the public, achieving this will become more difficult if these groups have concerns about the way that ICT is being used. Most obviously, it is easy to imagine that public and patient concern about how their information will be stored and shared would present a considerable barrier to effective use of new ICT systems in health.

Of the projects that we examined in our search for benefits delivered by improved use of ICT two, the pilots using digital television to deliver health information and the Electronic Record Development and Implementation Programme (ERDIP), examined public and patient attitudes to the services they were developing. As we described in chapter three, evaluations of both of these projects reported that there had led to increased levels of satisfaction with services. In the case of the iDTV pilots, patients' interactions with clinicians were reportedly improved (Nicholas et al 2002). Patients who accessed their own health records as part of ERDIP pilots changed their behaviour in ways likely to improve their health (Harris & Boaden 2003).

In addition to this, ERDIP sought to explore issues around consent at several of its pilot sites and the final evaluation report of the programme (Foord et al 2003) draws two conclusions on this issue that should be examined. First, evidence from the pilot sites seems to suggest that it was not necessary to demonstrate that information is stored securely and is adequately protected from unauthorised access in order to gain patients' consent for their information to be used in the pilot (Foord et al 2003 p. 54). Patients seemed to simply trust that their information would be stored and used properly. Second, while recognising that explicit consent would be in some sense preferable, the pilots suggested that implied consent would be acceptable for most types of patients (Foord et al 2003 p. 78).

The Consumers' Association explored these issues further in two recent pieces of research for the NHS that cast some light on public attitudes towards greater use of ICT in the health service. The first, *Share with Care* (Consumers' Association 2002), explored general views on confidentiality of information while the second, more recent research (Consumers' Association 2003) looked specifically at the public's view on applications and services being developed under the aegis of NPfIT. However, the findings of both pieces of research tell the same story about the public's understanding of and attitudes towards the health service's use of patient information.

First, the public seems not to have a particularly well-developed understanding of the way that their information is used by the NHS at the moment. *Share with Care* explored this issue by asking respondents to suggest, unprompted rather than choosing from a list, the ways in which they think the health service uses information from their patient records. Almost one in

four of those asked reported that they did not know how their information was use at all. Around seven out of ten respondents were able to suggest that information in health records was used to treat patients but this was the only use of information that was mentioned by a majority of respondents. Fewer than one in ten respondents recognised that information in health records might be used by researchers to improve care, check the efficiency of the NHS or develop new treatments (Consumers' Association 2002 p. 18). The same research also showed that the public were not certain who could see their medical records and under what circumstances they were allowed to access them. While the public is so uncertain about the way that the NHS currently uses personal, health-related information it would be unwise to predict whether or not the introduction of EHRs, with their associated possible benefits and risks is likely to gain widespread public support.

Second, the public can imagine the benefits that might be delivered by new services such as EHRs or electronic booking of appointments. When presented with a list of the possible benefits of NHS CRS for themselves such as being able to check recent test results or look at their medical history, only seven per cent of respondents felt that none of the possible benefits would be important to them (Consumers' Association 2003 p. 28). This proportion dropped to three per cent when respondents were asked about the importance of possible benefits to those treating them, such as giving better access to their health records wherever and whenever they were treated. Similarly respondents generally agreed that they would find useful the possible benefits of the ability to book appointments or to transfer prescription information electronically.

Third however, while the public seem able to envisage the potential benefits of improved use of ICT in the same way, they also have questions about the security and privacy of their health information. When asked what questions they would like answered about the new system of electronic records, participants' responses indicate some concern about who would be able to see their personal information using new ICT systems. Around seven out of ten respondents said that they would want to know how secure the new system would be, who would have access to their personal details and how it would be ensured that nobody saw their personal details without their knowledge (Consumers' Association 2003 p. 40). Qualitative research conducted at the same time confirms both that the public have concerns about who can access their records and also that their understanding of how the health service currently uses patient records is not particularly well developed.

In an information brochure that it has produced for stakeholders (NHS 2004b) the NPfIT team have sought to address these issues. The brochure mentions consultation work that has been carried out over the past two years. As well as the research commissioned from the Consumers' Association on the services being developed through the national programme,



patient forums were also held in early 2003 (NHS 2003) and a broader consultation has taken place on the confidentiality and sharing of information (Department of Health 2003b; NHS 2002; NHSIA 2002a). A national Patient Advisory Board was also established in late 2003 to perform a role analogous to that of the National Clinical Advisory Board (Department of Health 2003m). It has since been disbanded and replaced by the Care Record Development Board.

The NPfIT brochure also sets out the broad approach to security that is being taken. Only people with specific authorisation will be able to update a patient's record and a complete audit trail will be created ensuring that it is possible to keep a record of everybody who accesses a record. In addition, it will be possible for patients to put some particularly sensitive information into a virtual envelope which could only be opened in specific conditions. The programme has chosen to share patients' information unless they specifically opt out. However, there is to be an awareness building campaign before any patients' information is shared to give those patients who wish to the opportunity to opt out, something which they could also do at any time later on (Parliamentary Office of Science and Technology 2004).

These measures are to be welcomed. In spite of them, however, it seems that there remains considerable potential for public disquiet about the use of personal information and this may present a considerable barrier to the delivery of the benefits that it is hoped will result from greater use of ICT in the NHS. While it is important to recognise that the current situation with paper records is not perfect, commentators and representative organisations have expressed some concerns about elements of the current approach being taken to security and consent.

The National Consumer Council, for example, has argued that personal information should only be shared where patients have given explicit consent for that to occur; that sharing should occur on an opt-in rather than an opt-out basis (Parliamentary Office of Science and Technology 2004). The final evaluation report from ERDIP also concludes that while implied consent may be acceptable to many patients, explicit consent remains 'better' (Foord et al 2003 p. 78). While adopting such an approach has implications in terms of the extra resources necessary to gain explicit consent (Singleton 2002 p. 11), doing so would reduce the risk of a patient backlash against the sharing of records as it would ensure patients had a more detailed understanding of the way that their information was being used. The contradiction between the principle of consent and that of 'need to know' as it is set out in the NHS draft information sharing charter has also been highlighted. Among other concerns set out in their response to the NHS Confidentiality consultation (Foundation for Information Policy Research 2003), the Foundation for Information Policy Research makes clear:

The legal and ethical basis of information sharing is not 'need to know' but consent. Need to know is something decided by administrators while consent is something given by the patient. If a patient has heart disease and prefers to keep this private, while a cardiology professor insists he has a 'need to know' so that he can claim his research data is unbiased, then under the 'need to know' doctrine the cardiologist will prevail. But under the law, and under medical ethics, it is the patient's prohibition that must prevail. (Foundation for Information Policy Research 2003 s. 18)

This is an important distinction given the low awareness among the public of the way that their information is currently used. It is that low level of awareness that currently presents a real problem in relation to how patients' personal information is used and so long as it persists, two problems will continue to be faced. First that it is impossible to have an informed public debate about whether the measures currently being taken to protect personal data are adequate. And second that individuals will be unable to make personal choices in relation to who sees their medical record, if at all. As is the case with professional involvement, it will take time before we can tell whether the patient and public involvement that has occurred as part of NPfIT thus far has been sufficient to inform a set of policies on information privacy and security that will be publicly acceptable. In the future, the planned public awareness raising exercises will be crucially important. The issue of organ retention has revealed the potential that the discovery of practices considered unacceptable by the public can have. If awareness of the use of personal information remains low, it is easy to imagine a similar public reaction around individual data privacy being sparked by one, well-publicised, unauthorised access to sensitive elements of an individual's health records.

Managing change throughout the NHS

As the sections above make clear, the simple delivery of hardware or software alone is unlikely to bring about an increase in public value. The maximum benefit from spending on new ICT will only be delivered if processes change to take full advantage of improved access to information. This change will mean new ways of working for many in the NHS and is likely to be challenging. There are two specific barriers to successful management of this change process worth highlighting. First, it remains unclear whether NHS ICT development ought to be more or less centrally controlled than it is at present. Second, it may prove that the NHS simply has insufficient capacity to engage with so large a change management programme.

Uncertainty over the appropriate level of central control

Derek Wanless made clear in his report to the Chancellor that he believed standards for NHS ICT were not being adequately set from the centre (Wanless 2002 p 101). This lack of central control, he argued, was leading to the development of a variety of incompatible systems throughout the health service. While many hospitals or GPs had ICT systems that were

useful internally, the benefits that might be delivered if these systems were able to communicate with each other were being missed.

The government's response to this criticism has been a dramatic centralisation of the formulation of ICT related policy in health and of the procurement of new ICT systems. Although in areas such as telemedicine much activity will continue to be locally inspired, the creation of the National Programme for IT in the NHS has meant much greater central control over the development of electronic patient records, systems for electronic appointment booking and prescribing and those for storing and moving medical images such as x-rays. Not only are standards for NHS ICT now being set centrally but new systems such as the NHS Care Records Service are also being procured centrally, leaving local NHS organisations with less ability than they had previously to independently determine their own ICT strategies.

This increase in the level of central control is particularly interesting given that in other areas of health policy the reverse process has been happening, with the intention being to devolve greater power to local organisations. Initiatives such as the development of foundation trusts and a new, more locally focussed approach to making changes in hospital services (Department of Health 2003e) are moving more decision making power to local NHS organisations. It remains to be seen whether these moves will be compatible with the centralisation of decision making over ICT. As use of ICT becomes increasingly important in the delivery of healthcare, nationally developed applications and services will need to remain flexible if they are not to impede the development of services that are informed by local priorities. While the establishment of good standards to ensure interoperability of systems across the NHS should not be criticised, two possible problems of the centralised solution currently being pursued can be highlighted.

First, it is unclear whether a single, centrally procured system can be sufficiently flexible to take account of the variety which exists within the health service. Many different ways of working will exist in different organisations and considerable care is necessary to ensure that positive practices are not inhibited by the delivery of new ICT equipment that may not be able to accommodate these differences. In the past, individual organisations have been able to procure systems individually and without always having to adhere to national standards, giving them the ability to buy ICT that catered specifically for their needs. However, this has caused the problem highlighted by Wanless: that the NHS now uses a large variety of incompatible ICT systems. The question to be answered is whether the new balance between national and local control is more appropriate.

Second, there is a danger that with a single, national implementation programme some organisations, which already use ICT in a relatively advanced way, may be held back. The strategy set out in *Information for Health* (NHS Executive 1998), while setting out a timetable for implementation, allowed local NHS organisations considerable leeway enabling some organisations to move ahead relatively rapidly. Concerns were raised during the procurement phase of NPfIT that some health service organisations were cancelling the procurements already underway in order to wait until contracts were awarded through the National Programme. The author of *Information for Health*, now the Chief Executive of a hospital trust, has also suggested that centralisation of control could potentially result in pioneering trusts being held back (E-Health Media 2003).

While it remains unclear whether the centralisation of decision making over NHS ICT will lead to these problems or not, it will be worthwhile remaining alert to that possibility. Given the problems that insufficient central control has caused in the past, it would be unfortunate if the reverse now proved to be the case.

Insufficient capacity within the NHS

The huge new spending on ICT systems for the NHS will clearly need to be accompanied by a similarly ambitious change management programme if it is to be successful. While the procurement of new systems has been managed centrally however, much of the change management will be the responsibility of local NHS organisations. It remains unclear at present whether there is the capacity within the health service for this task to be completed successfully. In particular we highlight three areas of concern: that managers within the health service might be focussed on other priorities, that the NHS may have too few skilled ICT professionals and that medical professionals may be unable to engage properly with the change management programme.

Management priorities

The introduction of new ICT systems is clearly now a priority for the NHS at a national level. However at a local level within the health service, where resources are limited, it remains to be seen whether there will be enough management capacity to carry forward the implementation phases of new projects.

A survey conducted by the NHS Confederation in late 2003 (Fereday 2004) evaluated the health service's readiness for NPfIT. The tone of the report was broadly positive, with nine out of ten responding organisations having a local management structure to deal with ICT and change management related to both e-booking and NCRS, two key elements of NPfIT. However that leaves one in ten organisations without an appropriate management structure and there must remain some concern about the level of preparedness of NHS organisations given that the survey was conducted at a time when the procurement phase of NPfIT was



already well advanced. In particular only 22% of responding organisations had completed an organisational readiness assessment for NPfIT. While almost half of respondents were conducting or planned to conduct such an assessment before spring 2004, over one in eight had no plans to do so. In both cases acute trusts were better prepared for NPfIT than other NHS organisations.

A more recent survey conducted during March and April 2004 (NOP 2004) also highlights a possible issue in relation to PCTs. Just half of the PCTs surveyed had an ICT Director in place and in almost every case the director responsible for ICT was either shared with other PCTs or ICT was only one of several responsibilities. Given the huge role of PCTs in delivering healthcare and the change management challenge presented by new ICT systems it is certainly possible that greater managerial resources will be necessary.

Finally, it is worth taking note of the fate of the NHS Modernisation Agency. Established in 2001 in order to support the modernisation process within the NHS, it now looks likely that the Agency will reduce in size with some of its staff redeploying to Strategic Health Authorities. With the Modernisation Agency having a key role in the process of change management associated with the NPfIT, it will be important to make certain that the support it was supposed to provide to NHS organisations remains available.

Too few skilled health informaticians

The introduction of a large number of new and complex ICT systems will require the NHS to have an appropriate number of people with the correct specialist skills if it is to be successful. Two problems have the potential to mean that future ICT projects founder because of a shortage of skilled ICT professionals.

First, there may simply be a numbers problem with too few people choosing to make their careers in health informatics. Health informatics professionals have not historically existed as a clearly recognisable group but the government's strategy paper (Department of Health 2002d) for this group estimated that there were around 20,000 people working in the health service with informatics as all or a major part of their role. This estimate has recently been revised upwards to somewhere between 60,000 and 80,000 people (E-Health Media 2004). Given that spending on ICT within the NHS is increasing rapidly it is unclear whether the existing informatics workforce will be adequate in number to deal with any extra workload. Any shortage in health informaticians might be further exacerbated by staff moving from the public to the private sectors as those firms involved in delivery of NPfIT increase their workforces. Retention of health informatics staff has been hampered by low status and poor career development (NHSIA 2001a). The launch of the UK Council for Health Informatics Professionals (UKchip) in March this year may help to resolve this problem. Initially

registration will be voluntary but it is expected that in time those working in health informatics within the NHS will have to be registered with UKchip. The likely positive impact of UKchip on the professional status of informatics professionals may be enhanced by closer collaboration between the Association for ICT Professionals in Health and Social Care (ASSIST) and the British Computer Society Health Forum (BCSHF), the two largest existing health informatics organisations.

The second historical problem in relation to health informatics professionals has been that skills levels were often unclear and no clear career progression or strategy existed to enable staff to develop the skills required by the NHS. Changes such as the launch of UKchip are likely to alleviate this problem but there have been other recent developments that are also helpful. The government's strategy as set out in *Making Information Count* aimed to ensure that the NHS had the 'right mix and numbers of HI [health informatics] staff in the right place at the right time' (Department of Health 2002d p 6). In order to ensure that the health service has the right staff, that informatics professionals are able to acquire the necessary skills and prove that they have them, a set of national occupational standards for the health informatics function has now been developed. This four level framework allows NHS staff to gain formal ICT and health related qualifications by studying at an approved educational institution or by taking a less academic planned continuous professional development route.

These changes are likely to improve the problems previously associated with health informatics professionals. However, given the massive increase in ICT related activity that is currently occurring, the government ought to remain aware that the ranks of ICT professionals may have to be further reinforced.

Inability to engage clinicians

If new ICT projects are to deliver the maximum public value, it will be crucial that the new systems are actually used by clinicians. It is therefore important to ensure that doctors, nurses and other health professionals are convinced of the value of new ICT services and are able to be fully involved in the change management process so that new systems work effectively. Our review of evaluation reports confirmed the importance of clinician involvement. For example, the success of trials exploring online GP appointment booking through digital television seemed to be dependent to some extent on the enthusiasm of the practice partners for the new system (Nicholas et al 2002 p93). The trials of electronic transmission of prescription information also highlighted the importance of clinician involvement in change management and suggested that barriers to their involvement could be overcome (Sugden 2003a p11). While we outlined potential barriers to effective clinical involvement in ICT related projects above, three are worth reiterating.

First, in some cases there may simply be a lack of enthusiasm among clinicians for the use of new technology. This need not be interpreted as luddism but could rather be a natural consequence of the paucity of evidence that ICT has previously contributed considerably to improving health or concern about the complexities of implementation. Fortunately at present it seems that clinicians are generally convinced of the potential benefits of better ICT use. Eighty per cent of doctors believe that NPfIT is an important priority for the NHS (Medix 2004) and seventy per cent of nurses believe that integrated electronic healthcare records specifically are a priority (Royal College of Nursing 2004). However, it is unclear how entrenched this support is and it will continue to be important to make the case publicly for spending on ICT where appropriate and using reliable evidence where possible.

Second, time pressures might simply prevent clinicians from starting to use new systems. The combination of high vacancy rates in some areas (Department of Health 2003c) and pressure to reduce the number of hours worked (Hutton 2003) means that clinicians have no spare time in their schedules. This means it is likely to be difficult for clinicians to start using new systems if doing so would slow them in their work for some initial learning period. The situation will be even more difficult if a new system delivered some benefit, for example more accurate and easily communicable patient information, but with the cost that the amount of time taken by clinicians to record that information was permanently increased.

Third, clinicians may not be able to engage properly with the change management process if their own ICT skills are inadequate. It is reassuring that levels of computer literacy among clinicians do seem to be rising (NHSIA 2002b). This is particularly welcome news given evidence that gaining familiarity with computers increases levels of enthusiasm about the introduction of new systems, particularly among those with very little previous computer experience. A recent survey showed that though only one in ten people with very basic knowledge of ICT felt positive about using new systems, this proportion increased to almost nine out of ten once they had completed a European Computer Driving Licence course (NHSIA 2004). Given the likely rapid increase in the importance of ICT in clinicians work over the coming years it will be important to maintain this increase in skill levels.

Conclusion

This chapter has outlined numerous barriers that we believe potential to prevent the delivery of public value by using ICT more effectively in health. Three points are worth noting in relation to these barriers. First, they are often interrelated and may reinforce. For example failure to involve clinicians, patients and the public is likely to impede the change management process. However, they may also counteract one another. Extensive involvement of clinicians, patients and the public is likely to be impeded by rapid procurement schedules. Second, it remains unclear what impact these barriers will have on projects



underway. However, they have all been problems for previous projects and it would be unwise to suggest that they will not recur. We should certainly expect at least some of them to pose problems in future given that they are not unique to the NHS or to the public sector, but have been and continue to be faced by many different organisations attempting to improve their use of technology. Finally, none of the barriers are insoluble and attempts to remedy them, as we outline in chapter six, are likely to go a long way towards ensuring that the necessary investment in ICT for the health service leads to real public value.

Chapter 6: Recommendations

While there is no crisis in the health related use of ICT, the previous two chapters have highlighted that there remains considerable room for improvement. Numerous problems prevent us from being able to demonstrate the considerable benefits that we would expect to have seen from spending on ICT, given the extent of the activity that has occurred. In this chapter we make recommendations that we believe would go some way towards alleviating those problems. Most recommendations apply equally to all information technology related projects in health but, given its importance, in certain areas we have made specific recommendations in relation to the National Programme for IT in the NHS (NPfIT).

Solving the evidence problem

The absence of a coherent body of evidence demonstrating that effective use of ICT in health can deliver real public value presents two serious problems. First, it may prevent the delivery of benefits in future projects as past mistakes are repeated. Second, it hampers public and political debate on the use of ICT, potentially preventing appropriate spending on ICT in the future. In this context it is important that evaluations of e-health projects capture evidence that enables us to both guide future decision making and demonstrate benefits where they have been delivered. Based in part on the shortcomings of some evaluations that we studied, we would set these broad guidelines for future evaluations.

Developing a clear rationale for evaluation

- Evaluation frameworks should be clearly linked to the aims of the project under examination. Where projects are expected to deliver certain benefits it is important that evaluations attempt to determine whether this has happened in practice.
- Business cases for future projects should consider what evaluation will be necessary to assess claims about likely costs and benefits that are made in those business cases.
- In developing new projects, thought must also be given to how the outcomes of evaluations of those projects will be disseminated in order to influence both future projects and public and political debate. In particular, the presumption should be that business cases and evaluation reports are automatically made public unless there are compelling reasons not to do so.

Ensuring adequate time and resources for evaluation

- The need for evaluation needs to be taken into account at the time a project is first considered. In particular:
 - There must be sufficient funding to enable the collection on the ground of detailed data on the performance of the project. The time pressures to which project managers are subject must be taken into consideration in order to ensure that

collecting information for evaluation purposes is not the first thing that is dropped from busy schedules.

- For large or particularly innovative projects where it is especially important that the outcomes of the project are known, there must be resources to enable the commissioning of external, independent evaluations.
- Evaluation timetables must be sufficiently flexible that unexpected changes in the progress of projects can be accommodated and valid conclusions can still be drawn.

Establishing baselines for comparison

- Data collected on ICT projects should aim to verify or reject the claims made on behalf of that project at its inception. While technical data may be important, effort should be made to collect data on outputs, such as the number of users of the system, and outcomes, such as changes in patients' health or satisfaction with services.
- Collection of this data must begin sufficiently early that baselines are established against which the success of the project can be judged.
- The potential of ICT in facilitating the collection of such data should be fully exploited. Not only might new ICT systems be used in the collection of information that would help to ascertain the usefulness of the systems themselves, they might also enable wider organisational, management and inspection functions.

Ensuring reliability and verifiability of evidence

- The provenance of all information quoted in evaluation reports must become clearer. Once collection of data improves, this should happen automatically as evaluation reports are based on more robust evidence.
- Particular care must be taken with the tone of evaluation reports and the formulation of conclusions. Both must be clearly in keeping with the available evidence.

Evaluation and NPfIT

- The Research and Development Director within the Department of Health should be given responsibility for co-ordination of evaluation of elements of NPfIT, examining its implementation in order to assess to what extent it is:
 - Delivering the expected benefits.
 - Being prevented from delivering benefits because of potential problems highlighted in this report or elsewhere.

Overcoming the barriers to success

In chapter five we identified several barriers to successful use of ICT. These barriers are not uniquely faced by the NHS but do seem to have hindered the successful implementation of

past ICT related projects in the health sector. We suggest guidelines here that, if followed, would help to overcome these barriers.

Funding ICT properly

In the past, funding for ICT projects seems to have been too low. The response to Wanless' report has been a large increase in spending on ICT. The challenge for the future, in the context of considerable competition for public resources, is to ensure that projects are given funding commensurate with the amount of public value that they are likely to deliver. In order that this is the case:

- Decisions over the funding of future ICT projects must take into account, so far as is possible given the scarcity of evidence, an estimate of the level of benefit likely to be delivered by those projects.
- Conduct as soon as possible the planned survey of local NHS ICT budgets in order to ascertain whether more funds are required, both in order to support the implementation of NPfIT and for other ICT related projects.
- Plans for all new projects should contain, as a matter of course, an assessment of the likely costs of implementation of that project as well as of the necessary hardware and software.

Procurement for public value

The procurement process undertaken by NPfIT has moved to the signing of contracts exceptionally rapidly and seems to have addressed many of the problems of ICT procurement that had been identified previously. However it is possible that there are further lessons to be learned. Therefore:

- Full and independent appraisal of the procurements conducted through NPfIT should be ensured, including consultation with local NHS organisations and private sector bidders in order to ensure that lessons are learned throughout the NHS.
- In particular, during future procurements there should be a presumption towards openness wherever possible. While there is a need to maintain commercial confidentiality in certain circumstances, there is also a need to provide information in order to facilitate debate about the systems being procured. Too often in the past documents that would have led to a productive discussion between stakeholders have not been available.
- Further innovative procurement methods should be explored. Recent fines of suppliers have highlighted NPfIT's use of payment schedules closely related to the delivery of appropriate systems but in future, if they have some control over implementation, suppliers might be paid more innovatively. Pilot projects could explore the possibility of

procuring for public value; making payments contingent on the delivery of real benefits to professionals or patients.

Involvement of users

Involvement of health professionals, the potential users of ICT systems, in the design and implementation of those systems has become a controversial issue for NPfIT. However, awareness of the importance of effective user involvement certainly predates NPfIT and has been noted in previous projects in the health service and throughout the public and private sectors. In relation to all ICT and health related projects:

- All projects should, as part of bids for funding, demonstrate that they have taken account of the need for user involvement and should address issues including:
 - Professionals' workload
 - Threats to professional roles and confidentiality
 - Ethical and legal concerns
- In addition, processes of user involvement should:
 - Aim to uncover other further potential barriers to the delivery of benefits associated with the use of new ICT systems.
 - Begin early so that users are not presented with new ICT systems as a fait accompli.
 - Be given equal importance as the timely delivery of hardware and software.
 - Be assessed as part of the process of evaluation.

NPfIT and user involvement

Although there is uncertainty about whether user involvement conducted as part of NPfIT has been sufficiently early and extensive, considerable effort now seem to be being made to gain clinicians' support for the programme. The appointment of the Deputy Chief Medical Officer to encourage greater clinical involvement is to be particularly welcomed. However, we have two specific recommendations in relation to NPfIT:

- Involvement mechanisms must be developed at both national and local levels with specific individuals recognised as *representatives* of clinicians and other staff. While the Deputy Chief Medical Officer commands the respect of clinicians it must be recognised that as joint Senior Responsible Owner for NPfIT, he has an advocacy role as well as a representative one and the two may not always be compatible. It is important that this distinction is recognised as the Care Record Development Board starts its work. Similarly at a local level, care must be taken with 'champions' who may not always represent the interests of all professionals.
- Given the benefits that it might deliver, implementation of NPfIT is important both morally and politically. However, the speed of the process should not be rigidly determined by

deadlines set in contracts or elsewhere. If some flexibility is permitted, if that is necessary to ensure proper involvement of clinicians, the resulting benefits are likely to be greater than if the process of implementation is rushed.

Ensuring patient and public acceptability

Making certain that new uses of ICT are acceptable to patients and the public is crucial in ensuring the delivery of public value. New products or services that do not have public support but are seen as, for example, being unethical or a waste of money inhibit the delivery of public value as they may considerably reduce patient and public satisfaction with services and lead to a decline in public trust in the health service. For this reason:

- All new projects should, as part of bids for funding, demonstrate that they have taken into account the acceptability to patients and the public of the service or product that is being proposed.
- Studies of patient and public attitudes to projects should be conducted as the project develops and should examine individuals' reactions to proposals both before and after projects' anticipated benefits and possible costs have been explained.

Patient and public acceptability of NPfIT

The awareness building campaign that will be held before patients' records are shared through NPfIT will be crucial in determining the level of support that it has among patients and the public.

- Patient groups must be fully involved in this process. Both independent organisations representing patients and bodies such as Patient and Public Involvement Forums will be crucial in ensuring that changes made as part of NPfIT are widely supported.
- If it were to become clear during the awareness building campaign that the current model of consent adopted by NPfIT is not acceptable to patients and the public then the possibility that a different model should be used *must* be considered.
- Support should be given to the Office of the Information Commissioner to conduct an audit of the data protection issues raised by NPfIT. This might involve the commissioning of independently conducted public involvement work to assess the acceptability of proposals to patients and the public.

Successful change management

Public value is unlikely to be delivered simply by the procurement of hardware and software but is likely to depend on successful management of positive change that is facilitated by that technology. In the past however, projects have simply bolted on new technology without paying sufficient attention to change management. In order to avoid the suboptimal outcomes that are likely to be the result of ignoring the need to manage change effectively:

- Given that the level of success of NPfIT is yet to be determined so, in the case of future projects, while ensuring centrally set standards, decisions about the appropriate level of central control over procurement and implementation must be made on a case by case basis.
- All projects must ensure, as part of bids for funding, that sufficient capacity exists to accommodate the change management processes associated with the introduction of new ICT systems. In particular this should include:
 - An assessment of the likely needs in terms of time and skills for clinicians, managers, patients, those with specialist ICT skills and others.
 - An estimate of the likely cost of the change process, to be taken into account alongside the cost of hardware and software when decisions about the project are being made.

Change management and NPfIT

As the procurement phase of NPfIT has concluded, attention has naturally shifted to the challenges of implementation. In relation to change management and NPfIT we have just one recommendation:

- Sufficient funding and support must be made available to local NHS organisations to enable change management associated with NPfIT. The information needs that NPfIT aims to meet are important and, having decided to make huge investment on ICT centrally, it is now crucial that implementation is supported locally if the potential benefits are to be delivered in full.

Conclusion

Few of the problems with evaluation and the barriers to successful use of ICT that are identified in chapters four and five are new. Rather they have been encountered repeatedly both within the health service, the wider public sector and beyond. In spite of this, they seem to recur and ICT projects are seen to have failed. However, this is not a reason to reject the use of ICT. Rather, given the potential benefits presented by new technology, and in the context of a highly important and visible programme of spending, it is a reason to redouble efforts to use ICT effectively. These recommendations are made in order that old barriers can be overcome and improved use of ICT can deliver greater public value: better services, better outcomes and an NHS that continues to retain the trust of citizens.

Appendix A: Major contracts awarded through NPfIT

Contract	Value (£m)	Awarded to	Date announced
NHS Care Records Service (NHS CRS) National Application Service Provider	620	BT	08/12/03
NHS CRS Local Service Provider (LSP) London region	996	BT	08/12/03
NHS CRS LSP North East region	1099	Accenture	08/12/03
NHS CRS LSP North West and West Midlands region	973	CSC	23/12/03
NHS CRS LSP Eastern region	934	Accenture	23/12/03
NHS CRS LSP Southern region	896	The Fujitsu Alliance	26/01/04
National Electronic Booking System	64.5	SchlumbergerSema (now Atos Origin)	08/10/03
New National Network (N3)	530 (est.)	BT	19/02/04

Appendix B: The role of broadband

Broadband connectivity for 10,000 NHS organisations is currently provided through NHSNet, access to which is possible at various data rates. In his speech at the e-Summit, the Prime Minister promised broadband connections to “every GP surgery, every hospital and Primary Care Trust in the country” (Blair 2002). This promise is now being fulfilled through the delivery of the New National Network (N3).

The contract to deliver N3 was awarded to BT in February 2004 and will give broadband access to all 18,000 NHS sites. Specifically, typical speeds of access will be:

- between 512Kbps and 1Mbps for a GP practice;
- 100Mbps for an acute hospital; and
- 10Mbps for a community hospital and PCT.

With the N3 contract being worth an estimated £530m over seven years, it is worth asking what it is likely to deliver in terms of benefits over that period. Given the emphasis on speed in much of the consumer advertising for broadband, it is tempting to think only of the benefits that might be delivered through applications like teleconsulting which are reliant on rich content such as video. However, applications such as those enabling online booking of appointments, which may not use rich content but will still necessitate the transfer of vast amounts of information, will also require access to a fast and reliable network. In this context it does not make sense to try separate out the specific impact of broadband in health from the impact of ICT more widely. Rather it is more sensible to recognise that the vast majority of the ICT and health related products and services developed in future are likely to be reliant, at least in part, on good access to broadband.

Given the paucity of evidence that currently exists in relation to ICT and health more broadly, it is difficult to argue that benefits delivered through the use of N3 definitely outweigh the cost of its procurement. What it is possible to say however is that without N3, applications such as electronic patient records, which aim to meet the genuine information needs of the health service, would be considerably less likely to be useful.

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