Information and Communications Technologies in Public Health
Tackling Health & Digital Inequalities in the Information Age

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Good information and communications are vital elements in public health practice. Information underpins the assessment of health needs, the development of health strategy and the monitoring of progress. Equally, communications provide the essential links for consultation, discussion and dissemination of knowledge between health professionals, other individuals and organisations affecting health and the general public. The quality of both information and communications is now more than ever linked with the effective and appropriate use of technology. The past twenty years have seen an Information and Communications Technology (ICT) revolution offering faster and more varied methods for communicating (e.g. e-mail, video-conferencing and mobile telecommunications), near instant access to vast amounts of information (e.g. through the Internet) and the emergence of new forms of inequality (e.g. the Digital Divide). Consequently for public health, ICTs present both developmental opportunities and new challenges to equity. This report identifies many existing inequalities in ICT access and aims to provide health professionals with some of the background knowledge necessary to exploit ICTs to improve public health without increasing inequalities or encouraging social exclusion.

Utilised properly new technologies can offer public health rapid access to:

- key data at all levels from international to local (see Section 3.5);
- networks of professionals in health and related disciplines (see Section 3.14);
- the public’s views on health service development (see Section 2.6) and;
- electronic libraries of evidence, peer reviewed research and practice guidance (see Section 3.4).

Furthermore, e-mail, digital TV and mobile phones can allow information on health to be disseminated faster and more efficiently; in some cases to wider populations (e.g. health information on digital TV; see Section 2.8) and in others specifically to individuals with particular health needs (e.g. phone messages to those wishing to stop smoking; see Section 4.3.7). The same technologies can bring members of the public together to discuss common health problems, provide anonymous advice when people prefer not to see a clinician, and connect remote (e.g. rural) or sometimes excluded (e.g. ethnic populations) communities to services and friends (see Section 4.2). Importantly, new technologies offer opportunities for socially excluded groups to access better education (see Section 2.3), for disabled people to improve their quality of life (see Section 4.3.4) and for clinical services to be delivered more efficiently often within the patient’s home (i.e. telemedicine; see Section 5.5). However, utilising ICTs for these purposes requires new skills and knowledge within public health.

In order to disseminate public health information through ICTs an understanding of who can and who cannot access each technology is paramount. Across different health professions essential computer skills and ICT access are far from universal (see Section 2.7) and time and investment is required to ensure NHS staff have the skills required to handle information successfully. Equally across the population, Internet access is widespread in some groups (e.g. younger and more affluent groups; see Section 1.5) but poorly developed in others (e.g. older people and poorer communities). However, communities with poor computer access may have other mechanisms to access the Internet such as digital TV (see Section 1.9). Public health interventions risk missing key groups if they rely on a single technology (such as
computers) and ignore other mechanisms with which they may be less familiar (e.g. digital TV). Currently, most health websites are not designed to be accessed through digital TV despite appropriate development guidelines being available (see Section 5.2).

The challenges to public health posed by the digital divide are likely to increase as NHS policy moves towards a greater reliance of ICT to deliver: freer access to personal health records for individuals, general health care information for the population and in some cases health care itself\(^2\,^3\,^4\,^5\). Consideration of which communities are well placed and which are poorly equipped to exploit these new opportunities is a public health issue and one that, if ignored, will leave those who most rely on the NHS least able to access it.

Trying to engage groups who have poor computer access through the Internet requires new partnerships. Nationally, initiatives such as Digital Neighbourhoods (see Section 1.8.1), Wired Up Communities (see Section 2.2.1) and UK Online (see Section 2.2) all aim to increase the uptake of new technologies across the UK. More specifically, some specialist services provide advice on developing web content for different groups (e.g. Age Concern; see Section 4.3.2), tools for helping to access different communities (e.g. ethnic minorities, MyPil.com; see Section 4.3.1) and methods for disadvantaged groups without personal Internet access to surf the web (e.g. YouthNet UK; see Section 4.3.3). Public health specialists and others must now be familiar with and be part of efforts to familiarise all communities with new technologies.

More generally, when developing any Internet resource basic guidelines are available to: encourage consistency in design and information provision (see Sections 6.1 to 6.4), improve security (see Section 6.6.5), monitor performance (see Section 6.6.7) and ensure that as many people as possible (regardless of disability) can access the site (see Section 6.5). Often health sites do not utilise such advice. Furthermore, even when sites are appropriately designed they may fail to reach their desired audience due to low visibility on the web (see Section 6.6.3) or poor advertising.

As well as using ICTs to provide information, public health must face the new challenges posed by knowledge retrieval and management. Dealing with information overload, determining information quality and extracting appropriate knowledge from sometimes thousands of web pages are all skills necessary for effective ICT use. At their most basic these processes require health professionals to have basic computer skills. New initiatives such as the NHS University (see Section 2.7) aim to fill existing, significant skill gaps throughout health personnel. Resources such as general and health specific search engines (see Section 3.13) are available to aid information location but reveal little about the quality of data or intelligence on any website. More specifically key organisations aim to provide quality-approved information including public health evidence (Health Development Agency; see Section 3.4), general health and specific public health intelligence (National Electronic Library for Health; see Section 2.8.4) and regional public health knowledge (Public Health Observatories; see Section 3.3). Other tools are also available to judge the content of any health site (e.g. Discern; see Section 6.6.8) although these are still in their developmental stages.
These new challenges for public health are vast. As a resource for those working in Primary Care Trusts or working elsewhere with public health and ICTs, the following report has been developed to help identify: who can be reached through existing ICT structures, recent development in new technologies available to public health, the strategies and organisations responsible for their development and, where possible, what might be expected as a result of ICT development over the coming years.

1 NHS Information Authority (2001). National Health Informatics Competency: Annual Survey. NHS Information Authority: Winchester
2 Secretary of State for Health (2002). Delivering the NHS Plan: Next steps on investment, next steps on reform. Cm 5503
4 Secretary of State for Health (2000). The NHS Plan: a plan for investment, a plan for reform. Cm 4818-I

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Executive Summary

Chapter One

Content – An Introduction to Information and Communications Technologies provides basic information on ICTs including: levels of ICT access in the UK, demographics of ICT users, common uses of ICTs and methods of accessing the Internet. It describes geographical, age, sex and income related variations in home Internet access and looks at reasons why individuals have not yet accessed the Internet. As well as personal use statistics, current levels of Internet access among medium and small businesses and more specifically among health professionals are included. Access to and use of other new technologies are also described including digital TV and mobile phones.

Summary - Variations in home Internet access for personal use reveal higher levels of ICT use among younger, less disadvantaged groups with higher levels of household access in and around London (see Section 1.5). Among those who have never used the Internet, reasons include lack of interest or perceived need and lack of access or skill. For those who use ICTs, the most popular uses are for email and educational purposes with, for instance, over half of young users utilising the Internet for help with homework (see Section 1.7). In addition to home use, 90% of UK employees work in businesses with Internet access, although how free they are to use the Internet at work varies. Internet use is also increasing among health professionals with 97% of GP Practices having Internet connection through NHSnet (see Section 1.8). As Internet use by GPs grows, so does their propensity to refer patients to useful websites (e.g. NHS Direct) for health information.

The distribution of digital TV and mobile phones across social categories is less income-related than computer Internet access. Although both technologies offer the potential for Internet access, their use to access online services is currently limited. Almost half (44%) of adults in the UK report having digital TV at home. However, with TV usually located in communal areas and few websites currently functioning through this medium, Internet access and email facilities are rarely used through digital TV (see Section 1.9.1). Mobile phones are now owned by around 75% of UK adults and are used to send 30 million text messages in the UK every day. While growing numbers of mobile phones provide some level of Internet access, only a few online services are available through mobiles and data transfer speeds are very slow. Thus, only 6% of mobile phone users have used their phones to access the Internet (see Section 1.9.2). Although developments in mobile technology should make online services more accessible, the initial high costs of new technologies means income factors are likely to prevent use by the least well off, presenting new challenges for public health initiatives wishing to utilise this technology for tackling ill health.
Chapter Two

Content – National Initiatives for Information and Communications Technologies explores the range of health and other strategies implemented in UK to increase use of ICTs (particularly the Internet) and to build capacity in ICT skills. The government’s UK Online strategy to develop the use of ICTs is outlined. Other initiatives summarised include: Wired Up Communities which delivers ICT in deprived areas (see Section 2.2.1); schemes to provide Internet access to schools and teachers (see Section 2.2.3) and developments such as Broadband Britain. More specifically, details are provided of selected ICT initiatives for health (see Section 2.6), including plans for ICT developments in the NHS (e.g. Information for Health: An Information Strategy for the Modern NHS), modernising health delivery (The NHS Plan) and developing staff skills (Together with Health Education – A Partnership Strategy for Education, Training and Development). Chapter Two concludes by outlining some of the major NHS facilities (e.g. NHSnet; see Section 2.8.1), web resources (e.g. nhs.uk and NHS Direct) and organisations (e.g. NHS Information Authority and NHS Information Policy Unit) that are available to lead and assist in the development of health resources and communications on the Internet.

Summary - The government’s UK Online strategy aims to create opportunities for all UK residents to connect to the Internet, to encourage businesses to adopt ICTs and undertake online business transactions, and to move government services online (see Section 2.2). Importantly, providing access alone will not necessarily result in uptake of Internet use. Thus, a General Practice that provided Internet access for patients within the surgery found only nine of 13,000 used the service over three months; all of whom had accessed the Internet before (see Section 2.3). Critically, plans for public involvement in NHS development (see Section 2.6) often involve communications between public and professionals through new technologies. However, current demographics of Internet access mean that such communications would exclude those with the greatest health problems.

At the centre of online health advice for the public is NHS Direct which already receives over four million visits every month (see Section 2.8.3) while at the centre of professional health information will be the National Electronic Library for Health (NeLH) and, for public health, its branch the Public Health electronic Library (PHeL). Used properly, such national resources should be a critical component in local intelligence. Local web developments are also essential and should complement (not replicate) national resources by sign-posing users to key national sites as well as providing specific information pertinent to a particular locality, network or target group. Information on developing local web sites is briefly reviewed in Chapter Two but expanded upon in Chapter Six. Finally, not all Internet initiatives are accessed through computers, and services such as Living Health aim to provide health information through digital TV as well as the ability to speak to nurses, book GP appointments and watch educational video clips (see Section 2.8.3).
Chapter Three

Content – The Professional Web: Online Public Health outlines some of the major benefits and uses of ICTs for public health professionals. It provides a basic introduction to many available online information sources including national public health sites (e.g. Public Health electronic Library, Public Health Observatories) catalogues and databases of online resources (e.g. the Health Development Agency’s Evidence Base and the National Institute for Clinical Evidence), and public health data sources (e.g. Department of Health, Office for National Statistics). Alongside these information sources are a vast range of additional resources including search engines, voluntary organisation sites and commercial media resources (especially the BBC and newspapers). The Chapter concludes by briefly reviewing the application of online resources and new technologies in building public health networks.

Summary - Many of the resources (outlined in this Chapter) provide direct access to quality public health information. Furthermore, they also help the professional identify what other information exists, where it can be accessed and, can help ascertain information quality and therefore the confidence that can be placed in a resource. Public health professionals or others need to be aware of the key online resources available to them to help improve health in their local populations (see Section 3.15). One particularly important new online development for Primary Care Trusts is the Neighbourhood Statistics service, developed to meet the information needs of the National Strategy of Neighbourhood Renewal (see Section 3.5.2). It aims to provide information at small geographical levels. Equally, in line with increasing use of the web to distribute new data, the 2001 Census will be free and unrestricted and will largely be provided electronically through the Census Access project (see Section 3.5.2). Some resources, such as NCHOD (National Centre for Health Outcomes Development; a knowledge base on the assessment of health and health outcomes interventions) are currently only available on NHSnet but should be more widely available in the near future (see Section 3.5.4).

With a huge amount of new information becoming available on a daily basis, ICTs can help professionals to manage what has become known as the ‘information overload’. Useful tools available include e-mail alerts that automatically inform subscribers when new, relevant information is available (e.g. 10 Downing Street and Info4Local; see Section 3.7). For professionals, the potential for such services is not limited to national schemes - local versions could play a part in sending relevant information out to key patients or communities on issues that affect them. At both local and national levels recognition of the opportunities presented by ICTs for communication and dissemination of information is resulting in the development of public health networks. These aim to provide the structure necessary to encourage and enable the exchange of information and knowledge between professionals and organisations for common benefit (see Section 3.14).
Chapter Four

Content - Matching Health Needs to Internet Access: Using ICTs to Reach Communities describes some of the existing and developing uses of ICTs by the public for health purposes. The Chapter looks at the potential of ICTs (and particularly the Internet) for reaching different health populations (ethnic minorities, older people, young people and disabled people) and for addressing selected public health issues (sexual health, diabetes, mental health and smoking).

Summary - Already the potential for delivering health information through the Internet is immense with over 100,000 health related sites available and over half of all UK Internet users having accessed health information through the Web (see Section 4.2). However, the effectiveness of the Internet depends on access and the web skills of the group being targeted. Relying only on new technologies can exclude significant numbers of people who often have the greatest needs. Thus, ethnic minorities have much to gain through the Internet including skills development, promotion of equal opportunities and the ability to access specific cultural information. However, they are also more likely to live in socially disadvantaged communities and consequently less likely to have access to new technologies (see Section 4.3.1). Even when access is possible health information on the web is usually in English. Older people suffer from a similar combination of high potential gains from new technologies combined with generally poor levels of access and skills. However, initiatives such as Age Resource (a division of Age Concern) encourage older people to become involved with ICTs and provide access to computers and training. How effective the Internet is as a medium for addressing specific health issues varies across health conditions. Sexual health for instance is a private matter individuals may prefer to explore alone through the Internet (see Section 4.3.5). Good sexual health information is highly pertinent to young people and as young people are high Internet users (see Section 4.3.3) the Web can provide an appropriate medium for delivery. However, filters meant to protect the young from pornography can also prevent users accessing genuine sexual health sites (see Section 4.3.5).

The Internet allows members of the public to learn from each other. For example a review of diabetes ICT initiatives identified how discussion groups are well used by friends and relatives as well as patients and how after participating in online discussion 80% thought they had improved their ability to deal with condition (see Section 4.3.6). Across all conditions, common lessons include the importance of considering both levels of access among the target audience and the appropriateness of ICTs for dealing with each particular health issue. Any ICT initiative should ensure alternative methods of accessing information are available to those individuals without ICT access.
Chapter Five

Content – Preparing for the Future looks at new and emerging technologies and their potential impacts on society in general and on public health in particular. Digital TV and broadband are discussed as new technologies that are becoming increasingly popular in the UK, whilst 3G (third generation) mobile is outlined as an emerging technology which may become widely used in the future. The Chapter discusses current and potential uses, likely diffusion, and possible benefits and challenges to public health of each technology.

Summary - Digital TV has the potential to provide all members of society with easy access to online services and a national switch to digital should occur by 2010; making analogue a thing of the past (see Section 5.2). Already use of digital TV is more equally distributed across social groups than other new technologies (see Section 1.8.1). At present however, use of digital TV for accessing the Internet and sending emails is low (10% and 15% of users respectively) with TV use being regarded as a social activity inappropriate for personal Internet use (see Section 5.2). In addition, most websites are not designed for this medium and hence do not function properly on digital TV despite guidelines on creating digital sites being available (see Section 5.2).

Broadband makes the use of online services much faster and by ending the ‘World Wide Wait’ should encourage greater use of the Internet. The rapid data transfer speeds also enable use of video-conferencing facilities (see Section 5.3), which could aid communications in, for example, rural populations and ease remote access to health services. Broadband has been slow to take off in the UK due to high costs and lack of access, but is now becoming more widely used. However, it is not yet available universally and although rural populations may stand to benefit most they may also be last to receive such services. Emerging technologies such as 3G (see Section 5.4) combine broadband and mobile technology, allowing users to access online services wherever they are. One major benefit of mobile technologies is the opportunity they provide for contacting people quickly. However, rapid developments in technology and the ease with which users switch between suppliers means contact details often become quickly obsolete, making patient follow up and maintenance of contact information more problematic.

All the technologies discussed in this chapter have potential to impact positively on society and provide particular benefits to public health. Equally however, they also have the potential to increase inequalities and to further marginalise deprived populations. Initial access to new technologies will always be unequal and the benefits to public health for some must be weighed against the marginalisation of others.
Chapter Six

Content – Creating Web Pages provides basic advice on the development of web content, outlining official guidelines for government websites (see Section 6.2) and NHS organisations (NHS Identity Guidelines, see Section 6.3), as well as providing more general guidelines covering issues such as design, layout, and writing styles. A further section is devoted to usability and accessibility issues. Finally, the chapter outlines a range of other important issues surrounding web development including security, promotion and advertising, data standards, and monitoring and evaluation.

Summary - Numerous resources are available to assist web developers in creating appropriate, useful and accessible websites, such as the Handy Web Tools section on the Health Promotion England website (see Section 6.1). Guidelines for government websites are based around ten key principles and importantly acknowledge the need to develop content to be accessible over a range of different platforms including digital TV and mobile devices. NHS guidelines include information on usability issues to ensure that NHS sites can be used by as many people as possible. Individuals and groups such as the elderly and those with disabilities should not unnecessarily be excluded from accessing online information through poor design. Several resources are available for creating accessible websites (e.g. World Wide Web Consortium Web Accessibility Guidelines, see Section 6.5), while organisations such as the Royal National Institute for the Blind and Age Concern have developed guidelines for making sites accessible to specific populations.

No matter how well designed a website is, effective advertising and promotion is essential to raise awareness of it amongst the target audience (see Section 6.6.3). Other issues also determine how well ICT initiatives deliver on their objectives. Whether a site is developed internally or externally will impact both on the cost of development and maintenance of the site and on the ease with which information is added, amended and secured (see Section 6.6.2). Security is a major issue for any project, but is critically important for health organisations that deal with electronic storage and transfer of confidential information (see Section 6.6.5). Equally, links from NHS to other sites can be seen as a stamp of NHS quality and vetting for quality and appropriateness should be encouraged before links are established. A number of resources have been developed to help ascertain the quality of information, including an online version of Discern (see Section 6.6.8). Often however, such aids to determining quality are themselves incomplete and of questionable value. The World Health Organisation is currently campaigning for the creation of a ‘.health’ domain name which should help professionals and consumers alike identify legitimate health sites.
Chapter 1

An Introduction to Information and Communications Technologies (ICTs)

1.1 Introduction

Information and Communications Technologies (ICTs) are becoming an integral part of modern-day society and for many the Internet is increasingly a part of everyday life. Anyone with access to the necessary technology can use the Internet to purchase goods, conduct banking transactions, find information on almost any subject, access government services, have a ‘conversation’ with someone on the other side of the world and much, much more. Parts of the health sector have also begun to embrace ICTs. Many health organisations already have their own websites providing information to both professionals and the public, and ICTs are already being used for the dissemination of public health information and for health promotion purposes. However, as organisations are swept along by this information revolution, there is little time for health professionals to sit back and consider what these new technologies actually are, which organisations, communities or individuals are able to use them, and how they are being used. For the individual, a lack of understanding of ICT issues can be confusing. For organisations using ICTs for health purposes, a lack of knowledge of who uses ICT and how it is used can lead to inappropriate initiatives. In some cases it may even serve to increase inequalities in health by excluding individuals, groups or communities that cannot access important information through the Internet and email.

This report aims to provide some of the necessary background for health organisations (in particular Primary Care Trusts) to recognise when and how ICTs can be best utilised to:

- Disseminate and acquire public health knowledge
- Develop networks and
- Enhance communications between professionals and the public.

To aid interpretation of the rest of the report, this chapter provides basic information on ICTs including: levels of ICT access in the UK, demographics of ICT users, what ICTs are most commonly used for and methods of accessing the Internet. For ease of use, throughout the report additional information (sometimes of a technical nature) is provided in boxes.

1.2 What are Information and Communications Technologies (ICTs)?

Information and Communications Technologies have been defined as “any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form”\(^1\). These include telecommunications, computers and broadcasting technology. All these are becoming increasingly analogous due to technological advances and the use of a common digital language\(^2\). Instead of performing separate functions, such as broadcasting in the case of television and voice communication in the case of telephone, it is now becoming possible for any one technology to perform the functions of several others. For example, digital television and mobile phones can...
now be used to access the Internet and send e-mail as well as for their traditional uses, whilst television broadcasts can be watched on some personal computers (PCs).

A major use of ICTs is to gain access to the Internet, most popularly to send e-mails (Box 1.1) and to find information on the World Wide Web (Box 1.2). The range of activities that can be undertaken on the Internet is continuously growing. For example it is now possible to purchase the weekly shopping, book a holiday, and even study for a university degree through the Internet often without leaving the comfort of your own home. Even government services are moving online, with the government having pledged to ensure that all its services will be accessible via the Internet by 2005.

Internet access has traditionally been achieved through a computer, and computers are still the most popular way of getting online. However, in recent years new Internet-access devices have been developed, including digital TV, mobile phone and gaming consoles. This is making connection to the Internet and electronic communications more convenient and is also reducing to some extent the cost barrier associated with the Internet. Thus, people no longer have to invest in expensive computer equipment to gain access to the Internet. As new technologies make the Internet more accessible and people experience the convenience of online transactions, the Internet will inevitably become more and more an integral part of our society, being used by ever widening groups (See Section 1.9 and Chapter 5).

1.3 What is the Internet?

The Internet is an international network of computer networks – hence the name ‘inter’ from international and ‘net’ from network. These networks use a common language and addressing system which allows them to communicate and share data, files and other information. At the centre of the Internet is a network of high-speed computers permanently connected to each other. In order to access the Internet, individuals connect their computer (or Internet-able device) to one of these high-speed computers using an Internet Service Provider (e.g. America Online (AOL); Blue Yonder). Once connected to the Internet (online) they can access information from billions of ‘pages’ of information posted on the Internet from all over the world. Access to the Internet allows users to send electronic mail (e-mail: see Box 1.1), find documents on the World Wide Web (see Box 1.2), ‘meet’ and ‘talk’ to people electronically in chatrooms and much more. A short history of the Internet is given in Appendix 1.

1.4 Who uses ICTs?

ICT use is steadily increasing throughout the UK, although at present the penetration of ICTs throughout the population is by no means equal. The gap between groups with access to ICTs and the Internet and those without is commonly known as the digital divide (see Box 1.3). Wider public access to ICTs is becoming available through locations such as public libraries and community centres, although public access cannot equate to the convenience of home access and may not promote universal use. ICTs such as digital TV and mobile phones, which are increasingly being used to access the Internet and email, could have a favourable impact on the digital divide (see Section 1.9).
Box 1.1: E-mail

Electronic mail, or e-mail, is a way of sending text files from one computer to another via the Internet⁵. E-mail has been described as the ‘killer application’ of the Internet – the function that initially made the Internet so popular⁷. The first e-mail was sent in 1971 – today, an estimated 10 billion e-mails are sent globally every day⁸. To send and receive e-mail a person must have an e-mail address and a mailbox on a server computer. An e-mail address is made up of a person’s ‘username’ (or the name of a person’s mailbox) and the ‘domain’ name of the server computer⁶. The @ sign separates the two names. For example:

Mailbox name  ➔  john@yahoo.co.uk  ←  Domain name

In general, ‘co.uk’ indicates that yahoo is a company (.co) based in the UK (.uk), although there will be exceptions to this rule. Other types of domain name include:

- .gov.uk  A UK government address
- .ac.uk  An academic institution in the UK
- .nhs.uk  An NHS address

Today, e-mails are still basic text files although they now can carry other types of files such as graphics or spreadsheets as ‘attachments’.

Box 1.2: The World Wide Web

The World Wide Web, also known as WWW, W3 or just the Web, is basically a huge international collection of documents on the Internet⁹. Before the Web was developed, finding information on the Internet required a knowledge of computer languages and a significant amount of technical expertise⁷. Fortunately, the Web adopted a uniform language (HTML; Hypertext Mark-up Language) and addressing system (URL; Uniform Resource Locator), that allowed different computers to understand each other and communicate easily. The URL, or Web address, of information on the Web consists of ‘www’ (indicating a World Wide Web address) and the domain name of the computer the information is held on. The Department of Health’s Web address, for example, is www.doh.gov.uk, which tells us that ‘doh’ is a website of the UK government.

Information on the Web is organised into ‘pages’, each of which has its own individual address. This address takes the user to the exact file on the server computer containing the information for that page. The executive summary for the White Paper, Saving Lives: Our Healthier Nation, for example, can be found at:

http://www.doh.gov.uk/ohn/execsum.htm

This tells the user that the executive summary is located in a file named ‘execsum.htm’ in the directory ‘ohn’ on the computer which hosting the Department of Health website.

Web pages can contain text, pictures, sounds, forms, animation and, most importantly, ‘links’ to other web pages. Known as hypertext, these links (traditionally shown on screen as underscored text in a different colour from the main text), allow users to jump from web page to web page by simply pointing and clicking with a mouse. The World Wide Web made the Internet accessible to even the most inexperienced computer user, and there are now estimated to be over 1 billion ‘pages’ on the World Wide Web, with more being added daily¹⁰.
The digital divide refers to “the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communications technologies (ICTs) and to their use of the Internet for a wide variety of activities”11. Levels of access to ICTs in the UK, as elsewhere, are highly unequal with ICT use being lowest amongst the least well off and most socially disadvantaged populations. Home Internet access in the UK is seven times higher in the highest income households than in the lowest income households4, whilst almost nine out of ten households headed by someone in a higher professional occupation have Internet access compared to just two out of ten headed by someone in a routine occupation**. Individuals that are excluded from ICTs are automatically excluded from the opportunities they bring, such as the ability to: increase knowledge and skills; improve individual health by increasing participation in personal healthcare; increase social interactions; to improve employment opportunities and; undertake online purchases and transactions quickly and cost-effectively. The lack of ability to participate in such online activities only serves to further increase the gap between the ‘haves’ and the ‘have-nots’12. Recognition of the importance of equality of access to ICTs and the Internet has made reducing the digital divide a major governmental objective. To ensure that inequalities in health are not worsened, the reduction, and ideally elimination of the digital divide should also become a major priority to health organisations which are increasingly using ICTs for the dissemination of public health information.

* The National Statistics Socio-Economic Classification ‘routine occupation’ covers “positions where employees are engaged in routine occupations which have a basic labour contract”, including routine sales and service, production, technical, operative and agricultural jobs.

In order that ICTs are used effectively for the dissemination of public health information and for health promotion, there must be an understanding of levels of access to ICTs and particularly the Internet throughout different population groups.

### 1.5 Internet Access

It is impossible to know exactly how many people in the UK are using the Internet. Registration figures from Internet Service Providers (ISPs) can provide an indication of the number of Internet users, although registration is constantly changing as people switch between providers to find better deals. Furthermore, many individuals access the Internet from work, at friends’ houses, at school or in public access points and are not registered by ISPs. According to the National Statistics Omnibus Survey, over half (56%) of all adults in Great Britain have used the Internet, equivalent to around 25.6 million adults4. An estimated 9.8 million households in the UK currently have Internet access, a figure which has increased from just 2.2 million households in 1998 (see Figure 1.1). The dramatic increase over the last few years has been helped along by the introduction of free ISPs in 1998. Over one third (35%) of individuals who use the Internet are thought to be using it on a daily basis13.

Many individuals who use the Internet do so from their own homes using a personal computer (PC). This is currently the main method of connecting to the Internet, with 98% of Internet users having connected to the Internet via PC. However, the percentage of Internet users going online using other technology is increasing – by February 2002, 9% of users had accessed the Internet through a mobile phone and 6% through digital TV4. The number getting online via digital TV and mobile phone is likely to increase as these alternative methods become more accessible to the general population. Current penetration of digital TV and mobile phones is outlined in Section 1.9. It has been estimated that by 2005, 60% of Internet users will be using mobile devices to connect to the Internet14.
1.6 Demographics of Internet users

1.6.1 Gender and Age
Over half (56%) of all adults in Great Britain have accessed the Internet at some time in their lives. Slightly more men (58%) than women (54%) have used the Internet, although the gender difference is now much less than in the past. Use of the Internet varies greatly between age groups with 82% of 16-24 year olds having accessed the Internet compared to just 12% of individuals aged 65 and over (see Figure 1.2). As the Internet has only become readily available to the general population within the last decade, this is not particularly surprising. Many young people will have accessed the Internet at school and university or in work, and young people in general tend to be more interested in new technologies. Older people may never have come into contact with this technology, possibly having retired before it became widely used. However, between October 2000 and March 2001 Internet use by those aged 65 and over is thought to have increased by 34%. Age differences between Internet users should reduce with time – for example, as the high proportion of young people using the Internet today (82%) progress into older age groups, Internet use will inevitably increase in these older groups.

Fig 1.1: Number of UK households with access to the Internet (millions)
Fig 1.2: Adults who have used the Internet by age group, February 2002

The use of the Internet among children has increased rapidly over the last few years. In the six months to April 2001, the number of 7 to 16 year olds having used the Internet increased from 4.8 million to 5.6 million, representing around three quarters of children in the UK. Just over half (52%) of these children are boys.

1.6.2 Income and social class
Levels of home Internet access are much greater among high income households than among low income households with the cost of computer equipment being at least one restricting factor.

The Family Expenditure Survey split households into ten equal groups (deciles) according to level of gross income and found that Internet access increased with income. Less than 25% of the lowest four income groups have home Internet access compared to 50% or more of the highest three income groups (see Table 1.1). Just 8% of households in the second lowest income group have access to the Internet, compared to 78% of households in the highest income group. The lowest income group may have greater home Internet access than the second group due to the inclusion of student households. The percentage change between time periods shows that the access gap between rich and poor may in fact be increasing.

Levels of access also depend on social class of head of household. Over 87% of ‘higher professional occupational’ households have home Internet access compared to just 23% of ‘routine occupations’ households. Seven in ten people in employment have Internet access compared with just three in ten amongst the unemployed, and only 16% of people living in rented accommodation have home Internet access compared with 36% of those owning their own home. Two thirds (67%) of individuals in the AB social grades have home Internet access compared to less than a quarter (23%) of those in DE social grades.

It is possible that the ability to access the Internet through digital TV may reduce inequalities in Internet access. The take up of digital TV is more evenly distributed across income groups and social class, although as yet only limited numbers of those with digital TV are actually using this technology to access the Internet.
digital TV is considered in more detail in Section 1.9.1. Inequalities in Internet access show the need for new technologies to be made accessible to socially disadvantaged groups and highlight the dangers of relying solely on health communications through electronic means.

Table 1.1: Households with home access to the Internet, UK, by gross household income

<table>
<thead>
<tr>
<th>Income group</th>
<th>Oct 1999- Sep 2000 (%)</th>
<th>Oct 2000- Sep 2001 (%)</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st decile (lowest income group)</td>
<td>7</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>2nd decile</td>
<td>5</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>3rd decile</td>
<td>8</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>4th decile</td>
<td>9</td>
<td>22</td>
<td>13</td>
</tr>
<tr>
<td>5th decile</td>
<td>18</td>
<td>32</td>
<td>14</td>
</tr>
<tr>
<td>6th decile</td>
<td>23</td>
<td>39</td>
<td>16</td>
</tr>
<tr>
<td>7th decile</td>
<td>30</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>8th decile</td>
<td>41</td>
<td>55</td>
<td>14</td>
</tr>
<tr>
<td>9th decile</td>
<td>51</td>
<td>65</td>
<td>14</td>
</tr>
<tr>
<td>10th decile (highest income group)</td>
<td>62</td>
<td>78</td>
<td>16</td>
</tr>
<tr>
<td>All households</td>
<td>26</td>
<td>37</td>
<td>11</td>
</tr>
</tbody>
</table>

1.6.3 Regional Variations

Internet access varies quite widely across the different regions of the UK, from 26% in Northern Ireland to 45% in London. Levels of access are higher in England than in Scotland, Wales and Northern Ireland, and within England there tend to be lower levels of access in the North of the country (see Figure 1.3).
1.6.4 Rurality

There is not thought to be very much difference between levels of Internet access in urban and rural areas. In 1996 there were estimated to be greater levels of access in urban areas, but this gap has since been closed. In fact, rural populations in Scotland are currently thought to have greater Internet access levels than urban residents. However, many people living in rural areas are currently excluded from access to broadband (fast) Internet access due to lack of access opportunities (see Chapter 5, Section 5.3 for more information on broadband). None of the major UK Internet surveys presently report Internet access figures for rural/urban populations, although the particular benefits to rural populations of the Internet suggest that it would be a priority for rural residents to get online. Rural inhabitants may live far away from shops and services, and the Internet can help overcome their isolation by enabling them to access services electronically, purchase goods online, communicate with health professionals and gain access to public health information.

1.7 Use and non-use of the Internet

1.7.1 What do people use the Internet for?

The most popular reason for using the Internet is for sending and receiving e-mail, an activity that 95% of households with Internet access involved in Oftel’s Residential Survey reported using the Internet for (see Figure 1.4). The second most popular online activity is gathering educational resources. Large percentages of people report using the Internet to find various types of information, the most common being information on travel (75%). Two fifths of respondents reported using the Internet for finding health information. A MORI survey on health communications found that almost 49% of respondents would prefer to get their health information from the Internet. The percentage of households accessing the Internet for most purposes reported in the Oftel survey increased between June 2000 and October 2001.

Amongst children, in the year 2000 over half (56%) reported using the Internet for homework purposes, and two fifths for e-mail (43%), games (42%) and for fun.
Just under a quarter (23%) of children used chat rooms, although among 15-16 year olds this figure increased to 41%.

### 1.7.2 Time spent online

The average amount of time spent online by households with home Internet access is almost nine hours a week, although this figure is inflated by a small proportion of ‘heavy’ Internet users, and in fact around half of all Internet-households spend less than five hours a week connected to the Internet\(^\text{19}\). Men access the Internet with more frequency than women, with 30% of male Internet users going online for personal (non work-related) use every day, compared with 23% of women\(^4\). Individuals with unmetered access to the Internet (usually paying a monthly fee instead of call charges) and with broadband (high-speed; see Chapter 5, Section 5.3) access are more likely to spend longer periods online than are those who pay according to use\(^5\).

### 1.7.3 Reasons for not using the Internet

Just under half (44%) of adults in the UK have never used the Internet\(^4\). The major reason for not using the Internet given by respondents to the National Statistics Omnibus Survey was a lack of interest, reported by 43% of non-users, whilst 17% felt they had no need to connect to the Internet (see Table 1.2). These individuals may not consider the information and services available online to be relevant to their lives. However, it is also possible that such individuals are not aware of the extent of information and services available online. This lack of desire to connect to the Internet may cause the government problems when attempting to get the UK online\(^27\). Conversely, a quarter (25%) of non-Internet users had not connected to the Internet because they had no computer or no other method of accessing the Internet, and a fifth (21%) felt they lacked the necessary confidence or skills to go online\(^4\). These individuals are more likely to respond to government initiatives.

<table>
<thead>
<tr>
<th>Reason for not using the Internet</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of interest</td>
<td>43</td>
</tr>
<tr>
<td>No need</td>
<td>17</td>
</tr>
<tr>
<td>Lack of confidence/skills</td>
<td>21</td>
</tr>
<tr>
<td>No computer or access</td>
<td>25</td>
</tr>
<tr>
<td>Cannot afford it</td>
<td>8</td>
</tr>
<tr>
<td>Feel too old</td>
<td>9</td>
</tr>
<tr>
<td>No time</td>
<td>5</td>
</tr>
<tr>
<td>Do not want to use</td>
<td>10</td>
</tr>
<tr>
<td>Have not got round to it yet</td>
<td>6</td>
</tr>
<tr>
<td>Poor opinion of the Internet</td>
<td>2</td>
</tr>
<tr>
<td>Health problems make it difficult</td>
<td>1</td>
</tr>
<tr>
<td>Other reasons</td>
<td>3</td>
</tr>
</tbody>
</table>
1.7.4 How individuals and organisations access the Internet

The majority (98%) of Internet users have used personal computers to get online\(^4\), and most people who use the Internet for personal reasons do so from their own home. The National Statistics Omnibus Survey found that, of all Internet users, 79% had home access and 35% had access at work\(^4\) (see Table 1.3). Oftel research found that 92% of medium businesses and 62% of small business are connected to the Internet\(^28\). It is estimated that 90% of UK employees are employed by businesses that have Internet access\(^3\), although the extent to which employees are allowed to use the Internet for personal reasons will vary. The percentage of respondents accessing the Internet through a public access point remains low but in the case of public libraries and Internet cafes/shops has increased slightly over the last year\(^4\).

<table>
<thead>
<tr>
<th>Place used to access Internet</th>
<th>January 2001 (%)</th>
<th>February 2002 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent’s own home</td>
<td>78</td>
<td>79</td>
</tr>
<tr>
<td>Another person’s home</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>Respondent’s workplace</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>School/college/university/other educational institution</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Public library</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Internet café or shop</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Community or voluntary organisation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Government office</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Somewhere else</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

1.8 Internet use by health professionals and other sectors

As a commitment of the NHS Plan\(^29\), GP practices and all clinical and support staff in NHS Trusts are to have desktop access to NHSnet, the NHS intranet (see Chapter 2, Section 2.8.1), with basic email and browsing facilities by March 31\(^{st}\) 2002\(^30\).

According to Project Connect, the programme with the responsibility of ensuring connection to NHSnet by General Practices, 97% of Practices had an NHSnet line installed and 94% of Practices had an email system installed by 24\(^{th}\) October 2001\(^31\). NHSnet connections are also installed in 100% of health authorities and 97% of Trusts.

In June 2000, the Royal Society of Medicine conducted a postal survey on Internet use among it’s members\(^32\). The majority of respondents (70%) were from the UK and, of all UK respondents, 83% were connected to the Internet either at home or at work. Less than 1% of world-wide respondents had no access to a computer, and most of these were aged over 60. Almost all (98%) respondents aged under 30 were online. Pathologists were most likely to be online (97%), followed by endocrinologists and oncoslogists (93%). 82% of GPs had Internet access, as did 78% of surgeons and 72% of psychiatrists. Those with the lowest levels of Internet access were gynaecologists and retired Royal Society members (63%). As well as using the Internet themselves, many GPs are now directing their patients to Internet sites for further information about conditions. A recent poll found that almost three-quarters of GPs advised patients to use the Internet for health information, with the most popular sites recommended by GPs being NHS Direct (www.nhsdirect.nhs.uk), BBC Health-Onli
Local authorities are adopting ICTs as a requirement of the government’s commitment to have all government services online by 2005 (see Chapter 2). Many local authorities are already online, although there is as yet no national target date for all councillors to have Internet access. Out of all 467 local authorities in the UK, 442 (95%) currently have their own websites. Local authorities have recently been required to produce an ‘Integrating Electronic Government’ statement, which should include a timescale for all councillors to be online and have a public email address.

Many of the major national charities/voluntary organisations are already online, such as AgeConcern, Diabetes UK, RNIB etc, although a comprehensive survey of Internet access amongst voluntary groups and charities in the UK is beyond the scope of this document.

1.9 New Methods of Accessing the Internet

The traditional method of accessing the Internet is through a personal computer (PC), and this remains the most common method of getting online, with 98% of Internet users having connected via a PC. According to Oftel, in February 2002, 54% of UK adults had a PC at home and 46% had home Internet access. Three in ten homes with Internet access had an extra telephone line for Internet purposes. However, new methods of accessing the Internet are now available, and are rapidly increasingly in popularity and accessibility. For example, it is now possible to access the Internet through digital TV, mobile phones, palm computers and games consoles and it has been estimated that by the year 2003 more Internet connections will be made through mobile devices than through PCs. In the future there are likely to be many more Internet-able devices, including wearable computers (computers that can be worn like items of clothing) and household appliances (the electronics company Toshiba have developed an Internet-abled refrigerator which is expected to be available in Japan in mid-2002).

At present, digital TV and mobile phones are the most popular and accessible alternative methods of getting online. Although the number of people currently using these technologies for accessing the Internet is still relatively low, the penetration of these devices throughout the UK indicates that their potential for future mass Internet access is high.

1.9.1 Digital TV

Digital TV was launched at the end of 1998, and by January 2002 nearly half (44%) of all UK adults had digital TV at home (see Box 1.4 for brief explanation of digital TV technology). Recent research has suggested that the number of households with digital television will continue to rise, with 55% of UK households expected to have digital TV by 2006. The government is planning a national transition from analogue TV to digital TV between 2006 and 2010, although a MORI poll (November 2001) found that half the population are not aware of this switchover. Only around 150,000 of the first six million TV sets to have been sold in the UK since the government announced the transition were digital, while a third of the population...
believes that the government should pay for them to switch to digital television. Digital TV can also be accessed through a normal TV using cable, satellite or in some cases normal TV aerials.

**Box 1.4 What is Digital TV?**

Digital TV uses computer technology to process and transmit programmes – sounds and pictures are converted into digits (ones and zeros) and compressed to use as little bandwidth (broadcast frequency) as possible. These digits can be transmitted through normal television aerials, satellite dishes or cables, and are turned back into sounds and pictures by a digital decoder which is either built into the television itself or which takes the form of a set-top box. By compressing the digits used for programme transmission, between six and eight different digital TV channels can be fitted into the same amount of bandwidth as just one analogue TV channel. As well as giving viewers a wider choice of programmes, digital TV provides a much better quality of picture than analogue TV. Most importantly, however, digital TV enables television to converge with information technology giving users the potential to use interactive services, send and receive emails and access information on the Internet.

There is a much more equal penetration of digital TV throughout the UK than there is for home Internet access. Figures 1.5 and 1.6 show the percentage of households with digital TV/home Internet access by household income and the percentage of adults with digital TV/home Internet access by social grade. Whereas the percentage of households with home Internet access increases with both household income and social grade, the percentage with digital TV is higher amongst middle-income households than high-income households, and there is little difference between AB and C social grades (Figure 1.6). Digital TV penetration is lowest among low-income households and DE social grades, but the difference between these and groups with greater access is far less pronounced than with home Internet access.

![Fig 1.5: Percentage of households with home Internet access/digital TV by household income](image1)

![Fig 1.6: Percentage of adult population with home Internet access/digital TV by social grade](image2)

*Social grade: A = Professional; B = Middle Managers; C1 = All other non-manual workers; C2 = All skilled manual workers; D = All semi-skilled and unskilled manual workers; E = On benefit/unemployed

Similar differences in digital TV penetration occur regionally, with Wales having the greatest percentage of digital TV users (27%), and London having the least (11%) (see Figure 1.7). This is the opposite situation to that for home Internet access where London has the highest levels of home Internet access, and Wales has one of the lowest rates. Age is also less of a determining factor for digital TV access, with
around a quarter of all 15-54 year olds having digital TV at home. The percentage of older people aged 55 and above having digital TV is however significantly lower at 13% \cite{21}.

The government sees digital TV as a major provider of Internet access to the UK population, although there are currently problems surrounding this method of Internet access. Digital TV can be used to access and search the World Wide Web, although most websites are currently not designed for this medium \cite{45}. While digital TV users may be able to access websites, many sites would prove problematic (or impossible) to use (See Chapter 5, Section 5.2). Currently, only 10% of those with digital TV are using it to access the Internet \cite{21}, and neither present nor potential digital TV users appear to be particularly enthusiastic about accessing the Internet through their television sets. The most popular interactive use of digital TV is currently for playing games (28% of digital TV users) \cite{21}. Research conducted for Oftel found that many digital TV users consider the use of interactive services through the television in a multi-person household to be ‘selfish’ and ‘inappropriate’ \cite{46}. Watching television is considered to be a social, unplanned and relaxing event, and many users are averse to the idea of having to ‘pull themselves together’ to use interactive services. More than a third of digital TV users also have home computers with Internet access and most prefer to use this medium to access the Internet rather than their TV \cite{21}.

Despite these findings, digital TV does still have potential for providing access to online facilities. The research conducted for Oftel found that, for a very small minority of digital TV users, largely elderly people with no experience of PC skills, digital television offered a unique opportunity to connect to the Internet without having to purchase complicated, intimidating equipment and without having to learn to use a computer \cite{46}. These individuals were very enthusiastic about being able to access online services through their TV. As a means of disseminating information, digital TV has the potential to cross traditional social and economic boundaries due to its more equal penetration throughout different population groups \cite{21}, and compared to the cost and skill factors associated with purchasing and using a PC, digital TV is relatively easy to use, requires only a minimal understanding of technology \cite{47}, is affordable and, importantly, is familiar to the population at large.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure1.7.png}
\caption{Percentage of UK adults with digital TV by region, August 2000 \cite{21}}
\end{figure}
In order to ensure that digital switchover is feasible between 2006 and 2010, the government will have to promote digital TV and work to persuade the public to switch voluntarily. In the White Paper, *A New Future for Communications* 36, the government expressed its commitment to ensuring that analogue signals are maintained until switching to digital TV is affordable for the ‘vast majority’ of people. However, the government may find it has to offer free conversion to digital TV for some part of the population in order to proceed with analogue switch-off.

The government’s ‘Digital Neighbourhoods’ initiative (see Box 1.5) is currently providing free digital conversion for selected neighbourhoods in the UK to explore the likely effects of the switchover. Also, some socially disadvantaged communities are receiving free digital conversion through government initiatives to increase Internet access and reduce the digital divide, such as the Wired Up Community initiative outlined in Chapter 2, Section 2.2.1.

### Box 1.5 Digital Neighbourhoods

In the run up to the digital switchover the government is undertaking a programme to create the nation’s first ‘digital neighbourhoods’ providing selected neighbourhoods with free digital TV conversion 48. Participants in the scheme will be able to view all current analogue programmes as well as the normal free digital channels (e.g. BBC Choice and BBC Knowledge), and will be able to access some Internet services and use email. It is hoped that the programme will inform the government and other interested parties of the social and practical issues to be faced when people switch from analogue to digital TV, both voluntarily and when analogue is finally switched off.

Once people have digital TV, a greater range of online information and services will need to be made accessible through this medium in order for the government to be able to encourage people to access Internet content. Interactive digital services will need to improve to work reliably and quickly, as currently the most common complaint about interactive services is speed 46. Despite present low usage, digital TV does offer huge potential for providing online information and services to a mass audience and for delivering health information directly into homes throughout the country. The Department of Health is currently piloting the use of digital TV for providing health information, more information about which is provided in Chapter 2, Section 2.8.3. Organisations planning to use ICTs to deliver public health information should consider developing Internet content to be accessible through this medium as well as through normal Internet channels (see Chapter 5).

### 1.9.2 Mobile Phones

In February 2002, 73% of adults in the UK claimed to own or use a mobile phone, and a further 7% reported living in a household with access to a mobile phone 49. Between January 1999 and November 2000, the price of mobile telephony services fell by 24% 50 making mobile phones more affordable to the general population, and around 5.5 million mobile phones were sold in the three months leading to Christmas 2000 alone 51. Figure 1.8 shows the increasing prevalence of mobile phone ownership amongst UK adults. The growing popularity and affordability of mobile phones is reflected in the slight decrease since 1999 in the percentage of homes in the UK with fixed line telephones from 95% to 93% 52. Currently 6% of UK households opt to use mobile phones instead of fixed telephony, whilst the remaining 1% is ‘unphoned’.
Some level of Internet access is currently available through WAP-enabled (Wireless Application Protocol) mobile phones, further information about which is given in Box 1.6. However, of the 4.3 million WAP mobile handsets currently in the UK, less than one million are being used to access online services. Similarly, amongst Internet users only around 6% claim to have used a mobile phone to access the Internet. Just below a quarter (23%) of mobile phone users think it likely that they will obtain an Internet-able mobile in the future (38% among 16-17 year olds), and greater interest in mobile Internet access is likely to develop over time as new technologies become available that offer rapid access to a wider range of online services (see Chapter 5).

**Box 1.6 Internet-able mobile phones**

Current Internet-able mobile phones use Wireless Application Protocol (WAP) technology to access online information using software on the phone operator’s network. WAP phones provide an Internet-type service offering limited content, e.g. train times, but are unable to offer full Internet access. WAP users are only able to access information on the Internet that has been written specifically for WAP devices – the very small screen size and slow data transfer speeds of WAP mobiles prevent them from accessing ‘normal’ Internet content.

Around a quarter of mobile phones available today are WAP enabled – although all mobile phones are likely to provide some type of Internet access in the near future. Internet-able phones currently operate about six times slower than a standard PC modem (at present standard modems transfer data at about 56k*). Emerging technologies such as GPRS (General Packet Radio Service) and 3G (Third Generation) mobile phones should allow more content to be delivered to phones at greater speeds (See Chapter 5). GPRS phones, expected to be available in the UK in 2003, will operate around four times faster than WAP phones. However mobile technologies should really take off with the introduction of 3G phones which may operate up to forty times faster than WAP phones. Due to their small screen size, however, the type of information that can be downloaded through mobile phones will probably always differ from that available through PCs and digital TVs.

* a bit, short for binary digit, is the smallest unit of data used by computers - a kilobit is a thousand bits. The speed at which data is transferred between two telecommunication points is measured in kilobits per second – kbps, but usually shortened to k. A 56k modem transfers 56,000 bits of data every second.
Ownership of mobile phones is highest amongst young people aged 15-44, of whom around 9 in 10 own a mobile phone. Use decreases with age, with less than a quarter (22%) of those aged over 75 owning a mobile (see Figure 1.9). The gap between young and old for mobile phone usage is likely to decrease naturally with time as the population ages. The highest earners (over £30,000 per annum) are more likely to own a mobile than are the lowest earners (£17,500 or below; see Figure 1.10). Similarly, 87% of employed individuals own a mobile compared to 57% of unemployed individuals, and 83% of AB social grades have a mobile compared to 48% of E social grades (see Figure 1.6 for social grades). However, levels of mobile phone ownership among lower income/social grade populations are steadily increasing and the gap between these groups and higher income/social grades is likely to decrease as ownership amongst higher income/social grades reaches saturation. Regionally, the penetration of mobile telephony is slightly lower in Scotland, Northern Ireland, and Wales than in England, and is lower in London than in the rest of England. The Midlands has the highest penetration of mobiles by household at 84%, and Wales has the lowest at 76%.

Fig 1.9: Mobile phone ownership in the UK, by age, February 2002

Fig 1.10: Mobile phone ownership by household income, UK
Children and teenagers make up a large part of the mobile phone market. In January 2000, it was thought that almost half (48%) of all 7-16 year olds and over three quarters (77%) of 14-16 year olds owned a mobile phone\textsuperscript{59}. Almost one third (30%) of young mobile users received a phone for Christmas 2000, whilst 10% own a WAP (Wireless Application Protocol) phone with some level of Internet access\textsuperscript{60}. Almost all (96%) used their phones for sending and receiving text messages (See Box 1.8), whilst 10% reported talking on their phone for more than three quarters of an hour every day. The Census At School survey found that 17% of primary school children and 58% of secondary school children owned a mobile phone\textsuperscript{61}. As well as being a fashionable accessory, a status symbol and a sign of popularity to many young people, mobile phones are seen as liberating – allowing young people to take control of their own lives, conduct private calls and exchange messages away from the prying ears of parents\textsuperscript{62}.

There are health issues surrounding the use of mobile phones, particularly by children, including concerns about possible cancer risks caused by microwaves and reports of headaches, nausea, dizziness, sleep disturbance and memory problems following the use of mobiles\textsuperscript{63}. An Independent Expert Group Report (the Stewart Group) into the health risks of mobile phones found that “the balance of evidence does not suggest mobile phone technologies put the health of the general population of the UK at risk. There is some preliminary evidence that outputs from mobile phone technologies may cause, in some cases, subtle biological effects, although, importantly, these do not necessarily mean that health is affected”\textsuperscript{64}. The report recognised that more research was required into the health effects of mobile phones and in response the government has announced a £7.4million research project - the Link Mobile Telecommunications and Health Research Programme (MTHR) - to examine the relationship between mobile phones and health\textsuperscript{65}.

On the positive side, it has been hypothesised that the increasing use of mobile phones by children is contributing to a decrease in cigarette smoking among this population. It is thought that children are more willing to spend their limited resources on mobile phones than on cigarettes and that having the latest technology is now more important to children than ‘old’ trends such as smoking\textsuperscript{66}.

<table>
<thead>
<tr>
<th>Box 1.8 Text Messaging</th>
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<tr>
<td>Throughout May 2001, 943 million text messages were sent by UK mobile phone users – an average of 30 million messages per day\textsuperscript{67}. This is almost double the number sent in May 2000 (500 million), showing the increasing popularity of both mobile phones in general and of the text message as a means of communication. Text messaging is particularly popular amongst young people due to its low cost. Almost all (96%) young people involved in a recent survey on mobile phone use reported using their phone for sending and receiving text messages\textsuperscript{68}.</td>
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1.10 Summary

Over the last few years the growth in ICT use in the UK has been dramatic, to the point that over half of all adults have now accessed the Internet at some time. It is expected that this growth will continue as methods of accessing the Internet increase and costs of Internet access decrease; in particular today’s young people will grow up with high levels of ICT competency and as routine users of new technologies. It is estimated that around 90% of all UK employees work in businesses that have Internet
access. All GPs and NHS Trust staff should have Internet access at work by the end of March 2002, and local authorities should have a target date for all counsellors to be connected to the Internet at work. High levels of ICT use amongst both the general population and health professionals give the Internet and email great potential for use in developing health networks, health promotion and protection, population medicine and the general dissemination of public health information. A large number of Internet users already use the Web to find health information, and the availability of a wide variety of accurate, high quality online health information can help people to improve both their own health and that of others; enabling individuals to become active participants in protecting and managing their own health.

The government aims to ensure that everyone in the UK who wants access to the Internet has it by the year 2005. At present, however, there is a ‘digital divide’ between those with access to ICTs and the Internet and those without – typically this divide favours those that are already economically and socially better off, and excludes those that are economically and socially disadvantaged. Although it is likely that the increasing penetration of mobile phones and digital TV will reduce the digital divide somewhat, those that have had more education and are better placed to afford new technologies will probably always have a greater ICT advantage over those that cannot. For example, a person with home Internet access through a PC and an Internet-able mobile phone will be able to make much greater use of the Internet and email than someone that has to travel to a public access point to get online.

The potential benefits of access to ICTs and the Internet are immense, including savings of both time and money and, most importantly, increased access to knowledge. There is a strong relationship between information, knowledge and health, and individuals with Internet access can potentially gain quality health information 24 hours a day and make informed decisions about their own lifestyle and health. Equally however, without the appropriate health professional understanding and input into Web content, the same individuals may access poor quality information or materials aimed specifically at promoting specific pharmaceutical products.

Individuals who are unable to access the Internet have far less opportunity to gain health information and already ICTs have the potential to promote inequalities in health. It is for this reason that an understanding of ICT access levels amongst different population groups is so important to any individual or organisation planning to use ICTs for health purposes. Public health now requires an intimate understanding of existing and emerging ICTs in order to maximise their use amongst health professionals and to address inequities in health generated through unequal public access. These issues will be addressed in the following chapters.

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National Initiatives for Information and Communications Technologies

2.1 Introduction

Information and Communications Technologies (ICTs) can potentially offer great advantages to society, for example through improving access to information and through increasing efficiency and reducing costs associated with a huge range of interactions and services. However, for the full benefits of ICTs to be achieved, access to and use of such service must include the whole range of professional organisations, community groups and individual members of the public. As more and more organisations begin using ICTs and providing online services, individuals that are unable to access the Internet and email are likely to find themselves excluded. Similarly, businesses that do not adopt ICTs and fail to offer their services online may find themselves losing customers to national and international competitors who are able to offer a more efficient and convenient service. Similarly, for the public sector optimal use of ICTs requires its effective application in; delivering services and information, establishing networks and, improving broader communication across public health, private and public sectors and the population at large.

In recognition of the importance of ICTs, the government has made getting the nation online a top priority and has set itself the target of ensuring “universal access to the Internet” by 2005\(^1\). Whilst the percentage of the population with Internet access is steadily increasing, it is unlikely that universal Internet access would be achieved through natural market growth. In a survey by Which? Online\(^2\), almost 70% of non-Internet users said that none of the new Internet access methods becoming available to them (e.g. digital TV, mobile phone) would persuade them to connect to the Internet. Experts predict that natural growth would give Internet access to 60%-70% of the population by 2003\(^1\).

Ideally, universal Internet access would mean that every household in the country possessed an Internet-able device offering unrestricted access to the World Wide Web\(^3\). In practice, however, the government means to provide the opportunity for every resident to access the Internet through public portals such as libraries, Internet cafes and the Post Office and through technologies such as digital TV that are not yet capable of delivering full Internet access. To some extent opportunities to access the Internet in public places already exist, although not to the degree that every citizen could use them as freely and frequently as they please.

Alongside its efforts to encourage the general and business population to connect to the Internet, the government is working to make its own services accessible via the Internet, to facilitate access to information, and to co-ordinate information compatibility between departments. For the NHS, effective transfer of knowledge is integral to improving public health and increasing efficiency within the health service\(^4\). The NHS has made the modernisation of its information systems and the online dissemination of information and knowledge a top priority. This chapter outlines some of the major strategies and initiatives taking place to increase access and use of ICTs in the UK, by both professionals and the general public, and provides
a brief overview of some of the resources developed by the NHS to achieve its information targets.

2.2 UK Online Strategy

To keep Britain up to date with technological change and promote universal Internet access, the government has introduced the UK Online strategy. The strategy aims to create opportunity for all UK residents to connect to the Internet, to encourage businesses to adopt ICTs and undertake online business transactions, and to move government services online. Some of the targets set through UK Online include:

- All libraries in the UK to be online by the end of 2002;
- All government services to be accessible via the Internet by 2005;
- Everyone who wants access to the Internet to have it by 2005.

The government’s UK Online strategy aims to ‘ensure that the UK is a world-leader in the new knowledge economy’. Through UK Online, the government is promoting use of the Internet and aiming to make the Internet accessible to everyone that wants to use it. To achieve this, the strategy sets out a range of objectives regarding use of the Internet at home, at work, in schools and in community settings. Figure 2.1 shows the main sections of the strategy and the objectives set out to achieve universal Internet access under the heading ‘Confident People’.

2.2.1 Promoting Internet access at home.

By keeping Internet connection and usage costs as low as possible and increasing the availability of different methods of accessing the Internet (e.g. digital TV), the government hopes to encourage individuals to connect to the Internet at home. A national transition from analogue to digital television is planned between 2006 and 2010, which should theoretically enable almost all households to connect to the Internet through digital TV, although there are some difficulties with this method of Internet access (see Section 1.8.1). Until the digital transition, those who cannot afford or who choose not to purchase a PC may benefit through other parts of the UK Online strategy. For example, employers are being encouraged to provide staff with PCs for home use, whilst at the same time 100,000 low cost recycled computers are being made available for low-income families. Individuals living in socially-deprived areas are also being targeted through the Wired Up Community scheme, which is equipping homes and schools in selected deprived areas with ICTs (see Box 2.1).
Improve Internet access at home, work and in the community
- Home: encourage employers to provide PCs and Internet access for home use; low-cost leasing schemes for public sector employees; low-cost recycled PCs for low-income families
- Work: promote benefits of Internet access for employees; government departments to address benefit of employee Internet access
- Community: establish network of UK Online Centres; Internet access through all public libraries; pilot new initiatives for Internet access in post offices and for disadvantaged communities

Embed ICT skills in the education system and lifelong learning
- Education system: improve ICT infrastructure in schools; improve educators’ ICT skills; stimulate high-quality online educational content; ICT work placements for 16+ students
- Lifelong learning: Invest £84 million through University for Industry (see Section 2.3); free ICT ‘taster’ courses for unemployed; 80% discounts for computer literacy training; high-quality lifelong learning content

Ensure safe and secure environment for e-commerce and to help people trust the Internet
- Protect children: including publicising best practice self-protection tips
- Safeguard online consumers: including promoting TrustUK hallmark for e-commerce websites
- Reduce online fraud: including encouraging credit card industry to establish online address verification system
- Combat online criminal activity: including establishing a National Hi-tech Crime Unit
- Protect online security: including ensuring protection against attacks on critical national information structure

Increase people’s motivation to access the Internet by increasing the amount and quality of social content
- Promote local online content
- Explore new ways to stimulate development and availability of high-quality online cultural content.

www.e-envoy.gov.uk
The government’s **Wired Up Communities** initiative is connecting around 14,000 homes in seven deprived urban and rural areas to the Internet using a variety of different technologies. £10 million is being invested in the scheme, which aims to explore the impact of ICTs on people’s lives, ascertain the most effective methods of creating equal opportunities throughout society, and evaluate the effectiveness of different ICT technologies. The communities involved in the scheme are:

- **Kensington, Liverpool (initial pilot project):**
  - 2,000 homes to be provided with recycled computers, new printers and Microsoft software packages

- **The Carpenters Estate, London:**
  - 750 homes to be wired up using set top boxes (digital TV) and ADSL (broadband); local school to be provided with laptop computers and electronic whiteboards

- **Framlingham, Suffolk:**
  - 1,500 homes to be wired up using new and recycled computers, and both standard phoneline/modem connections and wireless technology

- **East Manchester:**
  - 4,500 homes and local schools to be wired up using a variety of technology such as PCs, set top boxes, laptops and electronic whiteboards

- **Whitebirk Estate, Blackburn:**
  - 2,500 homes and five schools to be wired up using PCs, laptops and cable technology

- **Alston, Cumbria:**
  - 1,200 homes and three schools to be wired up using a wide range of technology including PCs, satellite dishes, electronic whiteboards, ADSL equipment, video-conferencing and laptops

- **Brampton upon Dearne, South Yorkshire:**
  - 1,500 homes to be wired up using set top boxes and local school children to be provided with laptop computer

An evaluation of the Wired Up Communities Programme undertaken by the Policy Research Institute found that the first pilot in Kensington had been relatively successful in engaging individuals without home Internet access and had managed to target those individuals at greatest risk of inclusion, although the second wave of schemes had yet to be put into practice.

### 2.2.2 Encouraging Internet access at work

Through UK Online for Business employers are being encouraged to provide employees with Internet access at work. Many employers view use of the Internet at work by staff for non work-related purposes as unproductive, yet businesses that have allowed unhindered staff access to new technologies have often found that their employees' development of IT skills and knowledge are of great benefit to the company. Full Internet access for public sector employees is being considered as a part of government departmental e-business strategies.

### 2.2.3 Providing Internet access in schools

By 2002, all UK schools should be connected to the Internet, all teachers should have access to ICT training, and there will be a greater focus on ICT in the National Curriculum. Students aged over 16 will be able to take part in ICT work placements, and by 2007, 83% of 14 year olds should be achieving a high standard of basic IT skills. In city schools, City Learning Centres will provide access to quality ICT equipment and training for pupils and teachers, and will also be available to the wider community as UK online centres (see Section 2.2.4). The National Grid for Learning (www.ngfl.gov.uk) has been created to provide a network for schools to gain access to high quality online education material on a wide variety of subjects and to develop links with other schools and institutions.
2.2.4 Providing Internet access in community-based public access settings

For those who do not have Internet access at home or at work, a network of public access sites is being developed to offer Internet access in community settings across the UK. Over 6,000 UK Online centres (www.dfes.gov.uk/ukonlinecentres) should be in operation by the end of 2002 giving people with little or no ICT skills the chance to learn how to use the Internet, send e-mails and use new technologies for learning and other purposes. These centres will be located in accessible public spaces such as community centres, libraries, colleges, Internet cafes and even pubs. The Office of the e-Envoy predicts that almost 99% of UK households will be within five miles of a public-access Internet point by the end of 2002, and 78% will be within one mile.

All the UK’s public libraries should offer Internet access by 2002 and all library staff should be trained in the use of ICTs. The use of Post Offices as Internet Access Learning Points is also being piloted. Most of the government’s initiatives to increase Internet access in community settings have the objective of teaching people to use ICTs and develop ICT skills. It is not yet clear to what degree individuals who already possess ICT skills will be able to freely access the Internet to find information and use online services.

Ideally, universal Internet access would be achieved by providing every individual with the ability to access the Internet at home. Provision of community Internet access may reduce the digital divide somewhat, yet individuals who can only access the Internet in public places will not receive the same benefits as those with 24 hour home access. The convenience factor of online transactions is removed if people have to travel or pay to use public access points. Importantly, issues such as health are personal and many people may be unwilling to access online health information in a public setting. Furthermore, some public Internet providers may use filtering software to prevent users from accessing ‘inappropriate’ web content, such as pornography, yet this technology may also prevent them from accessing genuine information – particularly effecting sites that provide information on issues such as sexual health and drug use.

2.3 Ensuring Access

Even if Internet access was conveniently available to everyone in the UK, there is no guarantee that people would actually use it. Of those adults who have never used the Internet, over a third have no interest in it and a fifth see no need to use it. A Manchester-based GP practice in a deprived area provided a free Internet service to patients in an attempt to research how the Internet could impact on use of primary care. However, the practice found that during the last three months of the trial only nine of their 13,000 patients actually used the service, all of whom had previous Internet experience and were employed and well educated. People are unlikely to access the Internet voluntarily unless they see a good reason for doing so, which means Internet content must be both relevant to their needs and interests and well advertised. If people can get easy access to up-to-date information on local events and news, or to web-sites about their specific interests, they are far more likely to use ICTs and gain new skills. The government aims to increase public motivation to use ICTs by providing learning opportunities and encouraging the creation of quality web content relevant to all sectors of society. The University for Industry has been created to offer free or low-cost courses for lifelong learning through the Learndirect service,
outlined in Box 2.2. Unfortunately, the Individual Learning Accounts created by the government to enable all adults to undertake subsidised learning were shut down in November 2001 following allegations of potential fraud by some providers\textsuperscript{14}.

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<th>Box 2.2: LearnDirect</th>
<th><a href="http://www.learndirect.co.uk">www.learndirect.co.uk</a></th>
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<td>LearnDirect is the government’s life-long learning initiative operated through the University for Industry. It aims to encourage skills development and increase ICT use amongst the adult population. By January 2002, the LearnDirect service was offering 591 courses, of which more than 75% were available online\textsuperscript{15}. Over 250,000 people had enrolled on LearnDirect courses (since 1st April 2000) and there were 1,553 LearnDirect centres throughout the country. Over 40% of those enrolled on LearnDirect courses had no previous qualifications, and 60% had not undertaken any learning in the three years before enrolling on a LearnDirect course\textsuperscript{16}. A quarter of respondents to a learner satisfaction survey reported that they would not have undertaken any other type of learning had LearnDirect not existed.</td>
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As more health information and services are being moved online, health organisations should also take responsibility for encouraging people to use ICTs and informing people of the various opportunities available for doing this.

### 2.4 Online Government

A further target of the UK Online strategy is to get all government services online by 2005. Individuals who access government services via the Internet will be able to do so at any time, and will no longer have to travel to government offices at inconvenient times, or waste valuable time queuing. In theory, instead of filling out numerous long and complicated forms that often ask for the same information, information should be able to be sent to the appropriate departments after being input just once. However, online government services are likely to bring about a reduction in face-to-face transactions and physical services. Between 1989 and 1999, for example, the number of bank branches in Britain fell from 17,100 to 12,144, largely as a result of telephone and online banking\textsuperscript{17}, and a similar fate may await government services. The heaviest users of traditional government services are often those with least access to new technologies - for example it is estimated that individuals on low incomes need to contact the government an average of ten times more than those on high incomes\textsuperscript{18}. This reinforces the need to increase Internet access among socially disadvantaged groups and to continue providing traditional methods of contacting government. Any transition from physical to online services would require careful management to prevent segments of society from becoming excluded or further disadvantaged.

### 2.5 Broadband Britain

Since the initial publication of the UK Online Strategy, the government has become more focused on the need for widespread adoption of broadband Internet access. Broadband is high-speed Internet access that enables people to use online services much more efficiently as data are transferred at a much faster pace. The publication of *UK Online: the Broadband Future*\textsuperscript{19} set a new target “for the UK to have the most extensive and competitive broadband market in the G7\textsuperscript{i} by 2005”\textsuperscript{20}. The government

\textsuperscript{1}The Group of 7, G7, comprises the heads of state of Britain, USA, France, Germany, Japan, Italy and Canada, who meet annually to discuss major economic and political issues. With Russian participation (since 1998) the G7 becomes the G8 (Foreign and Commonwealth Office)
aims to increase broadband penetration through initially increasing narrowband (normal) Internet access, then encouraging people to upgrade. As people upgrade it is thought that service providers will increase broadband content and applications, which will encourage more people to upgrade to broadband, and so on. More information on broadband is given in Chapter 5, Section 5.3.

2.6 Initiatives for Health

A crucial component of the government’s drive to modernise Britain is the modernisation of the NHS, with the aim of “giving the people of this country the best system of healthcare in the world”\(^{21}\). Integral to improved healthcare is the availability of quality information, and ICTs can provide the most efficient and effective ways of disseminating information to both health professionals and the public. ICTs are also providing greater opportunities for ‘telemedicine’ – a term used for any medical activity undertaken over distance using telecommunications\(^{22}\) (see Chapter 5, Box 5.4 for more information). For example, housebound patients may use ICTs to seek advice from health professionals at their local clinic, and ambulance staff may use ICTs to pass vital patient information to hospital staff so that preparations can be made for the arrival of casualties. The use of ICTs for health can greatly increase the efficiency of health services, can significantly improve the ability of health professionals to impact on the health of populations and can allow patients to take a more informed involvement in their own health.

In 1998, *Information for Health: An Information Strategy for the Modern NHS 1998-2005*\(^4\) was published. The strategy highlights the importance of the availability of quality, accessible information for professionals and the public in improving the health of the nation and in the efficient delivery of health services. Information for Health aims to ensure that NHS professionals have access to the information required to provide effective health care, and to provide the public with the information necessary to become active and informed participants in their own health care. The strategy visualises fast, convenient public access to online health information and services via a variety of technologies including digital TV and public multimedia kiosks. Box 2.3 outlines the main objectives of Information for Health.
Through the NHS Information Strategy, the government has set the following key objectives to improve and enhance delivery of information to both professionals and patients:

- To ensure that patients can be confident that the NHS professionals caring for them have reliable and rapid access, 24 hours a day, to the relevant personal information necessary to support their care
- To eliminate unnecessary travel and delay for patients by providing remote online access to services, specialists and care, wherever practicable
- To provide access for NHS patients to accredited, independent, multimedia background information and advice about their condition
- To provide every NHS professional with online access to the latest local guidance and national evidence on treatment, and the information they need to evaluate the effectiveness of their work and to support their professional development
- To ensure the availability of accurate information for managers and planners to support local Health Improvement Programmes and the National Framework for Assessing Performance
- 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.

The NHS Plan\(^23\), published in 2000, aims to provide Britain with “a health service fit for the 21st century: a health service designed around the patient”, and reinforces the intention to provide the NHS with the most up-to-date technological systems. The Plan promises modern information technology in every GP surgery and hospital and sets specific target dates for telemedicine applications (see Box 2.4). Recognising that “to deliver the NHS Plan, information and IT must be an intrinsic part of the agenda for change”, a separate publication - *Building the Information Core: Implementing the NHS Plan*\(^24\) - has been published focusing on the development of NHS information systems. By 2005, the government is aiming for “a vibrant networked NHS”\(^24\) featuring modernised systems including desktop email and browsing facilities for all NHS staff, electronic transfer of records within primary care and online booking systems.

ICT targets set out in the NHS Plan include:

- All GP practices to be connected by NHSnet by 2002
- An extra £250 million invested in information technology in 2003/2004
- The provision of health information via digital TV by 2004
- Access to electronic personal medical records for patients by 2004
- Electronic prescribing of medicines by 2004
- Provision of over 500 NHS Direct touch-screen information points throughout the country by 2004
- Electronic booking of appointments for patient treatment by 2005
- All local health services to have telemedicine facilities by 2005 (allowing patients to connect with staff electronically for advice)

With the aim of creating a “health service designed around the patient”\(^23\), several of the core principals of the NHS Plan focus on meeting the needs of patients and developing partnerships with patients and carers to ensure their requirements and views are represented in the decision making process. In September 2001, *Involving...*
Patients and the Public in Healthcare: A Discussion Document was released for consultation. This was followed by Involving Patients and the Public in Healthcare: Response to the Listening Exercise, which set out arrangements for involvement of patients and the public in the NHS, including the creation of Patient Advice and Liaison Services (PALS) to provide ‘on the spot’ assistance to patients, and Patient Forums in every NHS Trust and Primary Care Trust. To effectively become involved in decision-making within the NHS, the public require access to accurate and up-to-date information on health issues and policies and the structure and operation of the NHS. As the NHS Plan and Information for Health both envisage, public access to such information could be efficiently provided through on the Internet and should be accessible through various devices including PCs and digital TV. These devices could also provide opportunities for the public to easily pass their opinions on health service development to relevant health professionals. However, the existence and location of these resources will need to be widely advertised to ensure that all members of society know they are available and are aware of the potential benefits of accessing them.

2.7 Training for NHS staff

The successful implementation of Information for Health and the IT requirements of the NHS Plan is reliant on the development of IT skills throughout the NHS. Working Together with Health Education – A Partnership Strategy for Education, Training and Development was published in 1998, providing “policy level guidance about what needs to be done to help develop new skills and change the culture of information management and use in the NHS”. There is still a long way to go, however - the National Health Informatics Survey (2001) found that most NHS medical staff and clinical staff did not meet recommended levels of competency in any of the health informatics topics covered by the survey.

The NHS Information Authority now runs the Education, Training and Development programme, Ways of Working with Information, for the NHS with the aim of providing a single entry point to information for education, training and development in information management in the NHS (for more information see www.nhsia.nhs.uk/wowwi). Following work conducted for this programme the European Computer Driving Licence (ECDL), an internationally-recognised qualification designed to provide individuals with basic computer skills, has been adopted as a reference standard for the NHS. This means that all NHS staff should possess or develop the basic IT skills set out in the ECDL. All NHS staff will receive IT training and will work towards a standard qualification, although staff with other qualifications that demonstrate IT skills equal to or in excess of those gained through the ECDL may be exempt. Finally, the NHS University, outlined in Box 2.5, will provide new opportunities for NHS staff to develop IT skills, including working towards the ECDL.
<table>
<thead>
<tr>
<th>Box 2.5  NHS University</th>
<th><a href="http://www.doh.gov.uk/nhsuniversity">www.doh.gov.uk/nhsuniversity</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>The NHS University will be accessible to all NHS staff, as well as employees of private companies that provide NHS services. It will:</td>
<td></td>
</tr>
<tr>
<td>- provide a core curriculum</td>
<td></td>
</tr>
<tr>
<td>- act as a signpost to existing training</td>
<td></td>
</tr>
<tr>
<td>- provide a range of foundation, first-line and basic training programmes</td>
<td></td>
</tr>
<tr>
<td>- quality-assure and accredit existing training</td>
<td></td>
</tr>
<tr>
<td>- develop evaluation tools to make sure education improves patient care</td>
<td></td>
</tr>
</tbody>
</table>

The university’s curriculum will cover both individual and organisational learning needs and will include programmes to develop IT skills. The NHS University will be accessible to students both online and in physical learning centres and learning resources will be available online. It is expected that staff will be able to access resources in cyber cafes in NHS locations and via digital TV. Students will receive credits for successfully completing courses which can be used to support formal qualifications up to degree level. In time, it is hoped the NHS University will be established with a Royal Charter and will be able to make its own academic awards and be considered equal with any other UK university.

The NHS University is expected to benefit patients, individual NHS staff and the NHS as a whole through enabling students to develop to their greatest potential and improving services through the dissemination of knowledge and good practice.

While it is clear that the NHS recognises how important it is that its staff have IT skills, trainee nurses and medics do not as yet appear to be receiving the IT training necessary to prepare them for life in the NHS. The level of IT training received by trainees appears to be largely decided by the education institution running the nursing or medical programme. The UK Central Council for Nursing Midwifery and Health Visiting has set a number of IT-related objectives for nursing students at various levels, including developing the ability to record, enter, store, retrieve and organise data, and to interpret and utilise data and technology in the delivery and enhancement of care. However, there is no set IT training for nursing students and no specific time that must be dedicated to IT training during the nursing programme. The General Medical Council recognises that medical students should have a working knowledge of information technology, but does not appear to specify standards or to specify type or amount of training to be undertaken by students. It could be beneficial to both trainee nurses and medics and to the NHS itself if its future staff completed their training having gained a basic standard of IT skills.

2.8 The National Health Service Online

Strategies such as Information for Health and the NHS Plan have given rise to a number of NHS IT developments and Internet services for health professionals within the NHS and/or for NHS patients. This section provides an outline of a selection of these resources.

2.8.1 NHSnet  
(for more information see www.nhsia.nhs.uk)  
NHSnet, the NHS Intranet, is a secure computer network exclusively developed for the NHS. The service provides a range of information and communication services similar to those provided by the Internet whilst at the same time offering a secure environment for electronic health information. NHSnet users have access to email
A microsite is an area on the nhs.uk website set aside for individual NHS organisations to publish information on their services. Each NHS organisation is entitled to a microsite, and can enter information for publication through the use of templates, which ensure information is presented in a consistent format. Only designated Web Editors can set up a microsite (all health authorities and Trusts were required to designate a Web Editor in June 2000), which they can do by accessing the Web Editor section on the nhs.uk site (nww.nhs.uk/webeditor; NHSnet only). From here, Web Editors can access their microsites to add and update information and can also find further information on both microsites and local NHS websites. Information provided through NHS microsites includes contact details, service opening hours, types of services provided, disabled access and a location map, as well as links to service websites as they exist. In the future microsites will also contain socio-economic and demographic information for each health community. Microsites are accessible through the Local NHS Services section on www.nhs.uk.

Although NHSnet was developed for the exclusive use of NHS staff, it is now recognised that the sharing of information between different care sectors is crucial for effective and efficient healthcare delivery, and as such that the information available on NHSnet should also be available to non-NHS health professionals. Access to NHSnet is therefore expected to be expanded, with possible new users including dentists, pharmacists, opticians, Social Services, private health organisations and voluntary-sector organisations. Organisations that do not have access the NHSnet but believe that they are entitled to it should contact the NHS Information Authority who can help them get connected: www.nhsia.nhs.uk.

2.8.2 nhs.uk

Nhs.uk is the “official gateway to National Health Service organisations on the Internet,” providing information on the NHS and its services. Nhs.uk contains a searchable database of health services throughout the country, including GP surgeries, hospitals, dentists, opticians and pharmacies – providing a single point for the public to find information on local services. As a requirement of the NHS Plan all NHS organisations must supply and maintain local health service information on nhs.uk, which is done through the use of NHS microsites.

A microsite is an area on the nhs.uk website set aside for individual NHS organisations to publish information on their services. Each NHS organisation is entitled to a microsite, and can enter information for publication through the use of templates, which ensure information is presented in a consistent format. Only designated Web Editors can set up a microsite (all health authorities and Trusts were required to designate a Web Editor in June 2000), which they can do by accessing the Web Editor section on the nhs.uk site (nww.nhs.uk/webeditor; NHSnet only). From here, Web Editors can access their microsites to add and update information and can also find further information on both microsites and local NHS websites. Information provided through NHS microsites includes contact details, service opening hours, types of services provided, disabled access and a location map, as well as links to service websites as they exist. In the future microsites will also contain socio-economic and demographic information for each health community. Microsites are accessible through the Local NHS Services section on www.nhs.uk.

2.8.3 NHS Direct Online

NHS Direct Online, the Internet version of the NHS Direct telephone helpline, was launched in December 1999 and as of November 2001 was receiving around 4.6 million ‘hits’ every month, equating to approximately 140,000 visitors. By 2004 it is expected to be receiving millions of hits every week. The site aims to improve public
access to quality health information, both on the NHS Direct site itself and via a range of linked sites. NHS Direct only provides links to good quality health information, reducing the risk of users being given misleading or false information on health matters. NHS Direct Online also hosts important health service campaigns, such as information regarding the flu vaccination, features monthly health topics and offers online chat with professionals. The site was re-launched in November 2001 with a new structure, a health information enquiry facility which enables users to enquire about health information they cannot find on the site, and a new health encyclopaedia. The average user spends between 10 and 15 minutes on the NHS Direct Online website, viewing between 30 and 40 pages.

Increased access to NHS Direct Online is being provided through NHS Direct Information Points (kiosks) - standalone touch-screen systems provided in hospitals, health centres and other public places across the country. Early research into health information kiosks found that they were popular and well-used by the public. Information on medical conditions received the most amount of interest from users, with the most popular topics including back pain and abnormal heart rhythm. Over half of all users were under the age of 35, suggesting that IT literacy and familiarity is more of a determinant of use than is illness.

Access to NHS Direct information may be greatly increased through the use of different technologies, of which digital TV is possibly the most accessible and least threatening for many populations without Internet access. Some digital TV customers already have access to NHS Direct through NHS pilot projects being undertaken by Telewest in Birmingham (Living Health), by Communicopia in Hull and Chiswick and by Sky on a national basis (Channel Health). Box 2.6 provides more information on the Living Health service provided by Telewest.
Box 2.6: Living Health

Living Health is an interactive TV service being piloted by Telewest Flextech in conjunction with the NHS. The pilot is taking place in Birmingham, with the service being available freely to around 50,000 homes with Telewest digital subscriptions. Participants access the service simply by pressing the ‘interactive’ button on their remote control and selecting ‘Health’ – they are then taken to the Living Health home page which provides a selection of topics to choose from, including:

- Today’s Health News
- Healthy Living
- Men’s / Women’s / Children’s Health
- Illness and Treatment
- Local Health Services
- NHS Direct

Users can access up to 18,000 pages of accredited health information and can find contact details for local hospitals, GP surgeries, dentists, opticians, health centres and pharmacies. GP surgery details include information on special clinics, opening times and different languages spoken by staff. Users are able to book appointments with participating GPs using their remote control, whilst the NHS Direct InVision service lets users speak to a nurse via the telephone whilst watching him/her on their TV screen – nurses are specially trained and can show video clips and photographs to patients to facilitate consultation. The service is most used during the evenings and weekends when traditional surgeries are shut, and on each visit the average user spends around 20 minutes viewing 30 different pages. In the first four weeks following the launch of Living Health, the service proved more popular than the most widely used existing interactive services such as news and sport.

The Living Health project was originally intended to come to an end on 31st November 2001, but has been extended due to customer demand. The project is undergoing evaluation by the Department of Health which may lead to the service eventually being expanded to cover other cable customers throughout the country.

Living Health, 160 Great Portland Street, London, W1W 5QA

2.8.4 National electronic Library for Health

The NHS information strategy Information for Health included the target of introducing a National electronic Library for Health (NeLH) by March 2002. The aim of this library is to provide health professionals and the public with the knowledge and know-how to improve health, healthcare, clinical practice and patient choice. The objectives of the NeLH are:

- To organise knowledge and know how required by NHS professionals, and provide a single entry point and search facility for these resources.
- To develop/acquire/licence on-line resources for the NHS and UK public.
- To seek ways to integrate knowledge with clinical information systems in the NHS – including the electronic patient record.

The NeLH will provide research-based knowledge resources, giving priority to information from national bodies such as NICE (National Institute for Clinical Excellence) and the Commission for Health Improvement. An NeLH External Reference Group, with a recognised independent and authoritative membership, currently presides over the choice of information held on the NeLH, and has developed a quality criteria for resources that are held in the library. The core content of the NeLH is expected to be based on the following databases.
Some other resources available through the NeLH include a Guidelines Database, which provides access to national guidance, and the Hitting the Headlines service which provides a rapid service examining the evidence behind health stories in the news.

2.8.5 NHS Information Authority

Established in 1999, the NHS Information Authority (NHSIA) has responsibility for implementing Information for Health and for enabling the national infrastructure for an online NHS. The Authority develops national products, standards and services to support the most effective and appropriate use of information throughout the health service. The NHSIA also has responsibility for the development of the nhs.uk website, and is available to provide advice on the use of ICTs to NHS organisations.

The NHSIA website provides access to a wide range of information relevant to the NHS information strategy, including a number of key publications and up-to-date news articles. The site is split into four ‘zones’ providing information for different site users: patients and public, health informatics, industry and health professionals. The NHSIA maintains a mailing list to keep interested individuals informed of important developments and additions to its websites, and also provides a number of discussion boards, some of which are only accessible to those with NHSnet connections.

The NHSIA also maintains an ‘Information and Management Technology Procurement’ website, which provides information, advice and guidance on the development, management and evaluation of IT procurement projects for NHS organisations and individuals.

2.8.6 NHS Information Policy Unit

The NHS Information Policy Unit has responsibility for overseeing the implementation of Information for Health. As such, the Information Policy Unit website contains important information and guidance on maintaining information flows in the NHS during the implementation of Shifting the Balance of Power. This includes information governance to ensure confidentiality and security issues are properly addressed and issues surrounding key data and data quality. The site also provides access to policy, implementation and strategy documents for the development of information and IT.
2.9 Local NHS Organisations

In addition to the national NHS sites listed above, many local NHS organisations have their own websites providing information for local residents and professionals. Local NHS organisations were quick to see the importance of online information for their local populations, and hence many developed websites before national guidance was available. As such, when the Department of Health undertook the task of identifying local NHS websites they found a wide range of different structures, content, naming and navigation methods – leading to the decision to create a central gateway to local service information through nhs.uk (see section 2.8.2). nhs.uk links to local NHS websites, which provide additional information for residents typically including recent news, local publications, statistics, strategy and policy documents and links to other local services, and for which national guidance is now available.

The NHS is keen for local health organisations to maintain their own web presence. However, it is important that local NHS websites are representative of the NHS as an organisation and as such the Department of Health now provides NHS Identity Guidelines for NHS organisations wanting to maintain their own websites. Current guidelines cover issues surrounding accessibility and design – ensuring NHS websites are accessible to as many people as possible (e.g. including people with visual impairments and those working with dated technology) and that they reflect the values and principles of the NHS. Topics covered include:

- Navigation
- Text, backgrounds and colour
- HTML and alternatives
- Using graphics
- Colours, images, words and logos
- Copyright

The NHS Guidelines on websites are currently being updated and the new version is expected to also include information on naming websites and to provide a checklist of minimum content to be included on the site. NHS Identity Guidelines for websites are currently available on www.doh.gov.uk/nhsidentity/websites.htm. Further information on NHS Identity Guidelines is provided in Chapter 6, Section 6.3.

2.10 Information Systems

As Primary Care Trusts take responsibility for the delivery and management of local health services, they will also take responsibility for the modernisation targets of the NHS Plan. In order to achieve these targets, the information systems utilised by primary care organisations will need to be capable of implementing national initiatives such as Electronic Patient Records. Such systems must be capable of facilitating integrated working between various care sectors, must be secure and have consistent back-up facilities and reliable anti-virus and disaster-recovery facilities.

The Primary Care Information Modernisation Programme (PCIMP) has been set up to assist Primary Care organisations in developing and procuring information systems suitable for the modern NHS. Further information on information systems for primary care and on what assistance is available can be found in the PCIMP publication, Information and Information Systems for Primary Care Organisations.
which is published on the Primary Care Information Modernisation Board website; www.pcimb.nhs.uk. A report detailing networking requirements for primary care organisations is to be published shortly which will include guidance for local use.

2.11 Summary

Information and Communication Technologies have become an important focus area for government, which recognises the benefits of online operations such as efficiency, economy, skills development and transfer of knowledge. Through the UK Online strategy, initiatives are underway to encourage as many individuals and businesses as possible to start using ICTs and to make the Internet available to everyone should they want to use it. Particular concentration is being centred on efforts to reduce the digital divide in the UK which, if not addressed, is likely to lead to increased social exclusion among already deprived groups and which may also hamper efforts to move to an online society. Broadband Internet is becoming the preferred method of connection, whilst mobile phones, digital TVs and public access information kiosks are developing as alternative methods of providing universal access to online information.

The modernisation of the NHS is a top priority, and several key documents have been published over the last few years outlining the importance of information technology in the modernisation process. Up-to-date information systems are being installed throughout the NHS and online facilities are being utilised to enable the effective transfer of information and knowledge not only between health professionals but also with the general public. The NHS is aiming to develop into a patient-centred organisation but as this requires including the general public in the decision making process, access to ICTs will play an increasingly pivotal role in providing people with information about their own health and the operation of their health service. Several online resources have been developed by the NHS providing information and communication channels for professionals and the public. However, ongoing training of NHS staff must ensure a continued growth in the professional understanding and use of ICTs for health purposes. Furthermore, the effectiveness of many health initiatives will also rely on the ability of communities whose health needs are greatest being able to both access and understand ICTs. Currently, such access and skills are least likely to be found in these most needy communities.

Even where universal Internet access may be an achievable target, universal Internet use may be more difficult to attain. Without appropriate content many people will simply see no reason to connect to the Internet, whether they are provided with access to it or not. The government recognises this and is working towards promoting the development of content relevant to different population groups, and health could potentially play a key role in encouraging the use of ICTs. Health is a personal matter that people like to explore privately, and the Internet provides the perfect opportunity for doing so. Resources such as NHS Direct Online can ensure that people have access to quality health information and can seek further advice from experts if they want to know more. By providing public health information through alternative Internet access methods that are more affordable and prevalent amongst lower Internet using populations, public health professionals have a real opportunity to help improve health and reduce health inequalities.


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12 Varnam R (2001), A patient who changed my practice: “That’s very nice, but will it get me pregnant?”, BMJ, 323: 895
13 Policy Action Team 15 (2000), Closing the Digital Divide: information and communication technologies in deprived areas, Department of Trade and Industry
22 Wootton R (2001), Recent Advances: Telemedicine, BMJ, 323, pp557-560, 8 September 2001
24 NHS (2001), Building the Information Core – Implementing the NHS Plan, Department of Health: London
60 Primary Care Information Modernisation Programme (2001), Information and Information Systems 
January 2002
Chapter 3

The Professional Web: Online Public Health

3.1 Introduction

Already Information and Communications Technologies are impacting on public health. Many public health professionals use ICTs at work and home for communication and accessing/disseminating information, and the government’s drive to modernise the NHS should mean that all NHS staff soon have access to the Internet and email at work. Ultimately, the increasing use of telemedicine will revolutionise the way ill health is treated and necessitate greater ICT use amongst all health workers. For public health professionals this revolution is already underway with ICTs providing opportunities to enhance personal knowledge and skills, streamline data flows and improve timeliness of intelligence in order to promote health and reduce health inequalities.

Unfortunately, knowing where to find relevant information and intelligence and how to ascertain the quality of online information can be difficult. However, among thousands of health-related websites, there are a number that provide (or can help to provide) particularly important public health information for health professionals in the UK. These resources take many different forms, including:

- National Public Health initiatives
- Catalogues of online resources
- Public Health data repositories
- Government websites
- National association websites
- Journals
- Media organisations
- Mailing lists and discussion forums
- Search engines

To aid access and appropriate use of public health information and to meet the need for rapid communications, ICTs are being used to bring resources and knowledge together through managed public health networks at both local and national levels. These networks usually provide a virtual space where public health professionals can access information, share knowledge, gain support and stay informed of what is happening in their field. Managed public health networks are now particularly important to PCTs, and are seen as the preferred way of pooling skills and expertise in public health specialist areas and making them available across a range of organisations.

This chapter begins by briefly outlining some of the major benefits and uses of ICTs to public health professionals, before providing short introductions to the information sources listed above and examples of the types of resources available. The resources provided in this section are by no means exhaustive, and a wider list of online public health resources is provided in Appendix 2.
ICTs and the Public Health professional

Box 3.1 Some major benefits of ICTs to health professionals

- increased access to knowledge
- ability to keep informed of policy developments and emerging research
- increased communication with other professionals and the public
- rapid transfer of information and intelligence
- ability to discuss issues and ‘attend’ meetings online
- better management of information and intelligence

ICTs have the potential to provide a range of benefits to public health professionals, both in helping them carry out their job to their best ability and for their own personal development (see Box 3.1). The Internet provides an effective way of gaining health information for personal use and of disseminating it to the public; of enabling professionals to keep abreast of local and national developments; of finding information on best practice and evidence of effectiveness; of keeping in touch with the latest health news and research; and of communicating with other professionals. Many government publications and statistics are now freely available online, as are publications by other groups, abstracts and full papers from many journals, up-to-date news from major media organisations and much more.

Public health professionals require access to a wide range of information to support their work, yet the huge quantity of information available can make it difficult to locate relevant documents. Used properly however, ICTs provide the opportunity to manage information overload and to allow public health professionals to decide which information they receive and have it delivered direct to their desktop. Currently, national and local projects are underway developing ‘gateways’ to online public health resources; enabling a wide range of relevant resources to be accessed from one single location (e.g. Public Health electronic Library; see Section 3.3). Many organisations provide free email alerts informing subscribers when new information is published (e.g. 10 Downing Street, www.number-10.gov.uk), and others provide regular newsletters by email. Some services now allow subscribers to select topics of interest to them and only receive notification of new publications related to their choice (e.g. Info4Local; see Section 3.6). Online documents can then be accessed instantly for reading or printing and rather than having to personally scan large documents for specific information, users can use document search facilities to find key words in the text.

Public health professionals need access to information about the health of a wide range of populations. Many organisations collect public health data but in the past accessing such information has been a protracted process for many and beyond the expertise of others. ICTs are enabling better management and dissemination of public health data, with online networks and databases informing professionals of what information exists and how to access it. Increasingly organisations are providing free online access to data. Sensitive data can be transferred between bodies by email using encryption software that converts data into code for security purposes (e.g. many organisations use the freely available PGP (standing for Pretty Good Privacy) encryption software to transfer data electronically: www.pgp.com).
Public health networks of varying complexity are now bringing together elements of public health knowledge, information, expertise and experience (see Section 3.13) and according to the Department of Health, where appropriate e-mail is already “the prime method of communicating departmental business”. Furthermore, in today’s culture of partnership working, email is a vital tool in reducing time necessary to communicate with people in different organisations and across a wide range of geographical locations. An email list of group members allows information and ideas to be quickly exchanged between all individuals without having to post letters, make telephone calls or arrange meetings. In this new culture of communication, distance is irrelevant and both mailing lists and discussion groups regularly include local, national or even international representatives.

In the US, email is increasingly being used for communication between patients and physicians and it is likely that this will also happen in the UK. Such easy and rapid communication offers new opportunities for public health. For instance, as information about a certain condition becomes available it could be circulated directly to patients known to have the condition or considered to be at risk of developing it. Equally, at times of high interest in a particular topic, such as the MMR vaccination, targeted information could be sent by email to the parents of children who have yet to be vaccinated. However, without universal access and use of email facilities alternative methods of disseminating such information must also be maintained to prevent growing inequalities in health (see Chapter 1, Box 1.3).

The following sections outline a selection of online resources that provide access to public health information, data and knowledge on the Internet. There is substantial crossover between sections, with several of the resources outlined incorporating a number of different features and hence potentially fitting into a number of different categories. However, individual resources have only been outlined once and have been cross-referenced to other sections as appropriate. A wider list of resources is provided in Appendix 2.

3.3 National Public Health Initiatives

National policy has given rise to the development of a number of important online public health resources that aim to provide relevant and reliable public health information to both professionals and the public. This section provides information on a selection of these initiatives.

3.3.1 Public Health electronic Library

Information for Health identified the “urgent requirement” to organise, accredit and update the wealth of health-related material available on the Internet, and announced the development of the National electronic Library for Health (NeLH) to perform this task. The NeLH is to have sixteen ‘virtual branch libraries’ including the Public Health electronic Library (PHeL), which will provide a national gateway to online public health information, making the location of relevant, reliable public health resources less complicated and time-consuming. Box 3.2 provides more information on the PHeL.
The Public Health electronic Library (PHeL) is the public health virtual branch library of the National electronic Library for Health. The PHeL, being developed under the leadership of the Health Development Agency, intends to provide a national ‘gateway’ to online public health resources. The aims of the PHeL are:

- To provide a single ‘gateway’ site to link together the multiple range of related public health web-based resources in a simple and easy to navigate format
- To provide direct access to a range of public health related information
- To capitalise on the capabilities offered by new web-based technologies enhancing two-way communication and dialogue on key aspects of public health.

Rather than duplicating existing resources, the PHeL will provide signposting to accredited online resources from a variety of sources and will offer professionals a virtual space for finding reliable resources, exchanging and gaining knowledge, keeping up to date with current issues and communicating with peers. The site will be ready for initial piloting by April 2002 and will include:

- Information on national initiatives and policies
- Information on key local, national and international organisations, agencies, forums and people
- Access to evidence, information, data and toolkits
- Facilities for networking and electronic communication
- A glossary of public health terms

### 3.3.2 Public Health Observatories

The Public Health electronic Library provides a national entry to online public health information. At a regional level, *Saving Lives: Our Healthier Nation* announced the development of a Regional Public Health Observatory (PHO) for each NHS region, to provide a “network of knowledge, information and surveillance in public health”. Each Observatory maintains its own website providing access to regional public health resources including publications and data, while each has responsibility for national communication and sign-posting for various key areas as shown in Table 3.1.

<table>
<thead>
<tr>
<th>Public Health Observatory</th>
<th>Link Areas</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern &amp; Yorkshire</td>
<td>Mental Health; Prisons</td>
<td><a href="http://www.nypho.org.uk">www.nypho.org.uk</a></td>
</tr>
<tr>
<td>Trent</td>
<td>Diabetes; Teenage Pregnancy</td>
<td><a href="http://www.trentpho.org.uk">www.trentpho.org.uk</a></td>
</tr>
<tr>
<td>Eastern Region</td>
<td>Primary Care; Winter Pressures</td>
<td><a href="http://www.erpho.org.uk">www.erpho.org.uk</a></td>
</tr>
<tr>
<td>London</td>
<td>Inequalities; Social Exclusion; Regeneration</td>
<td><a href="http://www.lho.org.uk">www.lho.org.uk</a></td>
</tr>
<tr>
<td>South East</td>
<td>Coronary Heart Disease; Stroke; Men’s Health</td>
<td><a href="http://www.sepho.org.uk">www.sepho.org.uk</a></td>
</tr>
<tr>
<td>South West</td>
<td>Accidents and Injury; Children</td>
<td><a href="http://www.swpho.org.uk">www.swpho.org.uk</a></td>
</tr>
<tr>
<td>West Midlands</td>
<td>Cancer; Older People; Environment</td>
<td><a href="http://www.wmpho.org.uk">www.wmpho.org.uk</a></td>
</tr>
<tr>
<td>North West</td>
<td>Sexual Health; Drug Misuse; Communicable Diseases/HIV and HIV</td>
<td><a href="http://www.nwpho.org.uk">www.nwpho.org.uk</a></td>
</tr>
</tbody>
</table>

Box 3.3 provides more information on the work of Regional Public Health Observatories.
Box 3.3: Public Health Observatories

Public Health Observatories were set up through Saving Lives: Our Healthier Nation to:

• Strengthen the availability and use of information about health at local level; and
• Strengthen public health input into the broad range of cross-government initiatives aimed at improving health and reducing inequalities

The eight Observatories are linked through the Association of Public Health Observatories (APHO), which has developed a programme of work to support the development of the Observatories. In addition to this each Observatory undertakes individual projects in accordance with local needs. The central APHO website (www.pho.org.uk) provides a portal to all the current work being carried out by each individual PHO and all collaborative APHO work. A searchable database of national public health resources is also maintained which allows people to quickly identify (by topic) what data are available and if necessary, how to access such data. Individual PHO websites provide regional and local public health resources, including:

• Local health profiles:
  - providing health indicators at a local level with comparisons to national indicators, including life expectancy; standardised mortality rates for various diseases; teenage conception rates; crime figures; accidents; and deprivation

• Public Health data
  - providing access to data at local, regional and national level. Examples of available data include: population; birth rates; mortality from various causes; incidence of diseases; recorded crime; poverty and deprivation measures; life expectancy; and ethnicity

• Local reports and publications
  - each PHO publishes local research and information about issues pertinent to current issues and key areas of interest

• Database of regional public health expertise (currently under development)

Individual PHOs also provide access to a wide variety of additional public health resources depending up on the needs of their local populations.

3.3.3 The Health Development Agency

Saving Lives: Our Healthier Nation also brought about the creation of the Health Development Agency (HDA), a special health authority that aims to improve health and reduce inequalities in England. The main roles of the HDA are to gather evidence of what works to improve health and reduce inequalities, to advise on good practice and to support those working to improve the public’s health. The HDA has a key role in assessing and disseminating information required to improve the nation’s health and, as well as having responsibility for developing the PHeL, maintains its own online public health information service consisting of several websites. A selection of these is outlined in Box 3.4.
Box 3.4: Health Development Agency websites

The Health Development Agency develops and maintains a number of useful websites including:

- **Wired for Health**
  - [www.wiredforhealth.gov.uk](http://www.wiredforhealth.gov.uk)
  Wired for Health aims to ensure that quality health information is available to both teachers and pupils in line with the UK Online strategy. The initiative comprises four websites providing health-related content appropriate to different age groups and links to ‘accurate, clear and credible websites on a variety of issues’. The four websites are:
    - [www.welltown.gov.uk](http://www.welltown.gov.uk)
      - Key Stage 1
      - 4-7 years
    - [www.galaxy-h.gov.uk](http://www.galaxy-h.gov.uk)
      - Key Stage 2
      - 7-11 years
    - [www.lifebytes.gov.uk](http://www.lifebytes.gov.uk)
      - Key Stage 3
      - 11-14 years
    - [www.mindbodysoul.gov.uk](http://www.mindbodysoul.gov.uk)
      - Key Stage 4
      - 14-16 years

- **HAZnet (shortly to be re-titled)**
  - [www.haznet.org.uk](http://www.haznet.org.uk)
  A fully interactive site for sharing the evidence of good practice from Health Action Zones in tackling health inequalities. HAZnet is being redesigned to support new developments in public health and primary care. The new site will provide Primary Care Trusts and strategic health partners with a web-based knowledge management service about innovation in health service delivery and ways of tackling health inequalities.

- **The National HIV Prevention Information Service**
  - [www.hda-online.org.uk/html/nhpis](http://www.hda-online.org.uk/html/nhpis)
  A free online information service for people interested in HIV health promotion. The website provides access to a range of free publications for professionals, acts as a gateway to a range of online sexual health resources and provides links to the websites of numerous other HIV-related organisations.

- **HealthPromis**
  - See section 3.4
  - [http://healthpromis.hda-online.org.uk](http://healthpromis.hda-online.org.uk)

- **HIDA Evidence Base**
  - See section 3.4.1
  - [www.hda-online.org.uk/evidence](http://www.hda-online.org.uk/evidence)

### 3.4 Online Catalogues and Searchable Databases of Public Health Resources

Several resources exist that provide structured access to public health information through online catalogues or searchable databases, which are often freely accessible via the Internet. In many cases, the information included in these resources has been evaluated before inclusion by the organisation maintaining the catalogue or database. This allows health professionals to have greater confidence in the quality of the information they are accessing. Many national public health initiatives, including the Public Health electronic Library and the Public Health Observatories outlined in Section 3.3, provide these types of resources as part of their online service. In addition, a number of organisations and initiatives have been developed specifically to provide access to resources through catalogues and databases. A selection of these resources is outlined in Table 3.2.
<table>
<thead>
<tr>
<th>Table 3.2: Examples of online catalogues and searchable databases of public health information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OMNI</strong></td>
</tr>
<tr>
<td>Part of the BIOME service, OMNI provides free access to a searchable catalogue of health and medicine resources on the Internet, all of which have been selected by professionals and evaluated for relevance and quality. The service is maintained by information and subject specialists at the University of Nottingham Greenfield Medical Library</td>
</tr>
<tr>
<td><strong>HealthPromis</strong></td>
</tr>
<tr>
<td>An free online database of health promotion resources held by the Health Promotion Information Centre at the Health Development Agency containing references and links to health promotion resources including official publications, reports, books, surveys, websites and journal articles</td>
</tr>
<tr>
<td><strong>BUBL LINK 5.15</strong></td>
</tr>
<tr>
<td>A free online catalogue of Internet resources covering a wide range of academic subjects including Public Health. Resources are evaluated and catalogued by subject with a description and link provided for each resource.</td>
</tr>
<tr>
<td><strong>UK Public Health Knowledge</strong></td>
</tr>
<tr>
<td>A smaller resource but one that is very easy to use, providing links to a wide range of public health information on the Internet. Links are organised under headings including News and Events, Evidence, Topics, and Organisations. Within the Evidence section, for example, sub-headings include Guidelines and Data Sources, Literature Indices, Journals Online and Evidence-Based Health Sites.</td>
</tr>
</tbody>
</table>

### 3.4.1 Evidence Based Resources

Health professionals require information on best practice to support their work, and the development of evidence for health is a national priority. The Health Development Agency, the National Institute for Clinical Excellence and the NHS Centre for Reviews and Dissemination are major players in the development and dissemination of evidence for different aspects of health. All three organisations have developed important online facilities incorporating searchable databases to provide access to evidence to those who require it. Table 3.3 provides further information.

---

1 BIOME is an online resource providing a series of ‘gateways’ to evaluated information on health and life sciences on the Internet
Table 3.3: Searchable databases of evidence-based resources

<table>
<thead>
<tr>
<th>Database Name</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDA Evidence Base</td>
<td><a href="http://www.hda-online.org.uk/evidence">www.hda-online.org.uk/evidence</a></td>
</tr>
<tr>
<td>The Health Development Agency’s Evidence Base</td>
<td></td>
</tr>
<tr>
<td>is a searchable database that, in order to</td>
<td></td>
</tr>
<tr>
<td>inform Public Health practice, aims to provide</td>
<td></td>
</tr>
<tr>
<td>access to the best available online information</td>
<td></td>
</tr>
<tr>
<td>on what works to improve health and reduce</td>
<td></td>
</tr>
<tr>
<td>health inequalities. Information contained</td>
<td></td>
</tr>
<tr>
<td>within the database includes systematic</td>
<td></td>
</tr>
<tr>
<td>reviews of effectiveness, literature reviews,</td>
<td></td>
</tr>
<tr>
<td>meta-analyses and expert group reports.</td>
<td></td>
</tr>
<tr>
<td>National Institute for Clinical Excellence</td>
<td><a href="http://www.nice.org.uk">www.nice.org.uk</a></td>
</tr>
<tr>
<td>(NICE)</td>
<td></td>
</tr>
<tr>
<td>NICE is a special health authority that</td>
<td></td>
</tr>
<tr>
<td>aims to provide accurate and reliable guidance</td>
<td></td>
</tr>
<tr>
<td>on best practice to health professionals and</td>
<td></td>
</tr>
<tr>
<td>the public. NICE develops guidance on available</td>
<td></td>
</tr>
<tr>
<td>treatment options, including medicines,</td>
<td></td>
</tr>
<tr>
<td>lifestyle advice and surgical interventions and</td>
<td></td>
</tr>
<tr>
<td>provides a searchable database of Clinical</td>
<td></td>
</tr>
<tr>
<td>Guidelines, Clinical Audit and Technology</td>
<td></td>
</tr>
<tr>
<td>Appraisals.</td>
<td></td>
</tr>
<tr>
<td>NHS Centre for Reviews and Dissemination (CRD)</td>
<td><a href="http://www.york.ac.uk/inst/crd">www.york.ac.uk/inst/crd</a></td>
</tr>
<tr>
<td>The CRD provides information on the</td>
<td></td>
</tr>
<tr>
<td>effectiveness of treatments and the delivery</td>
<td></td>
</tr>
<tr>
<td>and organisation of health care. The CRD website</td>
<td></td>
</tr>
<tr>
<td>provides access to three major databases: the</td>
<td></td>
</tr>
<tr>
<td>Database of Abstracts of Reviews of</td>
<td></td>
</tr>
<tr>
<td>Effectiveness (DARE); the NHS Economic</td>
<td></td>
</tr>
<tr>
<td>Evaluation Database (NHSEED); and the Health</td>
<td></td>
</tr>
<tr>
<td>Technology Assessment Database (HTA).</td>
<td></td>
</tr>
</tbody>
</table>

3.5 Public Health Data

Public health professionals require information about the health of their local populations in order to properly target resources. A wide range of public health related data is already available online and efforts are being made to increase access to online data and to co-ordinate data standards between different government departments. Currently however, the use of different spatial levels (i.e. geographical boundaries) by different data providers creates a major problem for public health. Below the national level different organisational boundaries (e.g. PCT and local authority) mean that, despite access to multi-agency information, creating a full picture of local populations is still a technical and time consuming undertaking. The Policy Action Team 18 report\textsuperscript{14} identified several problems with data collection and availability, and the ensuing Neighbourhood Statistics services is developing a resource to provide comparable small area data for a variety of indicators (see Box 3.5). Ultimately, comparability of data collected by a wide range of organisations is not an ICT problem but requires the same nationally agreed small area geography (e.g. postcode) to be used by all groups.

Online data are currently available in a variety of formats, and much can be freely accessed. This section provides outlines of five major providers of online data: the Department of Health, the Office for National Statistics, the National Database for Primary Care Groups and Trusts, the National Centre for Health Outcomes Development and the Commission for Health Improvement. Some of the resources already outlined in this Chapter also provide access to or signposts to public health data, in particular the Regional Public Health Observatories.
3.5.1 Department of Health Statistics and Surveys

The Department of Health collects a large amount of health-related data, much of which can be accessed via the ‘Statistics and Surveys’ section of the Department’s website. Free access is provided to statistical publications such as the Health Survey for England, to statistical releases providing key statistics from monitoring systems such as the Regional Drug Misuse Databases (now National Drug Treatment Monitoring System) and to a wide range of data from other surveys and collection systems on public health, health care, social care, workforce and expenditure. In addition, NHS performance indicators for all health authorities and hospital trusts are made freely available. Selected data collected by the Department of Health are also made available through the Office for National Statistics website.

3.5.2 The Office for National Statistics

The Office for National Statistics website provides free access to ‘StatBase’, the National Statistics Encyclopaedia, which contains data gathered by a wide range of government departments, and includes a large amount of public health data. Data can be searched and displayed in a number of different ways, and selected data are accompanied by written descriptions and information about the data source and methods of collection. In addition to StatBase, the ONS website provides access to a number of other important services, including Neighbourhood Statistics and 2001 Census, outlined in Box 3.5.

<table>
<thead>
<tr>
<th>Box 3.5: ONS Neighbourhood Statistics and 2001 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neighbourhood Statistics</strong></td>
</tr>
<tr>
<td><a href="http://www.statistics.gov.uk/neighbourhood">www.statistics.gov.uk/neighbourhood</a></td>
</tr>
</tbody>
</table>
| The Neighbourhood Statistics Internet service, provided through the Office for National Statistics, has been developed to meet the information needs of the National Strategy of Neighbourhood Renewal[^15]. It aims to provide information at small area level to enable the identification of areas of social exclusion in order to inform local and national policy. Currently, Neighbourhood Statistics provides free access to a range of data presented at local authority and ward level available for the whole of the UK. The addition of a Geographic Information System during 2002 will enable live mapping and at full implementation (2003-2004) a much wider range of data will be available for various geographical areas (including those much smaller than wards). The raw data will be accompanied by an online set of analytical tools. Some of the data currently available through Neighbourhood Statistics includes:

- Health: drug misusers presenting for treatment; hospital episode statistics; attendance allowance claimants; disability living allowance
- Crime: notifiable offences recorded by the police
- Economic Deprivation: family credit and income support claimants
- Indices of Deprivation: for wards, districts and electoral divisions

**2001 Census**


Results from the 2001 Census are expected to become available between December 2002 and September 2003. Unlike previous census data, access to data from the 2001 Census will be free and unrestricted and will largely be provided electronically through the Census Access project. The Neighbourhood Statistics service outlined above will provide a single web-based access point to local area census data, whilst reports to parliament and other census products will also be available on the Internet. Census data will be available at various geographical levels and through a number of different delivery methods and facilities to suit different needs and expertise. Supporting information for data will also be provided. Census Access intends to provide the public sector with information and evidence at a local area level to assist policy making and evaluation[^16].
3.5.3 National Database for Primary Care Groups and Trusts  www.primary-care-db.org.uk

The National Primary Care Research and Development Centre (NPCRDC) has developed a national database specifically for Primary Care Groups and Trusts providing online access to information on socio-economic and demographic characteristics and general health status. This information can be linked to general practitioner, practice characteristics and primary care provision for all PCG/Ts in England and enables users to draw conclusions about how PCG/Ts are serving the needs of their local populations\(^{17}\). Data currently available includes:

- 1991 Census Data
- General Medical Services Statistics
- Measures of Deprivation (Jarman and Townsend)
- General Practice Level Proxy Measure of Need
- Income and Employment Deprivation Indices
- PCG Resource Allocations

Use of the database is currently available to NHS staff and the academic community, although wider access is envisaged. Registered users can select which dataset they are interested in and which area they want data for and are provided with raw data on which they are able to undertake their own analyses.

3.5.4 National Centre for Health Outcomes Development (NCHOD)  nww.nchod.nhs.uk

The National Centre for Health Outcomes Development has produced a ‘Knowledge Base’ that provides access to data and information on the assessment of health and health outcome interventions at various levels, including health and local authorities. A range of indicators are available, drawn from a variety of data sets, such as: the Public Health Compendium, Population Health Outcome Indicators, Our Healthier Nation indicators and indicators based on data from the Health Survey for England, each with attached data tables, maps and graphs showing comparative values where available. Detailed information about data sources and methods of calculation (metadata) is also provided. New indicators and data are added periodically as they are developed. At present the NCHOD Knowledge Base is only available to those with an NHSnet connection (See Chapter 2, Section 2.8.1), although it is expected to be more widely available in the future.

3.6 Clinical Governance

Clinical Governance was introduced in 1998 as a way of systematically ensuring the delivery of high quality health care throughout the NHS\(^{18}\). The 1999 Health Act\(^{19}\) placed a duty of quality on NHS organisations, which are responsible for ensuring processes are in place to ensure clinical standards are met, to help minimise and learn from mistakes and to enable continuous improvements throughout the NHS\(^{20}\). A number of online resources are available on clinical governance, including the NHS Clinical Governance Support Team and the Commission for Health Improvement outlined below. The National Institute for Clinical Excellence (NICE; see Table 3.3) provides access to NHS Frameworks, protocols and guidance to support clinical governance.
3.6.1 NHS Clinical Governance Support Team  
www.modernnhs.nhs.uk
The NHS Clinical Governance Support Team, through the Modernisation Agency, provides an online resource for NHS professionals with local responsibility for clinical governance. The site provides access to a range of documents to support clinical governance, publishes online case studies giving examples of how clinical governance has been implemented by NHS organisations, and provides a discussion forum for users to exchange ideas and information, details of forthcoming conferences relevant to clinical governance, and a list of useful links.

3.6.2 Commission for Health Improvement  
www.chi.nhs.uk
The Commission for Health Improvement (CHI) aims to improve the quality of patient care in the NHS by assessing NHS organisations and making its findings publicly available. The CHI monitors and reviews implementation of National Service Frameworks (NSFs) and National Institute of Clinical Excellence (NICE) guidance, and reviews clinical governance arrangements in Primary Care Trusts, NHS Trusts and health authorities every four years. The CHI website provides free access to reviews and investigative reports which provide a wide range of information on individual NHS organisations and their performance.

3.6.3 Proposed Commission for Healthcare Audit and Inspection (CHAI)
At present, the Commission for Health Improvement, the Audit Commission (responsible for health value for money) and the National Care Standards Commission (responsible for regulating social care and private and voluntary healthcare) work independently to assess and regulate performance. However, *Delivering the NHS Plan: next steps on investment, next steps on reform*\(^{21}\), proposed to bring these organisations together to form an independent Commission for Healthcare Audit and Inspection (CHAI). The CHAI will be responsible for inspecting both public and private health organisations (including all NHS hospitals), and its key roles will include conducting national value for money audits, and publishing performance assessment statistics (including waiting list information), and star ratings and performance reports for NHS organisations.

3.7 Government Departments: online information and documents

The Department of Health and other government organisations publish numerous documents and papers, including policy documents, research findings and guidance notes, which are freely accessible on the Internet. Government documents can usually be accessed via the specific department’s website. Web addresses for a selection of government departments are provided in Table 3.4.

<table>
<thead>
<tr>
<th>Government Department</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Health</td>
<td><a href="http://www.doh.gov.uk">www.doh.gov.uk</a></td>
</tr>
<tr>
<td>Department for Environment, Food and Rural Affairs</td>
<td><a href="http://www.defra.gov.uk">www.defra.gov.uk</a></td>
</tr>
<tr>
<td>Department for Transport, Local Government and the Regions</td>
<td><a href="http://www.dtlr.gov.uk">www.dtlr.gov.uk</a></td>
</tr>
<tr>
<td>Department for Education and Skills</td>
<td><a href="http://www.dfes.gov.uk">www.dfes.gov.uk</a></td>
</tr>
<tr>
<td>Department for Culture, Media and Sport</td>
<td><a href="http://www.culture.gov.uk">www.culture.gov.uk</a></td>
</tr>
<tr>
<td>Home Office</td>
<td><a href="http://www.homeoffice.gov.uk">www.homeoffice.gov.uk</a></td>
</tr>
<tr>
<td>Food Standards Agency</td>
<td><a href="http://www.foodstandards.gov.uk">www.foodstandards.gov.uk</a></td>
</tr>
<tr>
<td>Environment Agency</td>
<td><a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a></td>
</tr>
</tbody>
</table>
If it is not known which government department published a particular document, or to find general publications about a particular topic, the government’s UK Online website (www.ukonline.gov.uk) provides a cross-governmental search engine that searches a range of government departments. The service also provides an A to Z listing of links to around 1,000 government websites.

Government departments produce many documents and health professionals are likely to have difficulty keeping up to date with publications and new information. Some government departments provide free email alerts informing subscribers of new publications available on their website. A particularly useful email alert service covering a wide range of government departments is Info4Local, outlined in Box 3.6.

**Box 3.6: Info4Local**

Info4Local is a service set up for local authorities but which is also very useful to public health professionals in other organisations. It provides combined email alerts for a wide range of government departments, including:

- Department of Health
- Home Office
- Health Development Agency
- 10 Downing Street
- Health and Safety Executive
- Department for Transport, Local Government and the Regions

Subscription is free and users can select which government departments they want included in their alert, and which types of documents and which subjects they want to be informed about. The service can be accessed via the ‘email alert’ link on the Info4local website.

### 3.8 National Associations

National public health related associations can provide access to valuable online information and publications, and are often a good starting point for finding links to other relevant online information sources. A selection of national public health associations and examples of the type of resources they provide is given in Table 3.5.

**Table 3.5: National public health associations online**

<table>
<thead>
<tr>
<th>Association</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Medical Association</td>
<td><a href="http://www.bma.org.uk">www.bma.org.uk</a></td>
</tr>
<tr>
<td>Provides free access to: a wide range of fact sheets; links to national medical journals from around the world; online news; reports and; information on the work of the Committee for Public Health Medicine and Community Health. Some areas of the website are only accessible to BMA members.</td>
<td></td>
</tr>
<tr>
<td>Faculty of Public Health Medicine</td>
<td><a href="http://www.fphm.org.uk">www.fphm.org.uk</a></td>
</tr>
<tr>
<td>Provides information on: Faculty membership exams; public health medicine training programmes; continuing professional development; scientific meetings. Also provides access to publications and useful links.</td>
<td></td>
</tr>
<tr>
<td>Chartered Institute of Environmental Health</td>
<td><a href="http://www.cieh.org.uk">www.cieh.org.uk</a></td>
</tr>
<tr>
<td>Provides information on: policy; research; careers; training; publications and; events. Provides a range of resources covering food safety, housing, health &amp; safety and environment.</td>
<td></td>
</tr>
<tr>
<td>Association of Public Health Observatories</td>
<td><a href="http://www.pho.org.uk">www.pho.org.uk</a></td>
</tr>
<tr>
<td>Provides a portal to Regional Public Health Observatories plus a searchable database of a wide range of public health resources. Further information is provided in Section 3.3</td>
<td></td>
</tr>
</tbody>
</table>
3.9 Voluntary and Charitable Organisations

Most major public health-related voluntary or charitable organisations now have a web presence, and many publish documents such as reports, research findings and fact sheets online. These can often be accessed freely, or can be ordered using online order forms, and some organisations also provide email alerts to inform subscribers of new additions to their websites. Examples of some useful web addresses are given in Table 3.6. A more extensive list of web addresses for a wide range of national public health related organisations online is provided in Appendix 2.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Web address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Smoking and Health</td>
<td><a href="http://www.ash.org.uk">www.ash.org.uk</a></td>
</tr>
<tr>
<td>Alcohol Concern</td>
<td><a href="http://www.alcoholconcern.org.uk">www.alcoholconcern.org.uk</a></td>
</tr>
<tr>
<td>Age Concern</td>
<td><a href="http://www.ageconcern.org.uk">www.ageconcern.org.uk</a></td>
</tr>
<tr>
<td>Diabetes UK</td>
<td><a href="http://www.diabetes.org.uk">www.diabetes.org.uk</a></td>
</tr>
<tr>
<td>Royal Society for the Prevention of Accidents</td>
<td><a href="http://www.rospa.co.uk">www.rospa.co.uk</a></td>
</tr>
<tr>
<td>National AIDS Trust</td>
<td><a href="http://www.nat.org.uk">www.nat.org.uk</a></td>
</tr>
<tr>
<td>Cancer Research UK</td>
<td><a href="http://www.cancerresearchuk.org">www.cancerresearchuk.org</a></td>
</tr>
<tr>
<td>British Heart Foundation</td>
<td><a href="http://www.bhf.org.uk">www.bhf.org.uk</a></td>
</tr>
<tr>
<td>Shelter (Housing)</td>
<td><a href="http://www.shelter.org.uk">www.shelter.org.uk</a></td>
</tr>
<tr>
<td>Mental Health Foundation</td>
<td><a href="http://www.mentalhealth.org.uk">www.mentalhealth.org.uk</a></td>
</tr>
<tr>
<td>DrugScope</td>
<td><a href="http://www.drugscope.org.uk">www.drugscope.org.uk</a></td>
</tr>
</tbody>
</table>

3.10 Online Journals

Numerous journals and magazines are now published on the Internet. Some, currently including the British Medical Journal, allow non-subscribers free access to full-text articles online, whilst others require subscription. Some journals allow non-subscribers to pay to download articles or access the journal for a specific amount of time. Many also provide email services to inform interested parties of the content of new issues. Some popular health journals available online are shown in Table 3.7.

<table>
<thead>
<tr>
<th>Journal</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Medical Journal</td>
<td><a href="http://www.bmj.com">www.bmj.com</a></td>
</tr>
<tr>
<td>Health Development Today</td>
<td><a href="http://www.hda-online.org.uk/html/resources/hdt.html">www.hda-online.org.uk/html/resources/hdt.html</a></td>
</tr>
<tr>
<td>Health Service Journal</td>
<td><a href="http://www.hsj.co.uk">www.hsj.co.uk</a></td>
</tr>
<tr>
<td>The Lancet</td>
<td><a href="http://www.thelancet.com">www.thelancet.com</a></td>
</tr>
<tr>
<td>Journal of the American Medical Association</td>
<td><a href="http://jama.ama-assn.org">http://jama.ama-assn.org</a></td>
</tr>
<tr>
<td>Journal of Public Health Medicine</td>
<td><a href="http://www3.oup.co.uk/pubmed">http://www3.oup.co.uk/pubmed</a></td>
</tr>
<tr>
<td>NHS Magazine</td>
<td><a href="http://www.nhs.uk/nhs">www.nhs.uk/nhs</a> magazine/default.asp</td>
</tr>
<tr>
<td>Nursing Times</td>
<td><a href="http://www.nursingtimes.net">www.nursingtimes.net</a></td>
</tr>
</tbody>
</table>
There are thousands of academic and professional journals in publication. In order to find out what information and research has been published and in what publication, a number of literature indices are available online providing searchable databases of published material. These enable users to gain access to abstracts and provide links to full-text articles for journal subscribers, or to information on how to purchase the full-text article. One of the most widely used literature indices by health professionals is PubMed. It provides access to health-related literature and is outlined in Box 3.7.

**Box 3.7: PubMed**  

PubMed is a free online literature index provided by the US National Library of Medicine, which offers free access to a searchable database of over 11 million MEDLINE citations dating back to the mid-1960s as well as to many life science publications. The database covers the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and pre-clinical sciences. PubMed provides access to the abstracts of over 4,300 publications and links to websites providing full-text articles. Users can order journal articles online via local health libraries.

As part of PubMed, **PubMed Central** (www.pubmedcentral.nih.gov) provides a digital archive of health and life science publications, providing free access to full-text articles from participating journals. Some of the journals for which free access is provided include:

- Arthritis Research
- Breast Cancer Research
- Critical Care
- Respiratory Research

A similar service, which provides access to a wide range of literature including medicine, nursing, social sciences and food sciences is provided by Ingenta, outlined in Box 3.8.

**Box 3.8: Ingenta**  
www.ingenta.co.uk

Ingenta provides a free, online searchable database of published content from over 26,000 publications including many health and medical journals. Users can access abstracts to journal articles and by following the links provided, can find more information about where an article is published and how it can be accessed. If the user or their organisation subscribes to the journal that has published an article, they can often access the full-text of the article online through Ingenta.

Ingenta also provides details and links to a wide range of online information and Internet sites about various subjects. A list of subject areas is provided on the Ingenta home page. This leads users to links to online resources which may include:

- a list of relevant journals
- clinical trials
- data sources
- careers information
- associations
- news

---

1 MEDLINE is the US National Library of Medicine’s bibliographic database for medicine and health related sciences, containing bibliographic citations and abstracts from over 4,300 biomedical journals.
3.11 Media organisations

Health-related matters are popular topics for media coverage. Issues covered by newspapers, television and radio can be important sources of information for health professionals and a window onto the current health concerns of populations. The Internet now provides access to up-to-date health news through a variety of sites. Most of the UK’s leading newspapers have a web presence, as do most national and regional television and radio broadcasters, and many of these provide online access to news articles and other information. Even if the media is not always the most accurate record of health events, many reports will contain useful information about who to contact for more information. The BBC provides access to a range of health-related information, as outlined in Box 3.9.

<table>
<thead>
<tr>
<th>Box 3.9: The BBC</th>
<th><a href="http://www.bbc.co.uk">www.bbc.co.uk</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>The BBC has an extensive web presence which can provide access to valuable, up-to-date public health information. Some useful resources for health professionals include:</td>
<td></td>
</tr>
<tr>
<td><strong>BBC News Online</strong></td>
<td><a href="http://news.bbc.co.uk">http://news.bbc.co.uk</a></td>
</tr>
<tr>
<td>Provides access to current and past news articles and has a section dedicated to health news. The site contains a number of additional features including a “Talking Point” section covering health issues of current interest—background information and expert opinion is provided for each issue, and users can send in their own opinions for publication on the website. The “Medical Notes” section contains an A to Z listing of health conditions/issues with an explanation for each and links to related stories and Internet sites.</td>
<td></td>
</tr>
<tr>
<td><strong>BBC Health</strong></td>
<td><a href="http://www.bbc.co.uk/health">www.bbc.co.uk/health</a></td>
</tr>
<tr>
<td>The BBC Health website contains a large section providing health information such as:</td>
<td></td>
</tr>
<tr>
<td>• an illness and conditions database</td>
<td></td>
</tr>
<tr>
<td>• special sections on topics such as sexual health; diabetes; allergies; addiction.</td>
<td></td>
</tr>
<tr>
<td>• a web guide for finding online health information at other sites</td>
<td></td>
</tr>
<tr>
<td>• a guide to the NHS including the NHS charter</td>
<td></td>
</tr>
<tr>
<td>• an online first aid course</td>
<td></td>
</tr>
<tr>
<td><strong>BBC Radio</strong></td>
<td><a href="http://www.bbc.co.uk/radio">www.bbc.co.uk/radio</a></td>
</tr>
<tr>
<td>BBC Radio broadcasts can be listened to online, and previously aired news bulletins and documentaries can often be downloaded and listened to again. Users wishing to listen to online broadcasts will need the relevant software, which is available for download on BBC sites. The ability to play online audio recordings will depend on the capabilities of the users’ technology.</td>
<td></td>
</tr>
</tbody>
</table>

National and international newspapers can provide up-to-date information on health topics and also investigative reports into current public health issues. Some public health content provided by the Guardian’s website is outlined in Box 3.10.
 guarding Unlimited, the online version of the Guardian, provides free access to a large amount of the current day’s publication, and provides the opportunity for users to search for previously published articles. The Guardian site contains a number of additional information sources, including:

- ‘Special reports’ on topical issues, examples of which include:
  - Drugs in Britain
  - Refugees
  - Foot and mouth disease
  - Aids
  - Smoking
  - Medicine and science

- ‘Interactive reports’, providing information in an interactive format whereby users can ‘click’ on areas of interest to them for further information. Examples include:
  - NHS reorganisation (shows new NHS boundaries)
  - Crime figures (shows crime figures by police force areas)
  - Asylum seekers (including current legislation)

Guardian Unlimited has a special section on public health, which includes a list of links to useful public health related websites, available at http://society.guardian.co.uk/publichealth

A selection of web address to other online newspapers and resources are provided in Table 3.8.

### Table 3.8: Online news resources

<table>
<thead>
<tr>
<th>News Source</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Telegraph</td>
<td><a href="http://www.telegraph.co.uk">www.telegraph.co.uk</a></td>
</tr>
<tr>
<td>The Observer</td>
<td><a href="http://www.observer.co.uk">www.observer.co.uk</a></td>
</tr>
<tr>
<td>The Independent</td>
<td><a href="http://www.independent.co.uk">www.independent.co.uk</a></td>
</tr>
<tr>
<td>The Times</td>
<td><a href="http://www.thetimes.co.uk">www.thetimes.co.uk</a></td>
</tr>
</tbody>
</table>

**For links to more UK and International newspapers:**

- The Paperboy    www.thepaperboy.com
- NewsLink        http://newslink.org

**For health-specific news:**

- Reuters Health  www.reutershealth.com
- Health Media Group www.health-news.co.uk

### 3.12 Discussion Lists/Groups

Online discussion lists enable public health professionals, researchers, students and other interested individuals to exchange ideas on topical issues, ask for advice, disseminate information and find out about, for example, events, research and publications. Discussion lists operate by enabling subscribers to send messages to a group of people with similar interests. Individuals subscribe to a list by providing their email address to the computer that hosts the group. When a subscriber sends an email to the list’s email address, the host computer forwards that email to all other subscribers. Discussion lists are often moderated, with messages sent by subscribers being checked before being forwarded to other members to ensure their suitability\(^\text{23}\).
Discussion groups and lists can be a good way of establishing contact with fellow professionals and of sharing knowledge and support.

**JISCmail**, the National Academic Mailing List Service, is one of the main UK-based mailing list providers. The service maintains discussion lists on a wide range of topics, including many related to public health. A selection of potentially useful JISCmail lists and the web addresses from where they can be accessed are given in Table 3.9.

### Table 3.9: Public health related mailing lists through JISCmail

<table>
<thead>
<tr>
<th>Mailing List</th>
<th>Target groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health</td>
<td>For those working in epidemiology and public health</td>
</tr>
<tr>
<td>Public Health Intelligence</td>
<td>For those working in or using public health observatories and public health intelligence in the UK and beyond</td>
</tr>
<tr>
<td>Cancer Registration</td>
<td>For discussion of cancer registration, coding, epidemiology, aetiology and research and the exchange of national and international experiences and practices.</td>
</tr>
<tr>
<td>Drug Misuse Research</td>
<td>For those undertaking research in drug misuse.</td>
</tr>
<tr>
<td>Minority Ethnic Health</td>
<td>For professionals who work to improve the health of minority ethnic communities in the UK</td>
</tr>
<tr>
<td>Smoking-Sctrp</td>
<td>For smoking cessation counsellors</td>
</tr>
<tr>
<td>Urban Environmental Health</td>
<td>Health impacts of urban environment related diseases and hazards</td>
</tr>
<tr>
<td>Young Peoples’ Sexual Health</td>
<td>Young people's sexual and reproductive health</td>
</tr>
</tbody>
</table>

#### 3.13 Search engines

Search engines enable users to search for information on millions of web pages from around the world. They can be a very effective way of finding additional information to that held on professional public health sites, and can often introduce users to a huge range of material they did not know existed. Running a general search on a subject may also provide access to information about a subject from all different points of view; avoiding possibly biased opinions from individual websites. General search engines can sometimes be the fastest way to find online information even if users know which website the information they need is held on. For example, a good search engine may retrieve a published document faster than it can be accessed following the links from the publisher’s home page. Table 3.10 lists some examples of popular search engines.

### Table 3.10: Popular search engines

<table>
<thead>
<tr>
<th>Search Engine</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td><a href="http://www.google.co.uk">www.google.co.uk</a></td>
</tr>
<tr>
<td>Yahoo</td>
<td><a href="http://www.yahoo.co.uk">www.yahoo.co.uk</a></td>
</tr>
<tr>
<td>AltaVista</td>
<td><a href="http://www.altavista.co.uk">www.altavista.co.uk</a></td>
</tr>
<tr>
<td>All the Web</td>
<td><a href="http://www.alltheweb.com">www.alltheweb.com</a></td>
</tr>
<tr>
<td>Lycos</td>
<td><a href="http://www.lycos.co.uk">www.lycos.co.uk</a></td>
</tr>
<tr>
<td>Hotbot</td>
<td><a href="http://www.hotbot.co.uk">www.hotbot.co.uk</a></td>
</tr>
<tr>
<td>MSN</td>
<td><a href="http://www.msn.co.uk">www.msn.co.uk</a></td>
</tr>
<tr>
<td>Ask Jeeves</td>
<td><a href="http://www.ask.co.uk">www.ask.co.uk</a></td>
</tr>
<tr>
<td>IXQuick</td>
<td><a href="http://www.ixquick.com">www.ixquick.com</a></td>
</tr>
</tbody>
</table>
The quality of information retrieved through search engines will vary, with some search engines being more dependable for returning relevant results than others. For example, a search for ‘sexual health’ through one search engine may result in a list of good quality sexual health resources from recognised organisations, yet through a different search engine may result in a list of commercial organisations selling sexual ‘health’ products.

The Health on the Net Foundation (HON) provides a search engine that only retrieves information from medical sites and indicates which results belong to organisations that have signed up to the HON code (see Section 6.6.7), available at www.hon.ch/MedHunt. Due to the quality of some online health information, professionals should have some knowledge of evaluating websites for reliability and genuineness (see Section 6.6.8).

### 3.14 Managing Public Health Knowledge through Networks

There is a wealth of public health knowledge in the UK, yet whilst much information is freely available and many professionals are willing to share their expertise, locating knowledge and identifying individuals with specific skills can be difficult and time consuming. Valuable knowledge may be stored in databases, filing cabinets and even in people’s heads. Usually others are unaware of it even though such knowledge could be of immense value. Often this leads to duplication of effort as one individual or group invests time in trying to develop knowledge others already have at their fingertips. Hence, knowledge is one of the greatest assets available to public health, yet one which requires proper management for its full benefits to be realised.

A managed public health network can provide a mechanism for the exchange of information and knowledge between professionals, and can enable public health professionals to work towards a common agenda. The Faculty of Public Health Medicine defines managed public health networks as “linked groups of professionals and organisations working in a co-ordinated manner for a common goal of health and health improvement, unconstrained by existing professional and structural boundaries.” The growing levels of Internet use among health professionals means that the Internet now offers the perfect environment for managing knowledge through public health networks.

Some of the major benefits of managed public health networks include:
- Maintaining specialist knowledge and skills
- Training and learning opportunities
- Efficiency and economies of scale
- Professional accountability and clinical governance
- Opportunities for professional and personal development
- Sharing good practice

The demise of health authorities and transfer of power to PCTs is dissolving existing arrangements for sharing public health expertise, which have often involved the provision of public health specialist support to PCG/Ts from a health authority level. The smaller size of PCT means each providing public health specialist expertise in every area is an unlikely and uneconomic solution and therefore it is essential that PCTs develop new methods of sharing expertise and information. Managed public
health networks are now considered to be the most effective way of bringing together public health expertise and skills and making it available to a wider audience. As such, the Department of Health has built the development of networks into NHS policy with the new arrangements for public health in the restructured NHS including “a public health network of skills, knowledge and experience in every area designed according to local needs and circumstances”\textsuperscript{29}.

Managed public health networks will develop on national, regional, sub-regional and local level, and need to encompass the whole public health system. Figure 3.1 shows many of the main groups that make up the public health system in England. Efficient public health networking should provide a number of routes for individuals from one organisation to access skills, expertise and information in a different organisation anywhere in the public health system. Whilst at a national and regional level, partners that need to be linked through a network can largely be identified, at local level variations in organisational structures and partnerships mean networks will need to develop to suit local conditions. As some PCTs do not have the same geographical boundaries as other local organisations such as local authorities, networks will also need to be flexible and responsive\textsuperscript{29}. Public health networks, created as part of the restructured NHS, should ideally develop in accordance with existing local partnerships such as Local Strategic Partnerships\textsuperscript{30} and Drug Action Teams\textsuperscript{31} that already involve joint working between different organisations on a local basis.
Figure 3.1 The developing Public Health System

**National government departments and key units**
- DH (Health)
- DTLR (Transport Local Government)
- Cabinet Office
- DEFRA (Environment Food & Rural Affairs)
- DTI (Trade & Industry)
- DWP (Work Pensions)
- DfES (Education, Skills)
- HM Treasury
- DCMS (Culture Media Sport)
- DfID (International Development)

**Other public and private organisations**
- SEU (Social Exclusion)
- NRU (Neighbourhood Renewal)
- RCU (Regional Co-ordination)
- PIU (Performance Innovation)
- IDeA (Improvement & Development Agency)
- CHI (Commission for Health Improvement)
- NICE (National Institute for Clinical Excellence)
- MA (Modernisation Agency)
- HDA (Health Development Agency)
- SHA (Strategic Health Authority)
- DPH & PH Team (Primary Care Trusts)
- Community Plan
- Neighbourhood Renewal Strategy
- Other public sector eg: Education Police

**Key cross-Govt themes**
- modernisation
- democratic renewal
- equity & inequalities
- social & economic regeneration
- public involvement / engagement

**Key Units eg:**
- DH Health & Social Care Region
- GOR Govt Offices for the Region
- Regional Assembly
- RDA Regional Development Agency
- PHO Public Health Observatory
- SHA Strategic Health Authority
- Local Strategic Partnership (LSP)

**Regional government**
- Range of other regional multi-sector organisations & bodies

**Other organisations & bodies eg:**
- HDA Health Development Agency
- MA Modernisation Agency
- NICE National Institute for Clinical Excellence
- MA Modernisation Agency
- HDA Health Development Agency
- SHA Strategic Health Authority
- PHO Public Health Observatory
- Local Strategic Partnership (LSP)
- the public & wider community

National government departments and key units
Health organisations
Other public and private organisations
### 3.14.1 Existing Managed Public Health Networks

The benefits of managed public health networks have been recognised for some time by public health professionals, and various groups have begun developing and maintaining them. These networks aim to make information and expertise easily identifiable and accessible to health professionals working to improve health among a certain population or geographical area. At a national level, the Public Health electronic Library (outlined in Section 3.3) should provide a network for the exchange of information and ideas between public health professionals from around the country. On a local level, several managed public health networks are in existence, including the Cheshire and Merseyside Public Health Network outlined in Box 3.11. Efforts are underway to create a comprehensive national public health network through which all locally developed networks can be brought together (www.nphn.org). However, development is still in its early stages and is dependant upon local networks signing up to the same national system.

<table>
<thead>
<tr>
<th>Box 3.11: Cheshire and Merseyside Public Health Network</th>
<th><a href="http://www.communityzero.com/mcnet">www.communityzero.com/mcnet</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Cheshire and Merseyside Public Health Network is a managed network providing an online community for communication and the exchange of information and ideas between public health professionals in the Cheshire and Merseyside area. The network is managed by CommunityZero, an interactive website that allows a group of people to communicate and exchange information over the Internet in a private and secure area. Features of the Network include a directory of online resources, including websites and mailing lists; a discussion forum; daily health news from major newspapers, journals and websites; a notice board; a calendar of events; and access to local publications. Network members are able to add their own information such as new publications for other members to download or details about forthcoming conferences by simply filling in a short form with the necessary information or file location details. An email alert service informs members when new content has been added to the Network site.</td>
<td></td>
</tr>
</tbody>
</table>

### 3.15 Important links

There is a great deal of public health information already available online, and several organisations have responsibility for ensuring different aspects of public health information are disseminated effectively electronically. Some of the major public health sites, to which Primary Care Trust websites would ideally provide a link are shown in Figure 3.2.
Figure 3.2: Potential public health links from PCT websites.
3.16 Summary

Information and Communications Technologies have a growing importance in public health and are becoming more widely used for communication and the exchange of information between public health professionals. There are numerous benefits to professionals from using ICTs in their work, including the ability to manage information and network with other professionals more effectively. A huge range of public health resources are now available online, a number of which are of great value to professionals. However, finding appropriate resources can often be time consuming and information overload can cause important documents to get lost among the mass of other information that public health professionals encounter on a daily basis.

This chapter has provided an outline of some of the major public health resources currently available to professionals. The resources discussed here are by no means comprehensive and many alternative resources exist that can also be of great value in improving and protecting health. Management of online information can be difficult as the fluidity of the Internet means that online resources may move, change, merge or simply disappear at any time. However, the development of managed public health networks at different levels and for different target audiences should assist in keeping people informed of major developments relevant to their work. Developed and managed effectively and working closely with partners such as Regional Observatories, these networks can provide essential access to a complete range of skills, expertise, knowledge and resources to all professionals working within the developing public health system.

References

7 Jones R (2000), Developments in consumer health informatics in the next decade, Health Libraries Review, 17, 26-31
11 Department of Health (1999), Saving Lives: Our Healthier Nation, Department of Health: London
Chapter 4
Matching Health needs to Internet access: Using ICTs to reach Communities

4.1 Introduction

The growing use of new technologies in the UK is creating new opportunities for health organisations to use the Internet and other ICTs to disseminate public health information throughout the general population. Individuals with access to ICTs potentially can gain great health benefits, such as the ability to explore health matters privately 24-hours a day (see Section 4.2). A large number of Internet users are already using the Internet for health purposes, and many organisations and individuals have developed online public health resources providing access to information and often incorporating other facilities such as health discussion groups. Some major national resources available to the public have been outlined in Chapter 2 (e.g. NHS Direct Online and nhs.uk), and many of the resources outlined in Chapter 3 are also freely accessible to the public. This chapter provides information on a number of other resources available that are aimed at specific populations or that provide information on specific health issues.

The potential to use ICTs for public health purposes will vary depending upon the group or community being targeted. Typically, some groups such as young people may be easier to target through ICTs due to their high levels of access and use. Similarly some public health issues be particularly suited to the use of ICTs due to levels of Internet use among populations most likely to be affected by them and also to features of the Internet such as the ability to remain anonymous. Generally however, little evidence is available as yet as to what ICT initiatives in public health really work. As a result, evaluation of both the process of ICT development (including consultation with representatives of the target group) and the success of ICTs in public health measures remain fundamental to developing good practice.

This chapter looks at some existing uses of ICTs by the public for health purposes, and the potential of ICTs (particularly the Internet) for reaching different health populations and addressing different health topics. Not all subjects could be covered in this report and therefore case studies are provided in: ethnic minorities, older people, young people and disabled people and specific health issues included are sexual health, diabetes, mental health and smoking.

4.2 ICTs and the General Public

<table>
<thead>
<tr>
<th>Box 4.1: Some major health benefits of ICTs to the public¹,²,³,⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased opportunity to find health information and gain knowledge which can be used to make informed decisions about personal health care;</td>
</tr>
<tr>
<td>• Ability to gain access to health information at the patient’s own convenience;</td>
</tr>
<tr>
<td>• Ability to remain anonymous when seeking health advice;</td>
</tr>
<tr>
<td>• Increased opportunity to communicate with health professionals;</td>
</tr>
<tr>
<td>• Increased opportunity to communicate with other patients with similar conditions or experiences for support and information.</td>
</tr>
</tbody>
</table>

ICTs are providing members of the general public with access to them with the opportunity to take control of their own health. Rather than being uninformed recipients of the knowledge of health professionals, people are increasingly turning to the Internet to find out for themselves about conditions, risk behaviours, treatment options and general health information. As well as being accessible 24-hours a day, the Internet enables people to gain health information and advice anonymously, giving those who are unwilling to consult a health professional face-to-face the ability to seek advice and assistance online. Having access to a wide range of health information can help people understand their own health needs, look after themselves better and make appropriate choices about accessing services, all of which can reduce the pressure on local health services and enable them to function more efficiently.

Box 4.1 shows some of the major health benefits of ICTs to the public.

It is estimated that around half of all Internet users in the UK access online health sites, and there are thought to be over 100,000 health-related websites and an immeasurable number of health-related web pages on the Internet. In the US, it is estimated that 100 million Internet users search for online health information every month, with each user accessing health information an average of three times a month. Over half of these users searched for health information through a search engine (see Chapter 3, section 3.12), whilst just under a quarter logged directly onto a health-related site.

A survey by the Health on the Net foundation enquired about the use of the Internet by non-health professionals using questionnaires posted on health-related Internet sites. The survey found that the most popular medical use of the Internet was searching for information on professional medical sites and searching for information on drugs. Almost two thirds (64%) of respondents discussed health information found on the Internet with their physician (see Figure 4.1). The survey found that although some health professionals do not think the Internet is beneficial to patients (largely due to the risk of self-treatment), most (78%) agree that it could make patients more knowledgeable and can facilitate communication between patients and professionals.

The quality of online health information has long been a cause of concern due to the possible dangers of people accessing inaccurate information. There are no restrictions on publishing on the Internet, and therefore anyone can pose as a health professional or publish false or misleading information that may be retrieved by search engines. Several studies have been undertaken to assess the accuracy and usability of online health information, with most finding some level of unreliable or inaccessible
information (e.g. information located through search engines on cancer, sex education and emergency contraception). There are also concerns about commercial producers advertising their products in the guise of medical advice. Recent research found little evidence of harm to health as a result of the Internet, although a small number of cases have occurred where individuals have had severe reactions or even died as a result of treatment recommendations found on the Internet. Several tools have been developed for evaluating online health information, including Discern (see Chapter 6, Section 6.6.8), although these tools should themselves be evaluated before being used.

Importantly, the majority of individuals begin their search for health information with a search engine (over 80%) and most (64%) eventually gain their information from a website they had never heard of before. Thus, while a growing number of government, academic and professional organisations maintain good quality websites that provide and link to quality health information, their effect on health relies on raising public awareness and confidence in these sites above those purveying inaccurate information. One of the most popular health websites amongst the public is NHS Direct Online, the online version of the NHS Direct telephone helpline (See Section 2.7.3). GPs are also more likely to refer their patients to NHS Direct Online than to any other website. Websites developed by health professionals and especially PCTs should always provide links to existing quality information sources in order to promote quality information for both public and professionals. Figure 3.2 in Chapter 3 provides information on some of the most important public health sites in the UK for PCTs to link to via their own websites.

Aside from using the Internet to find health information, ICTs can also be used by the public for communicating with health professionals and other individuals for information, advice and support. Many online self-help groups have developed over the last year, enabling people to meet and communicate with others with similar health interests or experiences. Such resources can provide valuable networks of support and encouragement – for example, one study looking at a self-help group for problem drinkers found that only a fifth of exchanges actually involved the exchange of advice on drinking whilst two fifths were sociable and friendly exchanges.

With increasing numbers of patients gaining Internet access and hence using it for health purposes, the opportunities for health promotion activities and for the dissemination of public health information to patients is increasing. In 1998 it was estimated that: over a million British Internet users suffered from allergies or skin conditions; 686,000 had chest or breathing difficulties; 563,000 had heart problems; 352,000 had hearing difficulties; 317,000 suffered from migraines; 246,000 had difficulties with their stomach or digestive system; over 35,000 had problems with drugs or alcohol; and around 18,000 had epilepsy. The growth in Internet use since 1998 suggests that these figures are now significantly higher, and hence that ICTs have the potential to offer a platform for targeting these populations with online health information.

In the absence of universal Internet access and use, however, it is imperative that public health organisations using ICTs to disseminate information continue to provide access to information through traditional methods. Following the broadcast of an
episode of Coronation Street dealing with a rape storyline, for example, only a website address was given out for viewers to find follow up information – effectively excluding that large portion of the population that does not have Internet access. To prevent increases in health inequalities, non-Internet users must be given the same opportunity to access information as Internet users.

4.3 Case Studies

4.3.1 Ethnic Minorities
Inequalities in health are particularly apparent among black and ethnic minorities who are more likely to suffer from poor health and less likely to have access to the services they need than the general population. Table 4.1 shows selected health indicators for some ethnic groups in comparison to the general population. In particular for Black Caribbean, Indian, Bangladeshi and Pakistani minorities, the prevalence of diabetes, percentage having visited their GP in two weeks (before survey) and percentage with self-assessed bad health are substantially higher than the general population although alcohol consumption is lower. Some aspects of such health problems in ethnic minority groups could be addressed through ICTs.

Table 4.1: Selected health indicators, ethnic minorities

<table>
<thead>
<tr>
<th></th>
<th>Prevalence of diabetes (%)</th>
<th>Consulted GP in 2 weeks before survey (%)</th>
<th>Mean weekly units of alcohol consumed</th>
<th>Self-assessed bad or very bad health (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Black Caribbean</td>
<td>7.8</td>
<td>7.9</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>Indian</td>
<td>7.7</td>
<td>4.7</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Pakistani</td>
<td>8.7</td>
<td>5.3</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Bangladeshi</td>
<td>10.6</td>
<td>5.9</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Chinese</td>
<td>4.2</td>
<td>2.6</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Irish</td>
<td>4.2</td>
<td>2.4</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>General Population</td>
<td>3.3</td>
<td>2.5</td>
<td>12</td>
<td>18</td>
</tr>
</tbody>
</table>

However, black and ethnic minorities are more likely to live in socially disadvantaged communities and, as Internet access is lower amongst socially disadvantaged groups, it is likely to be lower amongst black and ethnic minorities. This is not to say that ethnic minorities are less likely to want to use ICTs, and there are indications that in some areas ICT take up may actually be greater amongst black and ethnic minorities than amongst white populations. The London Borough of Lewisham’s Annual Resident Survey (1998), for example, found that more Asian and Black residents owned a PC (43% and 40% respectively) than white residents (34%), and that Internet access was higher among Asian and Black residents (22% and 18% respectively) than among white residents (12%). Thus, factors other than ethnicity are limiting ICT use amongst ethnic minorities.

ICTs can have numerous benefits to people from black and ethnic minorities including social interaction, skills development and promotion of equal opportunities and they can enable people to access specific cultural information and meet people from similar cultural backgrounds. For individuals with family and friends abroad, e-mail and the Internet can be used to keep in touch as well as for
practical purposes such as transferring money. Black and ethnic minorities may have specific health needs which may not be catered for in their local area and thus may be able to use the Internet to access information and get advice from a specialist health professional or website. ICTs may also help overcome some cultural barriers to health\(^22\), for example by providing women whose cultural beliefs make them reluctant to visit public health centres with an alternative method of accessing services and information.

Possibly the greatest barrier to ICTs for many ethnic minority individuals is language. In some inner-city areas in the UK, English is no longer the main spoken language with languages such as Urdu, Punjabi and Gujarati being more widespread\(^25\). However, the standard English keyboard is practically unusable for people whose written language uses different characters; instructions to most computer packages are in English and; up to 80% of text on the Web is in English\(^24\). Developments in language fonts and electronic translation packages should help non-English speaking Internet users, although ICT use by non-English speakers is unlikely to reach its full potential until greater content is available in other languages. A number of free website translation services already exist, such as those provided by Alta Vista (www.altavista.co.uk) and by websites such as www.freetranslation.com. However, these services cannot give completely accurate translations and although able to give a idea of the content of web pages, they are unsuitable for the translation of health information as inaccurate translations may lead people to take a course of action that is damaging to their health. Some initiatives are developing to provide accurate health information in a variety of languages, including the Mypil.com service, outlined in Box 4.2, which provides multi-language health information for health professionals to pass on to patients.

**Box 4.2: Mypil.com**

<table>
<thead>
<tr>
<th>Mypil.com is an online multilingual health information resource, developed by +VE Partnerships Ltd. The initiative aims to improve the health of diverse patient groups through providing quality health information to health professionals for provision to non-English speaking patients. Health information is currently provided in English, Urdu, Hindi and Bengali, with the same information being available in all languages. Health professionals are able to read the information in their own language and, if it is considered appropriate for their patients, can pass the information on in a different language with the knowledge that the information will be the same. Site content is provided through selected organisations and is considered for publication by an editorial board consisting of multi-lingual health professionals.</th>
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</table>

A Department for Education and Skills (DfES) research project regarding the potential use of UK Online Centres for ethnic minority groups identified several other possible barriers to use of the Internet by ethnic minorities, including:

- Limited experience of computers and the Internet due to lower education levels;
- Concerns over inappropriate web content (pornography, cultural imperialism etc.);
- Lack of interesting content for non-English readers.

The DfES found that, without English language and Internet searching skills, little information aimed specifically at ethnic minorities could be easily accessed online. NHS Direct online provides a limited yet growing\(^26\) amount of information for non-
English speaking residents - provided in audio-clip format (speech that can be listened to online: see www.nhsdirect.nhs.uk/listen) - but without English language skills this information would be difficult to find as it is not well signposted. DfES research recognised the use of stream audio/video (recorded speech/video that can be listened to/viewed online) to be an effective way of providing information for non-English speaking (and illiterate) individuals, although the researchers found very little audiovisual content for non-English speakers online. Future developments should hopefully make the Internet more accessible to ethnic minorities. Office XP, the successor to Office 2000, for example, offers a wide range of languages not previously available including many Asian and African languages spoken in the UK. For more information on technology for ethnic minorities and non-English speakers see Chapter 7 of the DfES publication, currently available at www.xenex.co.uk/dfee.

ICTs have great potential for promoting health amongst ethnic minorities by creating opportunities for the provision of health information and advice to ethnic minorities in their own language and in a culturally sensitive manner. Often though, the ethnic minority population within many PCTs may not be large enough to allow development of web based facilities aimed specifically at ethnic minorities. In order that this group is not further excluded, partnerships between health areas may wish to address such ethnic minority issues on a strategic health authority or regional level. A number of useful ethnic health-related websites already exist, a selection of which are listed in Appendix 2.

4.3.2 Older People

Older people have greater health needs than the general population and are the heaviest users of the NHS. Therefore, potentially they should stand to gain significant benefits from using ICTs. For example, older people may have mobility problems or be housebound, and ICTs can provide them with access to health information and services from home. They can help people to live independently in their own homes and can help overcome isolation, facilitate communication, increase self-esteem and maintain mental skills. Many older people with Internet access find that it has reinforced relationships with family and friends and has given them something in common with younger generations.

However, the percentage of people having access to the Internet decreases with age and, compared with the general population, relatively few older people are online. In September 2001, just 11% of people aged 65 and over had used the Internet, compared to 53% of the general population (see Figure 4.2). Although the percentage of older people who have accessed the Internet is increasing, it is increasing at a slower rate than that for the adult population as a whole. However,
with 37% of 55-64 year olds having used the Internet, the age gap between Internet users is very likely to decrease if only because these individuals will progress into the older age group.

For older people, computers and other ICTs can be intimidating and many may choose to avoid them. Computers will not have played a large role in the lives of most older people - the personal computer was not developed until the 1970s, and many individuals in retirement will not have experienced computers as a normal part of working life. However, according to Age Concern there are 4.6 million people aged 50+ who use computers, 4 million of which own their own computer. A recent survey found that around 4 million older people in the UK had Internet access, the majority of which were women. Research in the US found the main reasons older people had not accessed the Internet were lack of knowledge and lack of access.

There are significant barriers to older people using ICTs. Purchasing ICT equipment for use in the home can be expensive, and many older people will have difficulty travelling to public access facilities. Some older people may find the technology complicated to use, and may have difficulties picking up new skills. Furthermore, difficulties associated with old age such as deteriorating eyesight and arthritis may make it physically difficult to use ICTs. Age Concern have produced guidelines for web developers to ensure websites are accessible to older people, emphasising the use of plain text and backgrounds, reasonable sized text, simple language, consistent layout and the avoidance of certain colours in close proximity. Further information about creating accessible and usable websites is provided in Chapter 6 of this report.

Age Concern is actively working to increase Internet access for older people, and has developed a network of ‘Age Resource Desks’ providing access and training on ICTs for older people. Further information is given in Box 4.3.

**Box 4.3: Age Concern: Age Resource**

Age Resource, a division of Age Concern, aims to encourage older people to recognise their potential and to increase the opportunities available to people in later life. A large part of Age Resource’s work involves getting older people involved with ICTs.

The Age Resource Desk Network offers computer access and training exclusively for the over 50s within local Age Concern groups. The desks are run by volunteers and provide Internet access, computer ‘taster’ sessions and data and links to information likely to be of interest to older people. There are currently over 60 Age Resource Desks providing Internet access throughout the country. For older people that are unable to access an Age Resource Desk, Age Resource operate ten mobile schemes that take ICTs into older people’s homes, nursing homes and other strategic locations. Age Resource also provide a free booklet entitled ‘Grasp the NETtle: A beginners guide to the Internet’, a very comprehensive and user-friendly guide to accessing the Internet.

In 1999, Age Resource launched the Baby Boomer Bistro, an Internet chat room for the over 50s. The site now has over 3,200 registered members, most of whom live in the UK. Around 50% of members are thought to be in their 50s and around 40% are over 60. The Baby Boomer Bistro site also provides an events calendar announcing website events and links to other relevant and interesting websites. Many older people with disabilities or facing social exclusion have found the Baby Boomer Bistro has enabled them to communicate with the outside world and overcome some of their everyday problems.
The potential for using ICTs to reach older people for health purposes will increase as the percentage of older people with Internet access increases. Research has shown that older people are just as interested in and just as adaptive to the Internet as younger generations\(^35\), and that amongst older people that are currently using the Internet, health information is one of the more frequently searched for subjects\(^36\). However, Internet access levels are relatively low amongst older populations. Consequently, the use of ICTs to disseminate health information to the elderly may require an intermediate group such as one with good Internet access and also working with older people. Such groups could either relay information or help develop access skills in the elderly. A selection of existing online resources regarding older people and health is provided in Appendix 2.

4.3.3 Young People

For many of today’s young people, there is nothing new about ‘new’ technology. Computers are a normal part of life, the Internet is great for playing games and getting help with homework, mobile phones are essential fashion accessories and text messaging the usual method of communication between friends. Three quarters of British children aged between 7 and 16 have Internet access\(^37\), and 87% of young people aged 16-24 have accessed the Internet\(^31\). Nine out of ten 17-18 year olds in the UK have an e-mail address\(^38\), and 99% of higher education students have accessed the Internet\(^39\). Over half of young Internet users are thought to be using the Internet on a daily basis.

Despite the fact that young people today have access to more health information than ever before, the prevalence of health risk behaviour such as drug use and binge drinking is increasing\(^40\). Often, young people show little interest in traditional health promotion initiatives and are unresponsive to information about health consequences. However, young people are captivated by interactive technologies such as the Internet which can offer innovative methods of engaging young people in health awareness activities. A survey undertaken among 15 to 24 year olds in the US\(^41\) found that 95% of respondents had Internet access, of which 75% had used the Internet for finding health information. The most popular health topics for which online information was sought were diseases such as cancer and diabetes and sexual health issues (see Figure 4.3). However, health information found on the Internet was the least trusted by young people, with information from doctors, parents, school and friends being more valued. Research has found that health initiatives

![Figure 4.3: % of 15-24 year olds in the US having used the Internet to find health information on...](image-url)
with interactive and peer-led aspects to be most successful amongst young people, and ICTs offer a perfect environment for developing such initiatives.

The high levels of ICT use by young people indicates they could be effectively targeted through ICTs for public health purposes. ICTs can offer the perfect opportunity to seek health advice due to their anonymity - teenagers with ‘embarrassing’ pubescent problems, substance use problems or concerns about sexual health may be more inclined to seek advice if the need to meet a health professional in person is removed. Sexual health problems and substance use are most prevalent among young people (see Table 4.2), and ICTs are now widely used to provide information and advice on these issues. DanceSafe, a harm reduction agency in the US, runs a website providing a wide range of information on dance drugs and promoting health in nightclubs (www.dancesafe.org). The site contains a large discussion area for clubbers and professionals to exchange ideas, and the nature of the topics discussed often lead to very important public health issues being raised such as the dangers of poly-drug use. Such a service can also act as a sentinel to quickly circulate information about for instance a potentially dangerous drug known to be in circulation.

| Table 4.2 Sexual behaviour and substance use among young people |
|---------------------|-----------------|-----------------|-----------------|-----------------|
|                      | 16-19 | 20-24 | 25-29 | General Population |
| 2 or more sexual partners in year before survey (1999) | 28%  | 36%  | 26%  | 12% (a) |
| Taken drugs in the year before survey (2000) | 27%  | 30%  | 20%  | 11% (b) |
| Prevalence of cigarette smoking (1998) | 31%  | 40%  | 35%  | 27% (c) |
| Estimated usual weekly units of alcohol consumed (1998) | 23.9 (d) | not available | 18.0 (c) |

(a) all = 16-69  (b) all = 16-59  (c) all = 16 and over  (d) age 16-24

Email offers the potential to provide a more personal service to young people who may have issues that they are unwilling to discuss openly. Box 4.4 provides information on an email helpline provided by Youth2Youth which has been widely used by young people with personal problems.

**Box 4.4: Youth 2 Youth**

Youth2Youth is a telephone and e-mail helpline for young people run by Ealing Youth Counselling and Information Service (part of Ealing Youth Service and MIND, a mental health charity). The service trains young volunteers between the ages of 16 and 21 to provide confidential support to young people under the age of 19 with emotional problems. The problems dealt with by the service range from relationship issues to serious mental health issues. Young people requiring additional assistance are given details of local services specific to their problems. The service has been promoted through listings in national teen magazines, advertising in a magazine distributed to schools and creation of posters and credit-card sized flyers. To date the service has received and responded to 1,260 emails and the Youth2Youth website has received over 17,000 visits.

Although young people can be reached via ICTs, this is not to say that a website aimed at young people will be a guaranteed success. Young people are the most web-
wise population and keeping their attention can be difficult. Moreover, there are thousands of established web sites aimed at young people that are competing for their attention. Websites hoping to attract and sustain young people need to be fun, up-to-the-minute and hold quality information. Before designing a site that may be utilised by young people, health professionals should undertake extensive consultations with their target group and sample existing sites popular with young people. Some research companies hold demographic information on young people’s use of the Internet but often charge for this information.

Most health-related activities undertaken through ICTs to date have used either websites or CD Roms to reach their target audience. However other ICTs such as digital TV and mobile phones could be particularly effective in reaching young people. Over half of young people in Britain currently own a mobile phone with ownership amongst some populations being even higher, and text messaging is one of the most common forms of communication between young people. Mobile phones have been used in Finland to provide estimated blood alcohol content via text message to people who are considering driving after drinking alcohol and in Switzerland to provide supportive messages to people trying to quit smoking (the user sent a one word message to the service and received one of around 60 supporting replies).

There are problems associated with the use of ICTs by young people and particularly children, the best known probably being the use of chatrooms by paedophiles. The government has launched a campaign to protect children whilst using the Internet, investing £1.5million in newspaper and magazine advertising to urge parents to help children participate safely in online chatrooms. A booklet advising parents on safe use of the Internet by their child is available on the campaign’s website - www.wiseuptothenet.co.uk.

Other concerns that have been raised regarding increased use of the Internet by young people include obesity, injuries and depression. Obesity in children is connected to excessive television viewing (of five or more hours a day) and although there is as yet a lack of research into the link between computer use and obesity, a similar association may exist as television viewing and computer use are both sedentary activities and increased use could possibly displace more energetic pursuits. A popular reason for using the Internet is to play games and while research has suggested links between computer games and epileptic seizures, it is also believed that prolonged use of computers will cause injuries to children similar to those reported by adults, such as back pain, eye strain and musculoskeletal disorders such as those known as ‘repetitive strain injury’. Teenagers have been found to have decreased communication with the family and increased depression following uptake of Internet use. However, positive outcomes of Internet use amongst children include better academic performance and computer literacy.

Disadvantaged young people
During the development of the government’s Teenage Pregnancy Strategy, research was commissioned into the lifestyles of disadvantaged young people (aged 13-18) and the types of media and communications methods most able to reach them. The majority of young people involved in the research did not have Internet access, and most were not particularly interested in gaining access. The image of the Internet was relatively poor, being negatively associated with school and pornography, and those
who did have Internet access used it mainly for visiting gossip sites, chatrooms and entertainment sites. Most young people involved in the research, however, had access to digital TV either in their own homes or through friends or relatives and many had a mobile phone, suggesting that organisations wishing to reach disadvantaged young people for public health purposes may consider developing initiatives around these alternative access technologies. Some organisations do provide free Internet access specifically for disadvantaged young people, such as YouthNet UK which provides ‘Surf-it’ web points for disadvantaged people in drop-in centres throughout the UK (www.youthnet.org.uk/surfit.html). In the short term such organisations offer one potential group through which public health initiatives using ICTs can contact disadvantaged young people.

4.3.4 People with disabilities

There are over 8.5 million people in the UK with a disability, and whilst ICTs would offer huge potential to this population, research conducted by Research Surveys of Great Britain (RSGB) found that only 28% of disabled people had Internet access compared with 44% of the general population. Research in the US found that much lower proportions of people with work-disabilities (a disability that limits a person’s ability to work) had home computers and Internet access than amongst the general population (see Figure 4.4).

The Internet, digital TV and mobile phones can enable people with disabilities to communicate more effectively and become less excluded from everyday life. These technologies can be used to order necessities that can be delivered direct to the doorstep, to access an increasing range of services, to search for information, meet new people and to communicate with professionals for information and advice. People may also find that new technologies can help overcome some physical disabilities that have prevented them from participating in everyday life. For example, people that have difficulty using their hands may be able to use voice recognition technology to perform a number of tasks independently such as writing letters.

Many people with disabilities are able to use ICTs in the standard way. For others, however, adaptive technologies are available that can overcome barriers to use caused through their disability. For example, people with sight problems can alter the size and colour of text and alternative keyboards can be used to overcome a wide range of disabilities. Keyboard and mouse emulators are available that allow people to operate computers using movements of the body or through breath alone. Many such technologies are available free or at low cost, and perhaps the most limiting factor to the use of ICTs by disabled people is lack of
Individuals with disabilities are often unnecessarily excluded from websites by their design, and health organisations in particular should be aware of usability issues that ensure websites are accessible to everyone. Recent research by Mencap (a learning disability charity) and Nokia (a communications technology developer) found that many websites were not designed to be accessible to people with learning difficulties. Similarly, research by Aspect Internet found that 94% of FTSE (Financial Times Stock Exchange index) listed companies and over a fifth of major UK companies had websites that were inaccessible to disabled people. Major problems included font size, colour schemes, awkward navigation and no visible methods of using the sites without a mouse. Several web accessibility guides have been developed to help web developers create sites that can be used by disabled people, more information on which is provided in Chapter 6. The Centre for Applied Special Technology (CAST) has developed an online website accessibility tool called Bobby which assesses web pages for accessibility and informs developers of ways in which they can improve their site.

A selection of existing websites covering disability issues are listed in Appendix 2.

4.3.5 Sexual Health

The anonymity of ICTs makes them ideal for use in disseminating sexual health information. Many people feel uncomfortable approaching health professionals about sexual health problems, and young people exploring sexual health issues may prefer to do so privately rather than discuss matters with adults or peers. A great deal of sexual health information is already available online, and as ICT use becomes more widespread the use of new technologies for gaining sexual health advice and information is likely to increase.

Sexual health issues most commonly affect younger people, who are the most web-wise and the most likely to have access to the Internet. In the US, one study found that over a quarter of adolescent girls had used the Internet to find information on sex, whilst a different survey found half of respondents (aged 15 to 24) had used the Internet to find sexual health information on issues such as pregnancy, sexually transmitted diseases and AIDS. In the UK, a survey undertaken in five Genito-Urinory clinics in England found that 41% of patients had Internet access, of which 10% had used the Internet to find out about their sexual health problem. Many more said they would be interested in using the Internet for sexual health information, would use the Internet to find information on GU clinics and to make appointments, and would be happy to get test results over the Internet. Nearly a quarter of those making optional suggestions recommended the development of an interactive website. Internet use has increased significantly since this research took place in 1999 and with it the opportunities it presents. Such opportunities were recently illustrated in an outbreak of syphilis where one case presented at a GU clinic after self-diagnosing using the Internet.

A major problem with using the Internet for sexual health, particularly for children, is the huge quantity of pornography that can be found when the word ‘sex’ is entered.
into a search engine. One survey found that 70% of young people had ‘accidentally stumbled across pornography online’ and that 19% of these had been ‘very upset’ by the experience. However, there are a growing number of sites provided by established organisations such as Health Promotion Agencies offering useful information on sexual health and local services (see Appendix 2), and effective promotion and links could encourage young people to visit such sites directly when looking for sexual health information rather than using a search engine. Some schools, parents and libraries use filtering software to prevent children accessing unsuitable websites, yet unfortunately these can also prevent users from accessing genuine sexual health websites. Almost half of respondents in a US study reported having been prevented from accessing a non-pornographic site by filtering software.

The placing of sexual health information on the Internet requires some thought. Without care information providers may find their website exposes young people to information they find disturbing or upsets parents, yet by restricting information the site may not achieve its objectives. The home page of a sexual health website should clearly inform visitors of the nature of information provided on the site and who it is aimed at, and the site should be structured to enable users to make informed choices about what information they access. This should minimise the chance of people accidentally accessing sexually explicit material whilst allowing for a wide range of useful and honest sexual health information to be included on the site.

Box 4.5: Avert

| www.avert.org.uk |

AVERT, a UK based charity for AIDS education and medical research, developed a website providing information on AIDS and HIV in 1995, which is today the most used AIDS website in Europe – throughout 2000 the site was used by an estimated 1.5 million users who between them generated 30 million hits and downloaded 2 million pages of information. The site provides a huge amount of information on AIDS and HIV, including infection, testing, statistics, treatment, protection and latest news. The site contains a quiz covering AIDS issues and also provides an email information service which can provide factual information (but not information on personal circumstances). The AVERT website links to a range of relevant websites and telephone helplines where site users can get further information on issues surrounding HIV and AIDS.

4.3.6 Diabetes

In the UK, around 1.4 million people are diagnosed with diabetes (about 3 in every 100) and it is estimated that a further million people have diabetes but do not know it. The prevalence of diabetes increases with age, with the average age at diagnosis being 51 for people with a family history of diabetes and 52 for people without. There are thought to be around 20,000 young people under the age of 20 with diabetes in the UK, most of whom are insulin-dependent. Diabetes is three to five times more common among ethnic minority populations. The number of individuals with diabetes is expected to have doubled by the year 2010 - a major factor in the growth in diabetes is that people are increasingly overweight and less active.

Although groups such as ethnic minorities and older populations are less likely to use ICTs than other groups, with around half of all adults in the UK having accessed the Internet, many diabetics will have Internet access and are likely to be using the Internet to find health information. One study into the use of the Internet to find
diabetes information found more respondents were friends and relatives of diabetics than were diabetics themselves\(^{76}\), suggesting that the audience for online provision of information on diabetes would be particularly large. ICTs also have the potential to target younger groups with information and advice on diet and exercise to reduce their risk of developing diabetes in later life. There is thought to be a link between an increase in sedentary activities such as computer use and incidence of obesity\(^{52}\) - a factor associated with increased risk of developing diabetes\(^{77}\). The first known cases of type 2 diabetes in white adolescents have recently been reported in Britain, with all four diagnosed diabetics (aged 13-15) being associated with significant obesity\(^{78}\). With growing levels of childhood obesity in the UK, such cases are likely to become more prevalent.

The Joslin Diabetes Centre in the US conducted a 21-month research study into Internet discussion groups about diabetes\(^{79}\), finding that most users were over the age of 30 and that more women than men used the groups. The most popular topics amongst users were those concerning food and diet, while around a fifth of messages posted concerned providing or receiving emotional support. Four out of five respondents believed their participation in the discussion group had improved their ability to deal with diabetes. One user remarked “I’ve had diabetes for 15 years and after being online with Joslin for 15 minutes I have found out more about my condition than I ever learned from by diabetes doctor”. Research by Cyberdialogue (www.cyberdialogue.com) found that people with chronic diseases who use the Internet to find disease information take their medication more regularly after visiting a website about their disease\(^{80}\). This suggests that as well as educating people about specific health conditions, the Internet is also capable of motivating patients\(^{79}\).

There is a wide range of information on diabetes available on the Internet and a number of organisations have developed good quality websites aimed at providing information on diabetes and related issues to both health professionals and the general public. A major UK-based diabetes website is that provided by Diabetes UK, briefly outlined in Box 4.6.

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<thead>
<tr>
<th>Box 4.6: Diabetes UK</th>
<th><a href="http://www.diabetes.org.uk">www.diabetes.org.uk</a></th>
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<tbody>
<tr>
<td>Diabetes UK (formerly the British Diabetic Association) is a national charity funding research, campaigning and helping people to live with diabetes. The organisation runs a website providing a wide range information on diabetes aimed at both health professionals and the general public. Examples of resources available online include care recommendations, statistics, fact sheets, information about living with diabetes, latest news, research updates and links to other relevant websites. All information is accredited before being included on the website. The Winter 2000 edition of Update, Diabetes UK’s magazine, included an article on ‘safer surfing’ to assist people in critically evaluating online health information, available in the magazine’s archived issues section on the website.</td>
<td></td>
</tr>
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Diabetes also appears to have received particular attention in initiatives and research into the use of ICTs to improve health. In the US, a trial is being undertaken looking at potential use of the Internet in the care of diabetic patients\(^{81}\). Rural and inner-city patients in New York have been given free computers, Internet access and health monitoring equipment, with which they check their blood sugar level and blood pressure and regularly send data to be analysed on a secure website. If the patient’s data are outside an acceptable range an automatic alert is sent to a health professional.
The patient also receives electronic information on managing diabetes, and a camera connected to their computer allows doctors to assess their conditions from home. The programme prevents people from having to visit their doctor frequently and allows more regular monitoring of patients. It is thought that, although expensive in the short run, this initiative will prevent problems such as renal failure in later years and in the long run will be a more beneficial, cost-effective method of treating diabetic patients.

ICTs provide a valuable platform for providing public health information to people with diabetes and their friends and family, and importantly have the potential to target those individuals that are at high risk of developing diabetes in the future. A selection of online diabetes resources is provided in Appendix 2.

4.3.7 Mental Health

Around one in four people will develop a mental health problem at some time during their life. Some mental health problems are more likely to affect individuals from lower Internet access groups; for example the prevalence of schizophrenia increases with age, whilst children from low income households are more likely to suffer from mental health disorders. Other mental health issues, however, affect mainly people from higher Internet-using groups such as young people. Most suicides, for example, are committed by men aged between 25 and 34, while three teenagers are thought to self-harm every hour.

There is a stigma associated with mental health that may prevent people from accessing services for professional help, and in this respect ICTs have great potential for disseminating mental health information. The anonymity of ICTs may encourage people with problems or those worried about friends or relatives to seek information and advice online rather than visit a health professional. A survey conducted by the mental health charity Mind found that whilst only one in four people with mental health problems had access to the Internet, more of those that did use the Internet believed overall it had a positive influence by reducing feelings of isolation.

As well as providing access to a wide range of mental health information, there are several other ways in which ICTs can be beneficial to mental health. Online counselling, for example, is increasing whereby people can anonymously seek advice, support and information without having to meet a professional face-to-face. In the UK, the Samaritans (a charity helping people who are suicidal or depressed) have a website providing information on suicide and depression which also offers an email advice and support centre. In the year 2000, the service received 37,000 emails, over half of which were from women, a quarter from men and the gender was unknown for the remainder. Over half of emails were sent by people who felt suicidal at the time of writing. The organisation has recently launched a new website which allows the user to ‘turn off’ the Samaritans logo to offer site users greater discretion when accessing the site.

Other methods of using the Internet for mental health purposes include online group counselling whereby group members can communicate under the supervision of a health professional without having to be in the same place at the same time; and online support groups in which people can meet others with similar problems or with relevant experiences and exchange information and support. The Internet may also enable health professionals to reach people with mental health problems who have
previously been hidden. A study in the US looked into potential use of the Internet for screening the public for depression. An online screening test was posted on a large health information website (www.intelihealth.com) which was completed almost 25,000 times during an eight month period. Over half (58%) of respondents screened positive for depression, of which just under half (47%) had never been treated. This study illustrates the potential of the Internet in reaching previously hidden populations.

The mental health charity MIND maintains a website providing a wide range of online resources for professionals and the general public, outlined in Box 4.7. A selection of other mental-health related websites are included in Appendix 2.

**Box 4.7: Mind**

<table>
<thead>
<tr>
<th><strong><a href="http://www.mind.org.uk">www.mind.org.uk</a></strong></th>
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<tbody>
<tr>
<td>Mind is a mental health charity operating in England and Wales, working to improve life for people with experience of mental distress. The organisation’s website offers a wide range of information on mental health issues including a series of free fact sheets, most of which can be downloaded by site users. The site provides contact details and addresses for local Mind associations and charity shops throughout England and Wales, plus information on campaigns, fundraising, government policy and much more. The site also contains a ‘bookshop’ stocking mental health publications from around the world – customers place a ‘tick’ by the publication they want to purchase and an order form is created for them which can be printed off and posted to Mind with payment. An email alert service is available through which site users can request notification when a particular page gets updated.</td>
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### 4.3.8 Smoking

The White Paper *Smoking Kills* confirmed smoking as a priority area for health in the UK and obliged local health services to develop smoking cessation services for their populations. The prevalence of smoking in the UK is highest amongst younger populations with 40% of 16 to 24 year olds smoking, compared to 27% of the general population. With 88% of 16 to 24 year olds having accessed the Internet, a very rough estimate would suggest that even if every non-Internet user was a smoker, over two-thirds of young smokers have used the Internet. Smoking is also most prevalent amongst individuals living in low-income households, with 37% of people from low-income households being current smokers compared to around 21% from high-income households. Low income households are less likely to have access to the Internet and may be more difficult to reach online. Certainly, existing online smoking initiatives have found users to be middle to upper-middle class, younger and more educated. However, low income households are often the greatest watchers of TV and therefore digital TV, a developing technology with less of a social gradient, may provide an effective channel of reaching smokers for health purposes.

Over 80% of smokers start smoking as teenagers and it is thought that around 450 children in the UK start smoking every day. In the US, a study has used an Internet chatroom to try to promote teenage smoking cessation amongst high-risk groups. In this intervention teenagers (recruited in rural schools) participated in seven hour-long chat sessions with a professional smoking cessation counsellor and other teenagers. The teenagers volunteered to take part in the study, continued their participation

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1 Low income equal or below £7,186.00 annual household income; high income above £27,705.00
22% of men and 21% of women
throughout the study period and rated the intervention positively. The study also found positive changes in the participant’s smoking behaviour, including self-reported abstinence, reduced amount smoked and increased intention to quit.

It is thought that over 70% of smokers want to give up\textsuperscript{93}, and yet for some people the fear and shame associated with failure may be enough to prevent them from trying\textsuperscript{91}. The Internet and other ICTs provide an anonymous way for people to gain support and advice and even follow a smoking cessation programme without the pressure of meeting people face-to-face. QuitNet (www.quitnet.com) is a US-based website created in 1995 that aims to help people give up smoking via the Internet. The site has over 38,000 registered users, of whom 60% are women, 57% are aged between 25 and 44, and 92% are white. Rather than just providing information to users, the site provides many interactive facilities, such as questionnaires, email support and a ‘tracker’ to let people know how much money they have saved since quitting. The site’s message board and chat system provides an online community where people at various stages of the quitting process offer each other advice and support. This is probably the most popular area of the site, with thousands of messages being posted every day. In the UK, Quit (www.quit.org.uk) a charity that aims to help people give up smoking, has a website providing plans for stopping smoking, information on products to help people quit and more. The website runs in conjunction with the national ‘Quitline’ telephone service (0800 00 22 00).

The growing use of mobile phones and email also offers a unique opportunity for health organisations to helping people quit smoking through providing messages of support and encouragement. Such a service was provided by the Internet company MyAlert.com to smokers who quit at New Year in 2001\textsuperscript{95}. Daily text messages were sent to 7,000 quitters in five European countries, for example "Quit! Two whole days without smoking. If you feel the craving, get up earlier, finish your showers with cold water, don't eat too much, and drink lots of water"\textsuperscript{96}. A similar service has been run in Switzerland whereby people trying to quit send a one word message to the service and receives one of several automated replies\textsuperscript{50}.

There is a great deal of smoking-related information and assistance and advice on giving up smoking already available online. Box 4.5 outlines some of the information available on the Action for Smoking and Health (ASH) website. Further online resources regarding smoking are included in Appendix 2.

<table>
<thead>
<tr>
<th>Box 4.8: ASH</th>
<th><a href="http://www.ash.org.uk">www.ash.org.uk</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Smoking and Health (ASH), an organisation that seeks support for the development of a comprehensive programme to tackle tobacco-related disease, maintains a website providing a great deal of information on smoking issues. This includes statistics, evidence on health issues and information on tobacco policy, taxation and smuggling. The ASH website also provides a number of lesson plans for use in schools covering different smoking issues and involving role-plays, exploration of websites, debate and development of personal skills. Information and tips on giving up smoking is accompanied by links to smoking cessation websites and freephone helplines.</td>
<td></td>
</tr>
</tbody>
</table>
4.4 Summary

New technologies are creating new opportunities for disseminating public health information and advice to the general population. Members of the public that have access to ICTs have the potential to gain significant benefits to health through their use, having 24-hour access to a diverse range of health information which can enable them to take control of their own health. Many individuals are already using the Internet for health purposes, with health being one of the most frequently searched for subjects on the Internet, and as the percentage of the population using the Internet increases the role of ICTs in disseminating public health information is likely to strengthen.

Due to the current digital divide, some population groups and health topics are more appropriate to be targeted through ICTs than others. In particular, health issues that effect population groups with high levels of access to and use of ICTs, such as young people, are already particularly well suited to initiatives using new technologies. However, other population groups such as ethnic minorities do not have such high access to ICTs but could benefit most using new technologies to overcome barriers to traditional health initiatives such as culture and language. The case studies provided in this Chapter indicate that many organisations are already taking advantage of the benefits of ICTs to reach their target audience. Equally they illustrate that for each group specific needs require addressing and different obstacles arise in reaching target populations. Many organisations are now successfully providing access to information and advice on the Internet and a few have already utilised alternative access devices such as mobile phones. For public health work through the Internet the potential is only beginning to be realised in the UK and the opportunities that new access platforms will provide are only now being considered.

More evidence is needed on the effectiveness of initiatives using new technologies to reach the general public for health purposes, and evaluation needs to be considered as an essential part of ICT initiatives in order to develop an evidence base of good practice. The ability of ICTs to provide access to a huge range of diverse public health information and enable rapid communication is likely to ensure that the Internet and other new technologies play an important part in health improvement and public health information dissemination in the near future. However, until universal Internet access and use is a reality, health organisations that use ICTs for disseminating public health information should always ensure that this information can also be accessed through other media to prevent increases in health inequalities.

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Chapter 5

Preparing for the Future

5.1 Introduction

If anything, the pace of technological change is accelerating. In general, most individuals, businesses and communities are learning to adapt quickly to these changes but some are being marginalised through either lack of access or expertise. However, for many people the way we communicate and work today is vastly different from even a decade ago, and in another ten years will be considerably different again. New technologies such as Digital TV and broadband Internet are already available and in use in the UK. The full extent of their use and impacts on society are yet to be realised and the government is developing the role of both these technologies and their use by individuals, organisations and businesses. The intended switchover from analogue to digital TV by 2010 should ensure digital is a widespread technology, whilst the high quality of broadband services should ensure voluntary adoption by large proportions of ICT users once access problems and high prices have been overcome (see Section 5.2).

It is difficult to predict what future technologies will look like and what impact they will have on public health - continuous developments may mean that technologies hailed today as ‘the next big thing’ may simply fade into insignificance as new and improved technologies emerge. However, we are already on the verge of a ‘mobile’ future, where rapid data transfer and online communication can be conducted from anywhere at anytime. Third Generation (3G) mobile looks set to be the next major technology to break into world markets, with the first 3G service having been launched in Japan in late 2001. New technologies will have (and are already having) a large impact on public health and the delivery of health care, and developing technologies are likely to play an even greater role in the future of health in the UK.

This chapter provides information on Digital TV (also discussed in Chapter 1) and broadband as two technologies that are likely to have significant impacts in the near future. A brief outline of 3G is also given as an emerging technology with potential for widespread use in the future. A comprehensive analysis of future technologies is beyond this report but, based on limited existing evidence, this chapter examines possible benefits and uses of new technologies for public health purposes.

5.2 Digital TV

Digital TV is already a reality in the UK, with almost half the population (44%) having accessed digital TV at home by January 2002 (for greater information on digital TV penetration and a brief explanation of how Digital TV works see Chapter 1, Section 1.8). The government is planning a national switchover from analogue to digital between 2006 and 2010, which should ensure almost universal access to digital TV – already the technology is less discriminating than the use of computers to access the Internet (see Section 1.7.1, Chapter 1). Television is a familiar and unthreatening technology used by most of the population of the UK, and users do not need any specialist skills, with online information being accessed usually through a TV remote control.
Digital TV users have access to a range of interactive facilities provided by their digital supplier which are accessed via an interactive ‘home’ page on their TV. Users of cable digital TV, for example, can select what interactive resource they want to access from a list of headings such as ‘news’, ‘shopping’ and ‘games’, and will be provided with a number of ‘sites’ under each of these headings. These sites have been specifically adapted for digital TV and are often simplified versions of websites accessible via PC. The World Wide Web can be accessed through digital TV (usually for around £5.00 per month\(^8,9\)), although many websites are awkward or impossible to use as they have not been designed to operate via this medium. Content developed in common computer web development programmes such as Flash cannot be viewed through digital TV. Furthermore, files in common formats such as (Microsoft) Word or pdf (portable document format) cannot be opened. As much public health information is available on the web in these formats (including most national documents) currently they cannot be accessed through digital TV.

At present, those with access to digital TV rarely utilise the Internet or other interactive features available to them - only 15% of digital users claim to use their TV for sending and receiving emails, whilst only 10% use their TV to access the Internet\(^6\). Research undertaken for Oftel\(^10\) found that many digital TV users had little interest in accessing the Internet through their TV – watching TV was seen as a social and relaxing activity, a passive activity that should not require a response. The idea of using the TV for activities such as sending e-mails, online banking and shopping was largely frowned upon, with most digital TV users preferring to undertake such activities through a PC. Moreover, in multi-person households use of interactive TV facilities was often seen as being selfish and inappropriate. However, for a small number of people, mainly older people without ICT skills, digital TV was considered an ideal way of accessing online services without having to learn new skills or invest in complicated technology. Most digital TV users involved in the research had encountered technical difficulties with interactive services, while the most common complaint was about very slow operating speeds.

Growing use of digital TV should encourage content developers to strive to improve interactive services and motivate government, commercial and voluntary organisations to develop appropriate content. This should in turn encourage more digital TV subscribers to use interactive services. Health organisations should take into account the penetration of digital TV when developing online services and consider ways of making web content accessible via digital TV. There are several design issues to consider when developing a website to operate effectively through digital TV, examples of which are outlined in Box 5.1.
For a website to be accessible to users of digital TV, there are several design issues that need to be taken into account. These include:

- As a television screen is developed to be viewed from a distance and at a smaller viewing angle than a computer screen, text size will need to be increased and typeface may need to be changed to suit the resolution of the television screen;
- A television screen is designed for moving images, and therefore horizontal lines and fine detail that work on computer screens may flicker when the television screen is static;
- Colours may not appear the same on a television screen as on a computer screen;
- ‘Plug ins’ such as Flash and modern HTML tools are unlikely to work through current digital TV set top boxes;
- Currently, only basic selection devices are used with digital TV, which means image maps, navigation that requires a real pointing device (i.e. mouse) or any page containing more than six or eight hyperlinks should not be used.
- All existing digital TV providers use different Application Programme Interfaces for their set top boxes (Telewest and NTL use Liberate; Sky uses Open TV), and therefore there are likely to be compatibility issues when attempting to provide content over a variety of digital TV channels.

The government has developed Framework Policy Guidelines for Digital TV providing advice to public sector organisations on the development of digital TV and its use for communicating the public. These guidelines are currently being updated. The original guidelines are available on the e-Envoy website (www.e-envoy.gov.uk).

### 5.2.1 Digital TV and Public Health

The less disparate penetration of digital TV suggests the technology may provide significant potential for improving health and reducing health inequalities in the UK. In 1996, 99% of adults in the UK reported watching television as a leisure activity which indicated that the intended switch from analogue to digital TV by 2010 would give the majority of the population the opportunity to access interactive and online services. Already, as a platform for providing the general public with access to public health information, digital TV can potentially reach members of society that are excluded from other ICTs and that stand to benefit most through public health initiatives.

Some initiatives that use digital TV for providing health information already exist, including Telewest’s Living Health project which provides access to a wide range of accredited health information through users’ television sets (see Box 2.6, Chapter 2). Living Health has also shown digital TV’s potential in providing the public with access to services, enabling viewers to locate local or specialist services, find contact details and service information and in some cases even book appointments. The success of the Living Health pilot provided by Telewest has shown that people will use their digital TV to find health information if the services available to them are relevant and provide real value.

Interactive facilities available through digital TV could potentially provide health organisations with opportunities to target relevant populations with public health information. Several television programmes such as documentaries and soap operas that cover topical issues provide telephone numbers and/or web addresses for viewers to access more information or advice about the issue. Digital TV could prove an
equally if not more effective channel for providing such information, removing the need to move away from the TV and access a computer or telephone with instead a push of a button on the TV remote taking viewers to the relevant information. More television programmes and advertisers are making use of interactive facilities by encouraging viewers to ‘press the red button now’ for more information – with the red button on the viewer’s remote control taking the user to further information on the subject or product through their TV screen. Public health organisations could link in with interactive content providers and use similar methods to provide information on public health issues, which could be particularly useful for targeting issues that effect difficult to reach populations such as teenage pregnancy or substance misuse.

The Department of Health has recognised the importance of digital TV in providing health information, and given the expected mass access to digital TV it is likely to become an important method of disseminating and acquiring public health information in the near future.

5.3 Broadband

Most Internet users in the UK currently get online via a phone line and a standard modem. This method of accessing the Internet can often be slow and frustrating – it has been estimated that Internet users spend around a third of their online time just waiting. Broadband technology, however, allows data to be transferred at much higher speeds, making the Internet ten to forty times faster to use (with the potential to go even faster). Broadband refers to high bandwidth communications channels (see Box 5.2) capable of transferring data at a much faster rate than is possible through traditional narrowband channels. This paves the way for an entire new range of online services, such as video-on-demand and video conferencing, and allows several tasks to be performed at once without a reduction in operating quality. Broadband is expected to bring about much higher connectivity amongst Internet users - in the US, broadband users are spending an average of four times longer online than those using slower, narrowband services. By ending the so-called World Wide Wait, broadband has the potential to make the vision of an on-line society a reality.

<table>
<thead>
<tr>
<th>Box 5.2 Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bandwidth of a communications channel refers to its capacity to carry information. The amount of data that can flow through a channel depends upon the width of the channel. Therefore the wider, or broader, a communications channel is the more data it can carry and the faster the information will reach its destination. In the UK most Internet connections are currently made using low bandwidth, or ‘narrowband’ communications channels with slow data transfer speeds. However, high bandwidth, or ‘broadband’, services are becoming more popular and more accessible. The advantages of broadband services include rapid Internet connections and download speeds of ten to forty times faster than the current norm and constant connection to the Internet.</td>
</tr>
</tbody>
</table>

In the UK, broadband services have only relatively recently become available and have been slow to take off, although take up is now growing substantially. As of November 2001, 3% of Internet users claimed to be using broadband services, representing an increase of more than 500% in one year. Experts estimate that between 22% and 37% of households in the UK will have broadband Internet connections by 2004. In November 2001, 6% of UK business reported using broadband, an increase from 3% in May 2001. The government believes broadband
will play a large role in Britain’s future competitiveness in the global market, and as part of it’s UK Online strategy has set the target of ensuring the UK has ‘the most extensive and competitive broadband market in the G7 by 2005’\(^{18}\).

There are various ways of getting broadband connection to the Internet. Currently, the main two options are through Asymmetrical Digital Subscriber Line (ADSL), an ‘always-on’ high speed Internet service available provided through telephone lines, or via cable modems, not as fast as ADSL but currently the cheaper option\(^{22}\). Broadband services, however, are not yet universally available, with availability depending upon area of residence – only around 60% of UK households have access to ADSL services, whilst cable modems are available about 38% of households\(^{21}\). Rural residents are likely to be excluded from both these broadband services due to their likely distance from local telephone exchanges and the increased costs to cable companies of providing cable networks in remote areas\(^{23}\).

In addition to these options, broadband fixed wireless access (BFWA) is available on a limited basis in some parts of the country\(^{21}\), providing broadband through radio links between a base station and an aerial on the user’s premises\(^{22}\). Licences to provide BFWA were initially auctioned in December 2000 but attracted little attention with less than half the available licences being sold. A second auction for the remaining licences began in October 2001 and will end in October 2002\(^{24}\). Broadband is also available via satellite, although satellite services are currently very expensive. As of February 2002, BT Openworld’s satellite broadband service cost £69.99 per month with an installation charge of £899.00\(^{21}\). The service is currently on trial in Scotland, and is shortly expected to be available to the rest of the country.

Future expansion of broadband access combined with decreasing prices should increase broadband use in the future, although it is estimated that by 2003, 15%-20% of the population will still be excluded from broadband due to their physical locations\(^{18}\). Map 5.1 shows broadband coverage in the UK as of August 2001. Although it appears that all areas of the UK are covered by some level of broadband access, in reality satellite broadband is not yet an affordable option for most individuals and many small businesses and currently therefore is only likely to be used by bigger organisations.
Map 5.1 shows that access to broadband services is very unequal throughout the UK – whilst residents in some areas have several different access methods available to them, large tracts of the country are only able to access broadband services via satellite which is unlikely to be an affordable option. Difficulties with broadband service provision could mean that broadband actually increases the digital divide, particularly between urban and rural residents. This likely to be the case especially if web sites and ICT products are developed that require broadband in order to use them properly. In the immediate future the ‘broadband revolution’ is being restrained by access inequality, although hopefully this will alter in the near future.

When broadband access is affordable and available, take-up is likely to be rapid as people come to realise its advantages over narrowband Internet access. Comparisons are possible between the move from narrowband to broadband and historically the move from black and white to colour TV despite the differences in price. Box 5.3 examines population take-up of colour TV following its launch in 1967.
For broadband to reach its full potential, all Internet connections would have to be high speed. If broadband is only available or used by a percentage of the population it is likely that it will either not be used to its full ability, or that non-broadband Internet users will be less capable of accessing information as greater amounts of content is developed for use through broadband platforms and non-broadband download times increase. Inevitably this will lead to further marginalisation of more deprived groups and areas.

5.3.1 Broadband and Public Health

One of the major benefits to public health of broadband is likely to be improved access to information and rapid data transfer and communications. It is thought that
broadband will increase people’s use of ICTs by eradicating slow download speeds and hence long waits. For the general public, this would mean greater access to information at much faster speeds, making use of ICTs for accessing public health information and services less frustrating and more practical. For professionals, rapid download times, ability to transfer images and video files and watch and listen to online broadcasts, and rapid transfer of data and large files should enable them to work and communicate more efficiently and make greater use of valuable time.

Greater high speed transfer of pictures and sound should enable much wider and more effective use of applications such as videoconferencing. Videoconferencing combines telephone, video and computer technology and enables people in different locations to communicate while hearing and seeing each other through a computer screen. Videoconferencing allows people to ‘meet’ across long distances, to view evidence from the field without leaving their office, and can allow distance consultation with patients. Also, videoconferencing provides numerous benefits for distance learning, including observation of techniques, personal mentoring and participation in ‘virtual’ classrooms and conferences.

As with many ICT developments broadband will open up more information to health professionals via the web. The ability to utilise key public health tools such as population health information and evidence requires individuals being able to; access these new technologies, identify good quality information amongst millions of pages of health data and find and assess new public health evidence. Public health professionals should play a key role in developing these skills in health and other workers.

Amongst the general population broadband could play a large role in reducing inequalities in health among people who are cut off from society, such as those living in remote areas or who are housebound. Use of videoconferencing equipment in Cork University Hospital (Ireland) for example, is enabling children who need to spend long periods of time in hospital to ‘attend’ their usual classroom, interact with their teacher and classmates and continue their studies from their beds. Videoconferencing also provides the potential for people living or working in remote areas to communicate with public health professionals and to encourage networking and exchange of information with other countries. Over a short time period this should ease working on an international level (for instance between European Health Regions) allowing much greater opportunity for learning and collaboration between parts of different countries. Furthermore, it may open up greater expertise to developing countries that currently have limited access to public health resources. Thus, videoconferencing facilities have been used to conduct a ‘virtual’ conference focusing on HIV and AIDS prevention and the use of ICTs between medical students and health professionals in Australia, South Africa and Thailand.

The rapid data transfer speeds available through broadband technology provide benefits to public health that should become more apparent as the technology becomes more widely used, while broadband-enabled applications such as videoconferencing are likely to become more common and play a larger role in public health in the future.
5.4 3G Mobile

3G, standing for third generation, refers to the ‘next wave’ in wireless technology - a progression from current mobile technologies such as WAP mobile phones (wireless application protocol, see Box 1.6, Chapter 1) that will enable mobile access to broadband Internet. The world’s first 3G service launched in October 2001 in Japan, and the first 3G base station was installed in the UK in November 2001 in preparation for 3G services at home. The speed at which 3G technology can transfer data will allow people rapid access to online information, pictures, music files and video whilst on the move as well as access to a range of online services, such as banking and shopping. Table 5.1 gives a basic outline of the evolution of wireless technologies.

<table>
<thead>
<tr>
<th>Technology</th>
<th>1G</th>
<th>2G</th>
<th>2.5G</th>
<th>3G</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is it?</td>
<td>Digital technology used by today’s basic mobile phones</td>
<td>Digital technology used by today’s most advanced mobile applications</td>
<td>Emerging digital technology bringing together mobile phone, laptop PC and television</td>
<td></td>
</tr>
<tr>
<td>Features include:</td>
<td>- phone calls - voice mail - simple email messages</td>
<td>- phone calls - fax - voice mail - large email messages - web browsing - navigation/maps - new updates</td>
<td>- phone calls - fax - global roaming - large email messages - high speed web browsing - navigation/maps - videoconferencing - TV streaming - Electronic agenda - Meeting reminder</td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>kb=kilobyte, mb=megabyte</td>
<td>Original analogue voice only technology</td>
<td>10kb/second</td>
<td>64-144kb/second</td>
</tr>
<tr>
<td>e.g. time taken to download a 3 minute MP3* music file</td>
<td>31-41 minutes</td>
<td>6-9 minutes</td>
<td>11 seconds–1.5 minutes</td>
<td></td>
</tr>
</tbody>
</table>

* An MP3 is an audio track that has been compressed into a much smaller sound file and can be downloaded and played from the Internet

Whilst current mobile phone networks reserve airwaves for their users and each phone conversation takes up a certain amount of airspace for the duration of the call, 3G technology works by dividing each conversation into ‘packets’ which are labelled to indicate which conversation they belong to and are then sent separately to their destination, preventing spaces and pauses in speech from taking up airspace. This far more efficient use of airwaves enables data to be sent much faster and allows more people to use mobile networks. As 3G devices will be permanently connected to the provider’s network, email messages etc. can be delivered instantly without having to connect. Rather than paying for call time, providers are likely to charge for the amount of data downloaded or a single monthly fee covering everything.

Little research has yet been carried out into the health effects of 3G technology, although there is ongoing concern about the health risks of mobile phones in general,
including the possibility of links to cancer caused by microwaves and reports of headaches, nausea, dizziness, sleep disturbance and memory problems following use of mobiles. The development of 3G networks in the UK will require the positioning of many more base stations throughout the country, and although radiowave emissions must remain below specified safety limits, public opposition on the grounds of health may serve to hamper the roll-out of 3G.

5.4.1 3G Mobile and Public Health

The rapid data transfer speeds and mobility capable through 3G technology offer many potential uses for public health, in particular providing both the public and professionals with the opportunity to access information at any time and from anywhere. For example, an interesting feature on a radio show heard in a shop or in a newspaper read on a train may offer a web address for finding more information. By the time a person is next able to access a personal computer to use the Internet, both the web address and the issue may be forgotten. If a person has a mobile access device, however, they would have the opportunity to immediately access that information wherever they were.

3G uses broadband technology, and would therefore provide all the benefits to public health of broadband (see Section 5.3.1) including the use of videoconferencing, but with the added benefit of enabling users to undertake any activity when on the move. 3G technology would also enable public health professionals to have important files emailed from the office to their 3G device for immediate use, and by synchronising office or home based PCs and 3G mobile devices can ensure consistent schedule and contact information. Members of the public who want to access health services when away from home could use mobile location services to find and contact the nearest health service in any area. A 3G device could also be capable of linking patients and their data to local health care providers.

As yet, the full use of 3G in public health is unclear and there is no guarantee that 3G technology will become widely used in the UK but it is very likely that use of mobile devices running on this or alternative technologies will become more common in public health in the future.

5.5 Existing Mobile Technologies and Health

Although 3G technology has not yet impacted on public health in the UK, other mobile technologies are already increasingly being used by professionals. One obvious benefit of mobile communications to health professionals is the ability to contact people quickly and easily at any time. Mobile phones have already been credited with providing public health benefits in this respect. In one example, a university student arrived at hospital at the end of term with suspected meningococcal disease. Despite the fact that most recent contacts had returned to their homes in various parts of the country for the holiday, the patient was able to provide hospital staff with mobile phone numbers for all ‘household’ contacts (presumably people residing in the same halls of residence) and the hospital was able to contact all these people within just two hours.

Many mobile applications currently in use have been designed around improving patient care and more medical aspects of health. In the US, for example, a handheld application is in operation with which nurses can scan bar-coded medication and
patient data to ensure patient safety. Another example is the use of wireless technology in an attempt to increase patient compliance with treatment by sending wireless reminders to patients. Possibly the most important aspect of future healthcare that will set it apart from traditional care will be the increase in distance and home care. Using new technologies and wireless applications, patients can receive high levels of care without having to leave their own home.

The use of new technologies in health and healthcare is commonly referred to as ‘telemedicine’ or ‘e-health’. A comprehensive introduction to telemedicine is beyond the scope of this report. Box 5.4 provides a brief introduction and signposts for gaining more information on the development of telemedicine and telemedicine applications.

### Box 5.4: Telemedicine

The term ‘telemedicine’ has long been used to describe any medical activity undertaken over distance through the use of telecommunications, such as the early use of ship to shore radio for passing medical advice to sailors. With the growing use of ICTs, telemedicine, or e-health as it is often called, is becoming more widespread and more important. Telemedicine often involves the acquisition and provision of information by both health professionals and patients, by telephone, email or Internet. However, telemedicine is increasingly being used for medical activities such as the remote monitoring of diseases, rapid transfer of medical data or X-ray images and ‘virtual’ house visits whereby health professionals use telecommunications equipment such as videoconferencing to ‘visit’ patients in their home. In the US, for example, elderly patients with diabetes and heart problems are piloting the ‘Health Buddy’ device, which monitors their condition and allows health professionals to detect problems whilst preventing the need for frequent house visits. The small device plugs into the phone line and prompts users to answer questions targeted to their condition by pressing one of four large buttons. The responses are sent to a special website protected by a password from where a health professional can monitor conditions of hundreds of patients. Further information about other telemedicine applications and developments can be accessed through the following websites:

- [Telemedicine Information Service](www.tis.bl.uk)
- [European Health Telematics Observatory](www.ehto.org)

### 5.6 Summary

Information and Communication Technologies are becoming an increasingly important part of modern society. Technology is constantly updating and improving, and is creating new opportunities for communication, exchange of information, business transactions and entertainment. Handled properly these new and emerging technologies have the potential to impact positively on the way our society operates and in particular to play an important role in improving health and reducing inequalities. Handled poorly they will marginalise deprived communities, exacerbate inequalities and increase social exclusion.

Digital TV is a widely acceptable and accessible technology that may soon have a central place in almost every home in the country. Although people currently appear to be reluctant to use interactive features, improvements in quality and interactive services may encourage more people to use their televisions to access information, and professionals could take advantage of high levels of television viewing to provide timely public health information through this platform. Broadband is a technology
that is slowly being adopted in the UK; held back by high costs and inadequate geographical coverage. It offers great potential to all sectors of society including public health by enabling rapid data transfer. Importantly however, it will increase the entertainment appeal of the Internet and by removing slow download times it should encourage more people to use online services. In relation to public health, broadband not only enables much more efficient electronic working and communication, but also makes applications such as videoconferencing possible, opening up broader national and international networks. Broadband could prove particularly useful for reducing health inequalities among people who are currently unable to participate fully in society.

Future technologies, such as third generation (3G) mobile, should enable people to conduct online transactions rapidly whilst on the move, and although it is not possible to predict how these technologies will impact on public health, improved communications and ability to exchange information should hopefully be beneficial to both public health professionals and the general public. Technology has many potential uses in health, as can be seen by the number of telemedicine initiatives underway around the world, and the advent of new technology will no doubt change the way public health and healthcare is managed. However, initial access to new technologies will be uneven, and health organisations should always consider access levels, expected uptake and public opinion of any new technology amongst target audiences before developing initiatives based upon them.

References

8 NTL, wwwntl.co.uk, price for NTL subscribers £4.99 as of March 2002
9 OnDigital, www.ondigital.co.uk, price for OnDigital subscribers £5.00 on March 2002
Chapter 6

Creating Web Pages

6.1 Introduction

The design of any web site should reflect the needs of its expected users with access, usefulness and usability being key considerations from concept to launch. Equally as part of the development, the technical design that underpins the site’s functionality and the process for maintaining function and content are also of utmost importance. Most audiences are heterogeneous and large numbers of individuals can be prevented from accessing information or excluded from the health benefits of ICTs if disabilities\(^1\) are not considered throughout development. Ultimately, a website that does not appeal to its target audience or one that is not accessible, runs too slowly or is difficult to use will not sustain interest and will fail to achieve its objectives. A number of organisations and individuals have produced useful resources on designing accessible and user-friendly websites, some of which are provided in Table 6.1:\(^1\)

<table>
<thead>
<tr>
<th>Resource</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Wide Web Consortium</td>
<td><a href="http://www.w3.org/WAI">www.w3.org/WAI</a></td>
</tr>
<tr>
<td>NHS Health Promotion England</td>
<td><a href="http://www.hpe.org.uk/webtools.htm">www.hpe.org.uk/webtools.htm</a></td>
</tr>
<tr>
<td>Royal National Institute for the Blind</td>
<td><a href="http://www.rnib.org.uk/digital/hints.htm">www.rnib.org.uk/digital/hints.htm</a></td>
</tr>
<tr>
<td>Jakob Nielsen</td>
<td><a href="http://www.useit.com">www.useit.com</a></td>
</tr>
<tr>
<td>National Cancer Institute</td>
<td><a href="http://www.usability.gov">www.usability.gov</a></td>
</tr>
<tr>
<td>Usable Web</td>
<td><a href="http://usableweb.com">http://usableweb.com</a></td>
</tr>
</tbody>
</table>

In addition to design, there are a number of particularly important issues that need to be considered by web developers. Development and maintenance costs can vary greatly and careful choice needs to be made at the beginning of projects about whether maintenance will take place in house or will be contracted to an external supplier. Adequate security measures need to be taken to protect the website and other electronic communications from potential threats; an issue which is of particular importance to health organisations when dealing with confidential information. Furthermore, once a website has been developed, it needs to be promoted to its target audience and be continuously monitored to ensure it is meeting the needs of its users and is achieving its objectives.

The government and the NHS have developed guidelines for public sector websites that cover many issues including design and security. This chapter looks briefly at

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\(^1\) Web pages are regularly updated and changed. The addresses of these pages are correct at time of printing - if these pages no longer exist, visit the organisation’s home page and search for the document or contact the organisation and request a copy.
these guidelines before providing more general information for developing, maintaining, promoting and evaluating websites.

6.2 Guidelines for UK Government Websites

The government has developed guidelines for the development, management and use of public sector websites to ensure compliance with technical standards and consistency in structure and performance across departments\(^2,3\). The guidance provides ten key principles for web development that are outlined in Table 6.2. The full guidance explains why each principle is important, outlines the main issues involved, and provides practical advice for implementation. An illustrated online handbook will accompany the guidelines. These guidelines provide valuable information to developers who are creating public access websites, and include signposts for gaining further information about specific issues. The guidelines can currently be accessed at [www.e-envoy.gov.uk/webguidelines.htm](http://www.e-envoy.gov.uk/webguidelines.htm).

6.3 NHS Identity Guidelines

For NHS organisations wishing to develop a web presence, the Department of Health has developed NHS Identity Guidelines for websites\(^4\), combining both general government standards and standards specific to NHS organisations. The NHS Identity guidelines aim to ensure that NHS organisations develop websites with a design style that reflects the values and direction of the NHS and meets its communication objectives. The guidelines provide detailed information on accessibility and usability issues (see Section 6.5 for more information) to ensure that NHS websites are accessible to and can communicate with as many members of society as possible. They also provide guidelines on design, style, content and navigation issues to ensure the site is representative of the NHS and is recognisable as a NHS service. Under the Disability Discrimination Act\(^5\), NHS organisations are required to make ‘reasonable adjustments’ to ensure their websites are as accessible as possible\(^4\).

All web developers who are setting up or maintaining a web presence for an NHS organisation should read and follow the NHS Identity Guidelines for Websites. The Department of Health asks that NHS organisations that have already developed a website make efforts to bring the website into accordance with the guidelines over time. A checklist is provided as an appendix to the guidelines to ensure that NHS websites effectively represent the values and principles of the NHS. Box 6.1 provides selected examples of issues covered by the NHS identity guidelines.
<table>
<thead>
<tr>
<th>Table 6.2: Guidelines for UK Government Websites: ten key principles¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Engaging, accessible, usable</strong></td>
</tr>
<tr>
<td>“Government websites should be user focused. This means they are engaging; provide the information and services that users want; continually evolve to meet user demand; and achieve universal accessibility and usability”</td>
</tr>
<tr>
<td><strong>2. Working together</strong></td>
</tr>
<tr>
<td>“Government websites must work together to join up the government and, in delivering this, adhere to the mandatory e-Government Interoperability Framework (e-GIF)”</td>
</tr>
<tr>
<td><strong>3. Services for the citizen</strong></td>
</tr>
<tr>
<td>“Government organisations must be working to provide their services online”</td>
</tr>
<tr>
<td><strong>4. Effective content</strong></td>
</tr>
<tr>
<td>“Users should be able to have reasonable expectations about the quality, accuracy and uniformity of government content using, for example, the UK online brand”</td>
</tr>
<tr>
<td><strong>5. Building trust</strong></td>
</tr>
<tr>
<td>“Government websites must raise citizen confidence by abiding by the law and explaining their terms and conditions to users. They should also be secure from intrusion and address the issues raised by the draft Trust Charter for Electronic Service Delivery (e-Trust Charter) guidelines, which clearly set out the rights of the citizen with respect to the information held by government”</td>
</tr>
<tr>
<td><strong>6. Listening – two way communication</strong></td>
</tr>
<tr>
<td>“Users expect communication on the Web to be two-way. Government websites should provide opportunities for users to contact officials, express their views or make enquiries”</td>
</tr>
<tr>
<td><strong>7. More than just the Web – multiple access channels</strong></td>
</tr>
<tr>
<td>“Government websites should operate within a strategy that includes a full range of channels, such as iDTV² and mobile devices”</td>
</tr>
<tr>
<td><strong>8. Is it working?</strong></td>
</tr>
<tr>
<td>“Government websites should have systems for evaluating their success and determining if they are meeting the needs of users, making alterations where appropriate”</td>
</tr>
<tr>
<td><strong>9. Can your site be found?</strong></td>
</tr>
<tr>
<td>“Government websites must provide consistent metadata (data about data) about their documents, as outlined in the mandatory e-Government Metadata Framework (e-GMF). Managers should also promote the site and register it with search engines”</td>
</tr>
<tr>
<td><strong>10. A well managed service</strong></td>
</tr>
<tr>
<td>“Government websites should be well managed with adequate resourcing; clear strategy, aims, and target audiences; publishing and business procedures in place; and a strategy for future development including moves to dynamic databases and other digital media”</td>
</tr>
</tbody>
</table>

¹ The e-Government Interoperability Framework involves adopting internet and world wide web standards for all government systems. All public sector bodies are obliged to adhere to e-gif standards. More information is available on the GovTalk website under ‘ interoperability’, [www.govtalk.gov.uk](http://www.govtalk.gov.uk)

² Interactive Digital Television
Box 6.1: Examples of guidance provided through NHS Identity Guidelines for Websites

- All NHS organisations’ home pages should be linked directly to nhs.uk (www.nhs.uk) and to NHS Direct (www.nhsdirect.nhs.uk)
- NHS websites should not use frames unless absolutely necessary and then should always provide a ‘no frames’ version – access to this should be clearly displayed on the homepage
- Where possible, all NHS websites should use Arial/Helvetica family fonts. Times family fonts can be used occasionally, and Frutiger and Garamond fonts can be used for graphics.
- NHS websites should generally use a white background with black text and navigation areas should be white or NHS blue - any other colours to be used on NHS websites should be selected from the NHS web-safe colour palette provided in the guidelines
- All NHS websites should carry the NHS logo or an organisational logo that conforms to NHS identity guidelines – logos should generally be positioned at the top right of the page
- NHS websites should not allow any kind of advertising and should not directly link to commercial sites

www.doh.gov.uk/nhsidentity/websites.htm

The current version of the NHS Identity Guidelines is available on the Department of Health website at www.doh.gov.uk/nhsidentity/websites.htm. However, amongst other developments technological change means that the guidelines now require revision and are currently in the process of being updated. The new NHS identity guidelines for websites will contain a naming convention providing a standard addressing system for NHS websites. This should enable website users to more easily locate and remember NHS websites and should enable the NHS to maintain a more organised and comprehensive web presence.

6.4 General guidance on web development

Several organisations have developed basic guidance on developing websites (see Table 6.1) and many focus on usability issues. Health Promotion England’s ‘Handy Web Tools’ resource (www.hpe.org.uk/webtools.htm) for example provides information on writing and editing for the web, offers guidance on linking to other sites and managing search engines, and provides links to a wide range of other resources on developing websites.

Although this document is not intended to provide comprehensive advice on the best way to develop a website, the following briefly outlines some of the key issues to be considered when developing a website.
6.4.1 Content
For a website to be successful, the content (information it contains) must be relevant to the target audience. Most organisations and individuals planning to develop a website will already have a good idea of the type of content they want to include; although the best way to determine the content of a website is to consult with potential users. This process often ends in content considerably different from what was first imagined. Content should be regularly updated to ensure it is current and to encourage users to keep returning to the site.

6.4.2 Layout and design
The layout of a website needs careful consideration. Users should be able to find the information they are looking for quickly and easily and should not have to pass through too many other pages to get to the page they want.

Every website should have a homepage, which is the central page on a web site and the page that many site visitors will enter the site through. The homepage of a web site should ideally include:
- Website name
- Name and contact details of the organisation running the site
- Brief information about the site and its objectives
- Metadata (to enable the site to be found by search engines; see Box 6.2)
- A navigation menu to direct users to other parts of the website
- Links to other important websites (e.g. www.nhs.uk and www.nhsdirect.nhs.uk)

The content of a website is divided into individual web pages, ideally with each page covering a specific topic. The length of a web page depends on its intended audience. Pages aimed at children, for example, should be shorter than those aimed at professionals who are seeking detailed information. In general, web pages should contain no more than around 2,000 words. Web pages should be divided into clear and logical sections, such as ‘Publications’, ‘News’ and ‘Local Services’, and these sections should be accessible directly from the website’s homepage.
Box 6.2: Metadata

Metadata is often defined as being ‘data about data’, meaning it is information explaining the content, form and purpose of a resource. Metadata has long been used for cataloguing and enables information held in a collection to be found without requiring the user (human or machine) to read through all information in the collection to find it. In a shopping catalogue, for example, metadata may describe the type, brand, price, colour and size of each item. Metadata is used on the Web to describe the type and content of an online resource. Users (including search engines) use this metadata to find relevant online information quickly, whilst content providers can use metadata to manage and classify resources. Metadata can be included in the head of HTML pages and documents, and may include categories such as ‘title’, ‘creator’, ‘content’, ‘type’ and ‘date’. Metadata for the UK Online Annual Report 2001, for example, includes:

<table>
<thead>
<tr>
<th>Title:</th>
<th>UK Online Annual Report 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creator:</td>
<td>UK Government Cabinet Office, Office of the e-Envoy</td>
</tr>
<tr>
<td>Subject (keywords):</td>
<td>uk online; electronic commerce; e-commerce; electronic service delivery; internet; internet access; telecommunications; ict; trustuk; tscheme; e-envoy; e-minister; cabinet office; cisu; central internet strategy unit; government; uk government; e-science; e-procurement; e-tendering; e-government; itec; m-commerce; knowledge network</td>
</tr>
<tr>
<td>Type:</td>
<td>Document</td>
</tr>
<tr>
<td>Date created:</td>
<td>2001-11-29</td>
</tr>
</tbody>
</table>

Metadata is most effective if it is structured and consistent – an efficient metadata system can help users retrieve the most appropriate information from a search engine. Several metadata standards exist including the e-Government Metadata Standard (e-GMS), developed to enable all online government information to be retrieved and managed effectively. Further information on metadata and the government’s framework and metadata standard is available on the GovTalk website’s Interoperability section: [www.govtalk.gov.uk](http://www.govtalk.gov.uk)

6.4.3 Writing for web pages

Due to the huge amount of information available on the Internet, people tend to read web content differently than they would read paper-based information, which means information providers need to write for the Web accordingly. Box 6.3 gives suggested guidelines for writing for web pages.

Box 6.3: Writing for web pages

People do not tend to read web pages from start to finish, but are more likely to scan the text to see if anything interests them. Some suggested guidelines for writing for web pages include:

- Make sure the language is appropriate to the target audience
- Break text into short paragraphs
- Use lots of headings and subheadings
- Use bullet points and numbered lists
- Highlight key words in the text
- Do not use ‘jargon’ or specialist terminology unless writing for a specialist target audience
- Use a familiar tone rather than sounding too formal
- Ensure the text sounds credible and authoritative
- Use illustrations as appropriate
- Include hypertext links allowing the reader to explore issues further
- Remove any unnecessary text
- Do not exaggerate or boast
- Ensure all written information is legal, accurate, non-discriminatory, non-offensive and well-referenced
6.4.4 Design
The design of a website is also important – web pages should be relatively attractive to the target audience, not too busy and should be easy to use (i.e. buttons and links should be easily identified and it should be obvious how to use them). Many Internet users will not be able to view content developed in web-oriented multi-media packages such as Flash or programming languages like Java, and if these are to be used, a text version of the content also needs to be provided\(^\text{10}\). Individual web pages should be relatively consistent in their design so users recognise that each page is part of the same website - designing a web page template can ensure all pages look similar and can also facilitate creation of the site\(^\text{6}\). It is useful if every page on the website tells the user exactly what the page is about, the date the page was last updated, and the author or source of the information on the page. Also, all pages should contain a link back to the home page to prevent users from getting lost.

6.4.5 Large documents
The file size of large documents should always be clearly indicated. Large documents intended for printing can be provided effectively as PDF (portable document format) files. To view PDF files on the Web, users will require Adobe Acrobat Reader\(^\text{TM}\) - when a PDF file is provided on a website a link to the Adobe website (www.adobe.com) should be provided to enable users to download the programme. Adobe Acrobat Reader 5.0 incorporates several accessibility features to enable people with disabilities to use PDF files, such as the ability to alter text size and to navigate a document by using the keyboard rather than the mouse\(^\text{11}\).

6.4.6 Interactivity
Rather than just supplying information, the Internet provides numerous opportunities for interaction and where possible websites should allow users to actually become an interactive part of the web experience. Users are likely to spend more time using the website and to return to use it again if they find it stimulating and interesting. Possible methods of providing interactivity include surveys, self-assessments, discussions and message boards. Such interactive features can have the added advantage of allowing website owners to find out about their audience\(^\text{7}\).

6.5 Usability
The technical equipment being used by individuals to access the Internet will vary widely, as will the technical ability of users. Some people may have physical disabilities that affect their ability to use technical equipment, such as arthritis or poor eyesight. This should not mean that they are prevented from using the Internet to access information. By taking usability issues into consideration web designers can easily develop sites to be accessible to a broader range of users. Already in some countries there is also a legal aspect to the creation of accessible websites. In Australia, a blind Internet user was awarded AUS20,000 from the Sydney Olympics Games Organising Committee when the Australian Human Rights and Equal Opportunities Commission ruled that the Olympic website was not designed to be accessible to him\(^\text{12}\).

Many organisations have developed guidelines on web development, a number of which are listed Table 6.1, Section 6.1. The World Wide Web Consortium’s (W3C) Web Accessibility Initiative provides possibly the most detailed information about
accessibility issues including guidelines and checklists for web developers to use to ensure their site is accessible. Resources are free and are available at www.w3.org/WAI. Many organisations that have developed accessibility guidelines are likely to have used the W3Cs Web Accessibility Initiative as the basis for their own guidelines. Table 6.3 summarises some of the key usability issues that web developers should address.

6.5.1 Usability Testing
Before a website is launched it should be thoroughly tested to ensure it is usable. Usability testing involves the recruitment of a number of individuals from the target audience to ‘test’ the site throughout the development process – the earlier usability testing starts the better. Testers should be set a number of tasks to undertake using the website according to what the site is to be used for. For example, testers could be asked to find out information about a certain health issue or to find the telephone number of a local service provider. Any problems users encounter when trying to fulfil these tasks can then be dealt with, and users can make suggestions for improving the site. Once the site is up and running, continuous maintenance is required to ensure that all links are in working order and, of course, that all information contained on the site is up to date and correct. Testing can also help identify if members of the target audience find the website interesting and appealing.

The Centre for Applied Technology (CAST) has developed ‘Bobby’, an online tool for testing the accessibility of websites, which is outlined in Box 6.4.

<table>
<thead>
<tr>
<th>Box 6.4: Bobby - website accessibility testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Centre for Applied Special Technology (CAST) has developed a website accessibility tool, called Bobby (<a href="http://www.cast.org/Bobby">www.cast.org/Bobby</a>), which assesses web pages for accessibility factors in accordance with web accessibility guidelines from the World Wide Web Consortium’s Web Accessibility Initiative. By entering the web address of any web page, Bobby will identify areas that are likely cause problems to some people and will inform web developers of how to amend them. Web pages that reach the required standards of accessibility are awarded ‘Bobby Approved’ status.</td>
</tr>
</tbody>
</table>
Table 6.3: Designing Usable Websites\textsuperscript{4,6,10,13,14,15,16}

**Technical issues**
- Design websites to work using different browsers and screen resolutions – ensure all sites are tested on a variety of different systems before going live.
- If web pages are designed to use programmes such as Flash and Javascript, always provide plain HTML versions of these pages for people whose systems cannot support such programmes and offer users the choice of which version they want to access.
- If designing a website with frames, always provide a ‘no frames’ version.
- Avoid large file sizes that will increase download times. Recommended maximum page sizes include:
  - 40k for a home page
  - 30k for a standard information page
  - 30k for single images
- Use tables with caution – some screen readers cannot read them and will not present them as intended.

**Colour Scheme**
- Use a single colour background, avoid patterns and images as backgrounds.
- Use a text colour that clearly stands apart from the background.
- Don’t use combinations of colours like red and green or blue and yellow that people with certain types of colour blindness will not be able to distinguish between.
- Design all parts of the site using the 256 colour web palette.

**Text**
- Use at least a size 12 font size. Text does not have to be too large as text size can be adjusted by the user’s browser.
- Ensure the text colour stands out from the background colour.
- Don’t use large blocks of italics.
- Avoid writing whole sentences in capital letters.
- Do not underline text that is not a hyperlink – this can be confusing and may be difficult to read.
- Avoid using graphics instead of text – text size can be altered by users, but graphics are fixed.
- Text that moves, flashes or automatically updates can be problematic for people with poor sight – avoid these if possible or provide ways for users to slow down or stop text movement.

**Images**
- Keep the image size small to reduce download time.
- If using images of people, ensure these are representative of the target audience.
- Ensure a concise, informative text equivalent is provided for all non-text object, e.g. by using the ALT tag.

**Navigation**
- A website should be easy to navigate – users should not get lost, be unable to find what they are looking for or have difficulty getting back to a page they have already visited.
- Provide a text-based site map showing the layout of the site and providing links to all areas of the site.
- All navigation buttons and links should be large and easy to use – some users may have difficulties double clicking and scrolling.
- Images should not be used as buttons unless they are clearly marked – roll-over buttons that change to text when the mouse is passed over them may not be found by inexperienced users.
- Ensure all links are descriptive so users know exactly where they will take them, e.g. the link ‘online application form’ would take the user to an online application form. Some screen readers may list links out of context, so links such as ‘click here’ should be avoided.
- Use the same navigation buttons throughout the site and keep them in similar locations on each page. For example, the same ‘homepage’ button could be located in the top left hand corner of every page.
- Make sure users don’t have to scroll through large pages to find navigational buttons.
6.6 Other Issues Surrounding Web Development

6.6.1 Cost
The costs involved in developing and maintaining a website can vary enormously depending upon the size of the website, what features it contains, and methods chosen to develop it. Some organisations may choose to contract out to an external company, who will develop and maintain the website for them. Others may choose to employ an in house web developer to create and maintain the site. A short survey conducted during the development of this document found that the price paid by PCTs to set up a website ranged from zero to £50,000, whilst the annual cost of maintaining it ranged from zero to £20,000. For both set up and maintenance, costs of ‘zero’ are probably the result of good will efforts by in house enthusiasts and consequently do not properly account for web developer’s time.

Often, the cost of development is related to how interactive the website functions will be. For example, a site with a series of text (HTML) pages that are not likely to change once developed would cost less than a site where the owner required online access to be able to update the contents on a regular basis. When considering what functionality is available for what cost, it is essential to consult a variety of website developers before proceeding.

6.6.2 Development and Maintenance: in house or out?
Developing and maintaining a website internally or contracting to an external supplier both have their advantages. Maintaining control of the website in house (i.e. through employing dedicated staff) can prove more convenient as the web developer is always available to update the website, solve any problems and answer user queries and in some circumstances (but not all) it may be cheaper. Using an external web developer, however, gives access to specialist programming skills and software that may not be affordable internally, can allow quicker site production by a skilled team, and can provide PCTs with valuable experience that would not otherwise be available. However, generally if sites are developed externally they should be designed so that they can be updated in house by someone without specialist web skills. This allows organisations to change content without incurring on-going costs from the supplier. Importantly, regardless of in house or external development it is essential that site back-up procedures are defined, agreed as adequate and adhered to. Of equal importance are security issues, particularly if the site is to be used for transferring patient information (see Section 6.6.5).

6.6.3 Promotion
The effective promotion of a website is very important - if nobody knows a website exists, nobody will use it. A website can be promoted online through, for example, search engines, links, online banner adverts and discussion groups and can be promoted in the ‘real’ world through press releases, distribution of leaflets, strategic positioning of posters, stationery and brochures and possibly advertising in newspapers and journals or on television and radio2,7 (several radio stations now broadcast online and with the right technology people are able to listen to the radio through their computer and use the Internet at the same time). Many topic-based magazines also now contain a section that might run to several pages, which lists new relevant websites. A website aiming to provide local public health information to local populations may find traditional, off-line methods of promotion most effective.
The main target audience will be located within a ‘manageable’ geographical area and may be reached through the distribution of leaflets, strategic positioning of posters, or advertising through local radio or newspapers. A site aimed at public health professionals or at a particular population group may find online promotion methods effective, possibly through announcing the existence of the website on relevant mailing lists or linking to appropriate websites. All sites should be registered with search engines and directories so that people can locate the site if they are unsure of the address and so that people searching for information held on the site are alerted to its existence.

Making a website visible to search engines
A website will only be found by a search engine if the search engine knows it exists, and it is the responsibility of the web developer to tell search engines where their site is and what information it contains. Every search engine will have its own submission process which is accessed via the search engine site through links such as ‘Add URL’, ‘Suggest a Site’ or ‘Add Site’ (for addresses to some major search engines see Chapter 3, Table 3.10). Information required to submit a site will typically include the site address, a title, a description, keywords and contact information. Different search engines will have different criteria for inclusion and web developers should ensure their site fulfils each search engine’s criteria before submitting. Once a site has been submitted to a search engine, it will not immediately be picked up by that search engine but may take several weeks before being recognised due to the volume of websites available. Submitting a website to a search engine several times can be counterproductive as search engines may exclude sites that are submitted more than once. It is often possible to pay a search engine to be indexed almost immediately.

Software for submitting sites to search engines
Although the submission process is simple, it can also be very time consuming. A site will need submitting to many different search engines, which may have different submission rules and may require different information or the same information submitted in a different format. Some organisations may consider the use of automated search engine submission software to save the time required for manual submission. These packages can submit websites to many search engines automatically with information only needing to be typed in once and the software submitting the required information to individual search engines.

6.6.4 Naming a website
The choice of name given to a website is very important and can play a large part in ensuring people visit and return to a website. A website with a complicated name or one that does not relate to the website’s content is unlikely to be remembered by users. If users have to locate the site through a search engine using key words there is a chance they will find a different site which they may then use instead. Local websites should include a geographical reference if appropriate. The Department of Health is developing a naming convention for NHS-branded websites which, when available, will provide a standard format for selecting website names for NHS organisations. Until this convention is implemented, the name chosen for a website should:

- be available (e.g. not already registered to another organisation)
- be relevant to the subject of the website
be easy to remember
be easy to spell
be as short as possible
not include punctuation

6.6.5 Security
The security of electronic information and online activities is of utmost importance, and all forms of electronic communications including websites should be designed to be as secure as possible. Security issues include preventing hackers from entering information systems and causing disruption or accessing confidential information, protecting information systems from unexpected problems such as power failures, and protecting email systems and websites from viruses. For example, there are thought to be around 1,200 new viruses appearing every month which can spread from computer to computer by email17. Viruses attack information systems in many different ways, for example by overloading a website with requests for information to prevent genuine users from accessing the site, or by corrupting data held on a computer by changing the positioning of numbers. The government provides a Security Framework18 for the electronic delivery of government services, available on Office of the e-Envoy website: www.e-envoy.gov.uk.

Due to the sensitive nature of much of the information being handled by the NHS, security is of particular importance. It is essential that electronic information on patients is kept private, that data standards are maintained, that websites and email correspondence are be protected from destructive viruses, and that both local and national information systems are capable of surviving disaster. To ensure that the NHS manages the risks associated with its use of information effectively, the NHS Information Authority is developing a Security website which will provide important IT security advice and guidance for NHS organisations, including cryptography, virus briefings, third party connections and NHSnet security policies. This includes an Information Security Resource Pack entitled ‘Ensuring Security and Confidentiality in NHS organisations’ which aims to assist the NHS with:

- Implementation of the Caldicott Recommendations (patient information)
- The 1998 Data Protection Act and other relevant legislation
- Information security risk management
- Business continuity planning
- Incident response

The NHS Information Authority Security website is available via NHSnet only at www.nhsia.nhs.uk/security/pages/default.asp.

Although aimed at businesses and not health-related organisations, UK Online for Business produces a useful guide to e-security19 which provides information on security websites and electronic activities, including issues such as viruses, privacy and confidentiality, power failure and online fraud. The guide is available on the UK Online for Business website: www.ukonlineforbusiness.gov.uk

6.6.6 Data Standards
Consistency of information and data standards are recognised as being essential in the development of electronic health20. As such, the Data Standards Programme at the NHS Information Authority works to develop and promote data standards across the
NHS, the Department of Health and relevant groups to enable consistency and accuracy in data collection and exchange. The Programme provides access to nationally agreed data standards for the NHS through the NHS Data Dictionary and Manual, and to information on the exchange of data between health care providers and commissioners through the NHS Commissioning Data Set (CDS) Manual. Both resources are available on the NHS Information Authority Data Standards Programme website at www.nhsia.nhs.uk/datastandards.

6.6.7 Monitoring and evaluation

Once a website is up and running it should be evaluated regularly to ensure it is being used and is achieving its objectives. Use of a website can be ascertained by looking at the number of ‘hits’ and, more importantly, how long users stay on a site and whether they return. A range of free software used to be available for monitoring site traffic. However, while some basic free packages are still available, most quality monitoring packages now have to be paid for; although such services are usually reasonably priced. Table 6.4 provides examples of monitoring packages available. However, this list is not intended as a recommendation of any packages.

<table>
<thead>
<tr>
<th>Product</th>
<th>Web Address</th>
</tr>
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<tbody>
<tr>
<td>TheCounter.com</td>
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<tr>
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<td><a href="http://www.webtrends.com">www.webtrends.com</a></td>
</tr>
<tr>
<td>Net Tracker</td>
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<tr>
<td>Site Stats</td>
<td><a href="http://www.sitestats.com">www.sitestats.com</a></td>
</tr>
<tr>
<td>123LogAnalyzer</td>
<td><a href="http://www.123log">www.123log</a> analyzer.com</td>
</tr>
<tr>
<td>Free Stats</td>
<td><a href="http://www.freestats.com">www.freestats.com</a></td>
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</tbody>
</table>

Some Internet service providers include basic software packages free to sites that they host, and those organisations that have their own server should be able to arrange for a programmer to set up a system for accessing and monitoring log files (which contain details of visits to the site). Monitoring software should enable web developers to identify which areas of the web site are most popular (by seeing which areas are most used), what subjects most users are interested in (by looking at what search terms are most frequently entered into site search facilities), and which areas are either inaccessible or not of interest to users.

In addition to looking at hits, evaluation should include consultation with users, for example through the use of online questionnaires or feedback forms. A questionnaire can be used to ask for opinions of users about how easy the site is to use, how useful they think the information on the site is and if they have any recommendations for improving the site. Short surveys can be used to gain a general opinion on an issue by asking users to supply a very brief ‘yes’ or ‘no’ to a question. However, sites should not force users to answer questionnaires by not allowing them to use part of the site without first completing the questionnaire. User feedback allows users to comment on parts of the site that they find most useful or parts that they think should be altered. These facilities can also be useful in finding out parts of the site that do not work such as broken links (a link that fails to take the user to its intended destination).

Some organisations have developed tools for ensuring that online health information is provided to a certain standard and web developers can take advantage of these tools.

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1 a server is a powerful computer that holds the information and files for the websites it serves
to check that their site is providing information in a clear manner that will encourage users to have confidence in it. A good example of such a resource is that provided by the Health on the Net Foundation (HON), known as the HON Code. The HON Code is one of the most widely known and longest standing codes of conduct for online health information providers, which aims to help ensure readers know the source and the aims of online health information and to ensure web developers maintain basic standards in presenting online health information24 (www.hon.ch).

6.6.8 Linking to other websites
Most websites contain links to other sites so users can find more information about a subject or access relevant services. The Department of Health asks that all NHS websites provide links to NHS Direct and nhs.uk. Figure 3.2 in Chapter 3 shows a number of important sites that PCT websites could provide links to. Generally, NHS organisations should not link their websites to commercial sites as these may be biased and the NHS may be seen as favouring one commercial organisation over another4. However, PCT websites can link to a range of sites with relevant website content such as those provided by other NHS services, government departments, local authorities, academic departments or voluntary organisations. As a rule, external sites should be evaluated for quality before being linked to.

There has been much concern about the quality of online health information and the dangers that could arise if people access and act upon inaccurate information, and the World Health Organisation is currently campaigning towards the creation of a `.health’ domain name to help consumers identify legitimate health websites25. The growth in the amount of online health information has brought with it numerous initiatives to help people ascertain the quality of online health information. These include ‘seals of approval’ for websites that meet certain criteria, and checklists against which users can assess the content of sites for reliability. However, online evaluation tools should be examined themselves before being used as research has found that many of these assessment tools are incomplete or are themselves of undetermined quality26,27. However, there are some useful evaluation tools available that can provide valuable assistance in recognising and dismissing poor quality online information. One example of an online evaluation tool for assessing the quality of online information about treatment resources is that provided by Discern, outlined in Box 6.5.

**Box 6.5: Discern**

<table>
<thead>
<tr>
<th>Discern, a widely used criteria for assessing the quality of printed health information, now provides an ‘experimental’ online resource for assessing the quality of online health information on treatment choices. The resource enables users to rate online health information through the use of a questionnaire containing 15 questions on the reliability of the publication and specifically about information on treatment choices. The resource is aimed at health consumers (i.e. patients) but can be used by anyone to assess the reliability of an online publication as a source of information on treatment choice28. Development of the online Discern resource is funded by the NHS Executive Research and Development Project.</th>
</tr>
</thead>
</table>

www.discern.org.uk
6.7 Summary

There are many issues surrounding website development and maintenance that need to be taken into account when planning a website and which can make a substantial difference to the success of an online initiative. Websites need to be designed around their intended target audience and need to be appropriately designed to fulfil their intended function. Importantly they also need to take into account accessibility and usability issues. A range of guidelines for developing accessible content is now freely available, as are a number of tools for assessing accessibility.

In addition to accessibility and usability, when planning a web presence the process of development (including audience consultation) and issues of long term maintenance should be addressed from the beginning. Along side these issues organisations must consider: how security is going to be guaranteed; how the site is going to be promoted; and how the finished site will be monitored and evaluated to ensure it is being used and is achieving its objectives.

Primary Care Trusts are responsible for the health of their local populations and will be expected to utilise new technologies both to communicate with local populations and to exchange knowledge and skills with other professionals. In order to deliver the best possible service it is essential that they use these new technologies effectively and securely. This chapter is far from comprehensive and is not intended to replicate or review the thousands of reference texts available on web site development. However, the issues touched on are some of the most important for those developing or redeveloping a website for health purposes and more detailed information can and should be sought before any online initiatives are implemented.

References

26 Gagliardi A and Jadad AR (2002). Examination of instruments used to rate quality of health information on the Internet: chronicle of a voyage with an unclear destination. BMJ, 324: 7337, 569
28 Discern Online, About This Site, www.discern.org.uk, accessed 18th March 2002
Appendix 1

A short history of the Internet

Although the Internet as a mass public resource is a relatively new phenomenon, its origins actually date back to the Cold War. On 4th October 1957 Russia launched Sputnik, the first satellite to orbit the earth, beating the US into space and throwing the US government into panic. In response, the Advanced Research Projects Agency (ARPA) was created to increase the technological ability of the US. Originally concerned with strategic missile research, ARPA research quickly evolved to include computer and communication technologies and a decade later ARPAnet was created. ARPAnet was a network linking together two (and later four) mainframe computers (known as ‘nodes’), one based in the University of California Los Angeles and the other at Stanford Research Institute. Using keyboard and monitor ensembles connected to these nodes, researchers could send and receive messages between the two sites.

It is often suggested that ARPAnet was created to provide the US government with a communications network capable of surviving a nuclear attack. A communications system reliant on one single computer would be shut down if the computer was destroyed in a nuclear attack, whereas with a network, if a number of nodes were destroyed communications could simply be diverted through undamaged nodes. However, although the Internet’s fundamental technology of packet switching (see Box 1) may have been developed with this aim in mind, ARPAnet was actually created to enable the very expensive yet incompatible mainframe computers used at the time to communicate, creating a shared resource for ARPA-funded researchers.

<table>
<thead>
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<th>Box 1: Packet switching</th>
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<td>When a message is sent via the Internet from one computer to another, it is not sent as a whole message but is broken down into small ‘packets’, each 1500 characters long. Each packet is placed in an electronic ‘envelope’, labelled with the ‘address’ of the computer it is being sent from, the ‘address’ of the computer it is being sent to, details of it’s position in the package sequence and information for detecting errors. These envelopes are then passed from the sending to the receiving computer via other computers in the network until they reach their destination. The packets do not necessarily travel together, but are sent down the first available channel moving in the right direction. For example, a message being sent from a computer in the UK to a computer in the US may be broken into several packets, some of which may travel eastwards through Asia, and some westwards across the Atlantic. Distance is no object, as all packages travel at the speed of light. Upon arrival the receiving computer reassembles the packets and puts them in the correct order – if any packets are missing a request will automatically be sent back to the computer of origin for retransmission. When all packets have been received, the final message appears on the recipient’s computer. The whole process can be completed in a matter of seconds.</td>
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</table>

During the 1970s, many research agencies and universities joined ARPAnet, and in 1973 the network crossed the Atlantic to the UK. All ARPAnet communications to this point had taken place via huge mainframe computers, meaning only those with access to these computers were able to connect to the network. However, the 1970s also brought the development of the first personal computers (PCs), giving computer buffs without access
to ARPAnet the opportunity to create their own programmes and develop their own networks\textsuperscript{1}. It was during this decade that what turned out to be the Internet’s most popular application, electronic mail (e-mail), was developed, as were early newsgroups and File Transfer Protocol, an essential piece of the Internet allowing the secure transfer of files between computers\textsuperscript{2}.

In the early 1980s, TCP/IP (Transmission Control Protocol/Internet Protocol) was developed, controlling the transmission of ‘packets’ between computers (TCP) and the way separate computers are addressed (IP). This allowed any number of separate networks to link together into one huge network accessible to all. From 1984 to 1986 the number of host computers (nodes) on what was now being called the Internet grew from just 1000 to more than 60,000, and the network spread across the globe\textsuperscript{2}. However, the Internet really took off in 1991, when the World Wide Web and the first Web browser, accompanied by the new HTML computer language (masterminded by an Englishman working at the European Centre for Nuclear Research) went public. Previously, the Internet was only really accessible to those who understood computers and computer language – the WWW and Web browsers opened up the Internet to anyone with the right equipment to access it.

It was also in 1991 when a policy preventing use of the Internet for profit was removed – opening the Internet up for commerce. In 1993, a student from the US created a Web browser named Mosaic. Simple to use and freely available, Mosaic’s popularity helped to increase Web traffic by 2500 percent in the 12 months to June 1994. Businesses flocked to get online, rapidly followed by the general public. In December 1995, there were estimated to be around 26 million people in the world using the Internet. In November 2000 this figure had boomed to 407.1 million Internet users\textsuperscript{4}. The number of Internet users continues to rise on a daily basis, and the Internet has been hailed the fastest growing communications network ever\textsuperscript{1}.

References

\textsuperscript{1} Naughton, J (2000), A Brief History of the Future: The Origins of the Internet, Phoenix: London
\textsuperscript{3} Hamman R, History of the Internet, WWW, IRC and MUDs, \url{http://www.socio.demon.co.uk/history.html}, Accessed 5\textsuperscript{th} July 2001
\textsuperscript{4} NUA Internet Surveys, How Many Online? \url{http://www.nua.ie/surveys/how_many_online/world.html}, Accessed 11\textsuperscript{th} April 2001
# Appendix 2

## Useful Websites

### GOVERNMENT
- **Audit Commission** [www.audit-commission.gov.uk](http://www.audit-commission.gov.uk)
- **Cabinet Office UK** [www.cabinet-office.gov.uk](http://www.cabinet-office.gov.uk)
- **Department for Culture, Media and Sport** [www.culture.gov.uk](http://www.culture.gov.uk)
- **Department for Education and Skills** [www.dfes.gov.uk](http://www.dfes.gov.uk)
- **Department for Environment, Food & Rural Affairs** [www.defra.gov.uk](http://www.defra.gov.uk)
- **Department for International Development** [www.dfid.gov.uk](http://www.dfid.gov.uk)
- **Department of Health** [www.doh.gov.uk](http://www.doh.gov.uk)
- **Department of Trade and Industry** [www.dti.gov.uk](http://www.dti.gov.uk)
- **Department of Transport, Local Government and the Regions** [www.dtlr.gov.uk](http://www.dtlr.gov.uk)
- **Department for Work and Pensions** [www.dwp.gov.uk](http://www.dwp.gov.uk)
- **Government Gateway** [www.gateway.gov.uk](http://www.gateway.gov.uk)
- **Home Office** [www.homeoffice.gov.uk](http://www.homeoffice.gov.uk)
- **Info4Local** [www.info4local.gov.uk](http://www.info4local.gov.uk)
- **Learn direct** [www.learndirect.co.uk](http://www.learndirect.co.uk)
- **National Grid for Learning** [www.ngfl.gov.uk](http://www.ngfl.gov.uk)
- **Office for National Statistics** [www.statistics.gov.uk](http://www.statistics.gov.uk)
- **Office of Telecommunications** [www.oftel.gov.uk](http://www.oftel.gov.uk)
- **Office of the e-Envoy** [www.e-envoy.gov.uk](http://www.e-envoy.gov.uk)
- **Open.gov.uk web site** [www.open.gov.uk](http://www.open.gov.uk)
- **Parliament** [www.parliament.uk](http://www.parliament.uk)
- **Social Exclusion Unit** [www.cabinet-office.gov.uk/seu](http://www.cabinet-office.gov.uk/seu)
- **Stationary Office** [www.official-documents.co.uk](http://www.official-documents.co.uk)
- **The National Assembly for Wales** [www.wales.gov.uk](http://www.wales.gov.uk)
- **UK National Audit Office** [www.nao.gov.uk](http://www.nao.gov.uk)
- **UK Online** [www.ukonline.gov.uk](http://www.ukonline.gov.uk)
- **10 Downing Street** [www.number-10.gov.uk](http://www.number-10.gov.uk)

### NHS and NATIONAL HEALTH SITES
- **Association of Public Health Observatories** [www.pho.org.uk](http://www.pho.org.uk)
- **Commission for Health Improvement** [www.chi.nhs.uk](http://www.chi.nhs.uk)
- **Health Action Zones** [www.haznet.org.uk](http://www.haznet.org.uk)
- **Health Development Agency** [www.hda-online.org.uk](http://www.hda-online.org.uk)
- **Health Promotion England** [www.hpe.org.uk](http://www.hpe.org.uk)
- **Health Promotion Wales** [www.hpw.wales.gov.uk](http://www.hpw.wales.gov.uk)
- **Information for Health** [www.nhsia.nhs.uk/def/pages/info4health/contents](http://www.nhsia.nhs.uk/def/pages/info4health/contents)
- **nhs.uk** [www.nhs.uk](http://www.nhs.uk)
- **National Institute for Clinical Excellence (NICE)** [www.nice.org.uk](http://www.nice.org.uk)
- **National electronic Library for Health** [www.nelh.nhs.uk](http://www.nelh.nhs.uk)
- **NHS Alliance** [www.nhsalliance.org](http://www.nhsalliance.org)
- **NHS A to Z (Help for Health Trust)** [www.nhsatoz.org](http://www.nhsatoz.org)
- **NHS Centre for Health Care Development** [www.chcd.org](http://www.chcd.org)
- **NHS Centre for Reviews and Dissemination** [www.york.ac.uk/inst/crd](http://www.york.ac.uk/inst/crd)
- **NHS Direct** [www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk)
- **NHS Direct Wales** [www.nhsdirect.wales.nhs.uk](http://www.nhsdirect.wales.nhs.uk)
- **NHS Information Authority** [www.nhsia.nhs.uk](http://www.nhsia.nhs.uk)
- **NHS Information Policy Unit** [www.doh.gov.uk/ipu](http://www.doh.gov.uk/ipu)
- **NHS Modernisation Agency** [www.modernhhs.nhs.uk](http://www.modernhhs.nhs.uk)
- **NHS Wales** [www.wales.nhs.uk](http://www.wales.nhs.uk)
- **NHS University** [www.doh.gov.uk/nhsuniversity](http://www.doh.gov.uk/nhsuniversity)
- **Our Healthier Nation** [www.ohn.gov.uk](http://www.ohn.gov.uk)
- **Public Health Laboratory Service** [www.phls.co.uk](http://www.phls.co.uk)
- **Shifting the Balance of Power** [www.doh.gov.uk/shiftingthebalance](http://www.doh.gov.uk/shiftingthebalance)
- **The New NHS** [www.doh.gov.uk/nhssund.htm](http://www.doh.gov.uk/nhssund.htm)
- **The NHS Plan** [www.doh.gov.uk/nhsplan](http://www.doh.gov.uk/nhsplan)
- **Wired for Health** [www.wiredforhealth.gov.uk](http://www.wiredforhealth.gov.uk)
KEY HEALTH ASSOCIATIONS
Association of Public Health Observatories  www.pho.org.uk
British Medical Association  www.bma.org.uk
Faculty of Public Health Medicine  www.fphm.org.uk
General Medical Council  www.gmc-uk.org
Royal College of General Practitioners  www.rcgp.org.uk
Royal College of Nursing  www.rcn.org.uk
Royal College of Physicians  www.rcplondon.ac.uk
Royal Institute of Public Health  www.riph.org.uk
UK Public Health Association  http://web.ukonline.co.uk/pht

HEALTH TOPICS

ACCIDENTS
Accidents and Accidental Injury Task Force  www.ohn.gov.uk/ohn/priorities/accidents.htm
Child Accident Prevention Trust  www.capt.org.uk
Health and Safety Executive  www.hse.gov.uk
Health and Safety (DTLR; includes road and fire safety)  www.safety.dtlr.gov.uk
Home Safety Network (DTI)  www.dti.gov.uk/homesafetynetwork
Royal Society for the Prevention of Accidents  www.rospa.co.uk

ALCOHOL
ACAPS Alcohol Counselling and Prevention Services.  www.acaps.co.uk
Alcohol Concern  www.alcoholconcern.org.uk
Alcohol Education and Research Council  www.aerc.org.uk
Alcoholics Anonymous  www.alcoholics-anonymous.org.uk
Alcohol Problems Advisory Service: APAS  www.apas.org.uk
Institute of Alcohol Studies  www.ias.org.uk
The Portman Group  www.portmangroup.org.uk
The Society for the Study of Addiction  www.addiction-ssa.org

CANCER
CancerBACUP  www.cancerbacup.org.uk
Cancer Research UK  www.cancerresearchuk.org
Department of Health: Cancer  www.doh.gov.uk/cancer
Macmillan Cancer Relief  www.macmillan.org.uk
Marie Curie Research Institute  www.mariecurie.org.uk
National Electronic Library for Cancers  www.nelc.org.uk
National Service Framework: Cancer  www.doh.gov.uk/nsf/cancer
UK Association of Cancer Registries  www.thames-cancer-reg.org.uk/ukacr

CHILDREN
Childline  www.childline.org.uk
Institute of Child Health  www.gosh.nhs.uk/ich
National Children's Bureau  www.ncb.org.uk
National Family and Parenting Institute  www.nfpi.org
NeLH Child Health Virtual Branch Library  (entry via)  www.nell.nhs.uk
Save the Children  www.savethechildren.org.uk

COMMUNICABLE DISEASES
Immunisation (Health Promotion England & DoH)  www.immunisation.org.uk
National electronic Library for Communicable Diseases  www.neled.co.uk
Public Health Laboratory Services  www.phls.co.uk
TB Alert  www.tbalert.org
The Meningitis Trust  www.meningitis-trust.org.uk
WHO Infectious Diseases  www.who.int/health-topics/idindex.htm
**CORONARY HEART DISEASE & STROKE**

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**CRIMINAL JUSTICE**

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**DENTISTRY**

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**DIABETES**

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<tr>
<td>Insulin Pumpers UK</td>
<td><a href="http://www.insulin-pumpers.org.uk">www.insulin-pumpers.org.uk</a></td>
</tr>
</tbody>
</table>

**DISABILITIES**

<table>
<thead>
<tr>
<th>AbilityNet</th>
<th><a href="http://www.abilitynet.org.uk">www.abilitynet.org.uk</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>DeafBlind</td>
<td><a href="http://www.deafblinduk.org.uk">www.deafblinduk.org.uk</a></td>
</tr>
<tr>
<td>NeLH: Learning Disabilities</td>
<td><a href="http://www.nelh.nhs.uk/nelld">www.nelh.nhs.uk/nelld</a></td>
</tr>
<tr>
<td>Royal National Institute for the Deaf</td>
<td><a href="http://www.rnid.org.uk">www.rnid.org.uk</a></td>
</tr>
<tr>
<td>Royal National Institute for the Blind</td>
<td><a href="http://www.rnib.org.uk">www.rnib.org.uk</a></td>
</tr>
<tr>
<td>The Disability Unit</td>
<td><a href="http://www.disability.gov.uk">www.disability.gov.uk</a></td>
</tr>
<tr>
<td>YoureAble.com</td>
<td><a href="http://www.yourable.com">www.yourable.com</a></td>
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**DRUGS**

<table>
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<tr>
<th>DrugScope</th>
<th><a href="http://www.drugscope.org.uk">www.drugscope.org.uk</a></th>
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<tr>
<td>HIT</td>
<td><a href="http://www.hit.org.uk">www.hit.org.uk</a></td>
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<tr>
<td>Home Office Drugs Prevention</td>
<td><a href="http://www.homeoffice.gov.uk/atoz/drugs">www.homeoffice.gov.uk/atoz/drugs</a></td>
</tr>
<tr>
<td>National Drugs Helpline</td>
<td><a href="http://www.ndh.org.uk">www.ndh.org.uk</a></td>
</tr>
<tr>
<td>National Treatment Agency for Substance Misuse</td>
<td><a href="http://www.nta.nhs.uk">www.nta.nhs.uk</a></td>
</tr>
<tr>
<td>NTORS - National Treatment Outcome Research Study Release</td>
<td><a href="http://www.ntors.org.uk/ntors">www.ntors.org.uk/ntors</a></td>
</tr>
<tr>
<td>Scottish Drugs Forum</td>
<td><a href="http://www.sdf.org.uk">www.sdf.org.uk</a></td>
</tr>
<tr>
<td>Trashed (Health Promotion England)</td>
<td><a href="http://www.trashed.co.uk">www.trashed.co.uk</a></td>
</tr>
<tr>
<td>UK Drugs Strategy Site</td>
<td><a href="http://www.drugs.gov.uk">www.drugs.gov.uk</a></td>
</tr>
<tr>
<td>UK Harm Reduction Alliance</td>
<td><a href="http://www.ukhra.org">www.ukhra.org</a></td>
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</table>

**ENVIRONMENTAL HEALTH**

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<th>BSE Inquiry</th>
<th><a href="http://www.bse.org.uk">www.bse.org.uk</a></th>
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<tr>
<td>Chartered Institute of Environmental Health</td>
<td><a href="http://www.cieh.org.uk">www.cieh.org.uk</a></td>
</tr>
<tr>
<td>Environment Agency</td>
<td><a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a></td>
</tr>
<tr>
<td>GreenNet</td>
<td><a href="http://www.gn.apc.org">www.gn.apc.org</a></td>
</tr>
</tbody>
</table>
Greenpeace  www.greenpeace.org.uk
Institute of Food Research  www.ifrn.bbsrc.ac.uk
Joseph Rowntree Foundation  www.jrf.org.uk
Local Agenda 21  www.scream.co.uk/la21
National Radiological Protection Board  www.nrpb.org
Sustain  www.sustainweb.org
The Environment Council  www.the-environment-council.org.uk
The UK National Air Quality Information Archive  www.aeat.co.uk/netcen/airqual
Water Industry Research  www.ukwir.org.uk

ETHNIC MINORITIES
Black Information Link (BLINK)  www.blink.org.uk
Blackliners  www.blackliners.org
Commission for Racial Equality  www.cre.gov.uk
Institute of Race Relations  www.irr.org.uk
Joint Council for the Welfare of Immigrants  www.jewi.org.uk
London Ethnic Health Network  www.doh.gov.uk/london/ethnic
North West Ethnic Health Information Site  www.ethnichealth-northwest.net
Refugees Online  www.refugeesonline.org.uk
The Refugee Council  www.refugeecouncil.org.uk

MENTAL HEALTH
Centre for Evidence Based Mental Health  www.psychiatry.ox.ac.uk/cebmh
Depression Alliance  www.depressionalliance.org.uk
MIND: The Mental Health Charity  www.mind.org.uk
National electronic Library for Mental Health  www.nelmh.org
National Service Framework for Mental Health  www.doh.gov.uk/nsf/mentalhealth
Royal College of Psychiatrists  www.rcpsych.ac.uk
The Mental Health Foundation  www.mentalhealth.org.uk
The Sainsbury Centre for Mental Health  www.scmh.org.uk
The Samaritans  www.samaritans.org.uk

NURSING
British Computer Society Nursing Specialist Interest Group  www.bcsnsig.org.uk
Community and District Nursing Association  www.cdna.tvu.ac.uk
Royal College of Nursing  www.rcn.org.uk
NHS National Nursing Leadership Project  www.nursingleadership.co.uk
NMAP  http://nmap.ac.uk
Nursing and Midwifery Council  www.nmc-uk.org/cms/content/home

OLDER PEOPLE
Age Concern  www.ageconcern.org.uk
Age Positive (DWP)  www.agepositive.gov.uk
Anchor Trust  www.anchor.org.uk
British Geriatrics Society  www.bgs.org.uk
Help the Aged  www.helptaged.org.uk
National Service Framework for Older People  www.doh.gov.uk/nsf/olderpeople

PRIMARY CARE
National Association of Primary Care  www.primarycare.co.uk
National Electronic Library for Primary Care  www.nellh-pc.nhs.uk
National Centre for Innovation in Primary Care  www.innovate.org.uk/frameset.htm
National Primary Care Research & Development Centre  www.npcrdc.man.ac.uk

SEXUAL HEALTH and HIV/AIDS
AVERT - AIDS Education and Research Trust  www.avert.org
British Pregnancy Advisory Service  www.bpas.demon.co.uk
Brook  www.brook.org.uk
Centre for Sexual Health Research  www.socstats.soton.ac.uk/cshr
Department of Health: Sexual Health  www.doh.gov.uk/std
Health Promotion England Lovelife  www.lovelife.co.uk
HIV/AIDS Surveillance in the UK (PHLS)  www.phls.co.uk/facts/HIV/hiv
Lesbian and Gay Foundation  www.lgfoundation.org.uk
Medical Foundation for AIDS and Sexual Health  www.medfash.org.uk
Teenage Pregnancy Unit  www.teenagepregnancyunit.gov.uk
UK National AIDS Trust  www.nat.org.uk

**SMOKING**
Action on Smoking and Health  www.ash.org.uk
Giving Up Smoking  www.givingupsmsoking.co.uk
Quit  www.quit.org.uk
Quit Smoking UK  www.quitmskinguk.com
Roy Castle Lung Cancer Foundation  www.roycastle.org

**OTHER USEFUL WEBSITES**
Centre for Health Economics University of York  www.york.ac.uk/inst/che
Communities for Health  www.communitiesforhealth.net
Health Care UK  www.healthcareuk.com/hcuk/default.asp
Health in Focus  www.healthinfocus.co.uk/cms_anon.pl/home
HealthIndex UK  www.healthindex.co.uk
HealthLinks  www.healthlinks.net
Health on the Net Foundation  www.hon.ch
Health Voice Network  www.healthvoice-uk.net
Healthworks  www.healthworks.co.uk
Help for Health Trust  www.healthytrust.org/index.htm
Homeless Pages  www.homelesspages.org.uk
Kinghill Research Centre  www.kingshill-research.org
Medical Research Council - Institute for Environment and Health  www.le.ac.uk/ieh/index.html
National Academic Mailing List Service  www.jiscmail.ac.uk
National Blood Services  www.bloodnet.nbs.nhs.uk/welcome.htm
National Institute for Medical Research  www.nimr.mrc.ac.uk
National Research Register  www.doh.gov.uk/research/nrr.htm
Policy Studies Institute  www.psi.org.uk
Practice Management UK  www.pmuk.org.uk
Regeneration-uk.com  www.regenerationuk.com
Scottish Health on the Web (SHOW)  www.show.scot.nhs.uk
Surgery Door  www.surgerydoor.co.uk
The Association of the British Pharmaceutical Industry  www.abpi.org.uk
The Institute of Rural Health  www.rural-health.ac.uk
Travel Health  www.travelhealth.co.uk
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<td>3G</td>
<td>Third Generation (advanced mobile phone technology)</td>
</tr>
<tr>
<td>ADSL</td>
<td>Asymmetrical Digital Subscriber Line (method of broadband Internet connection)</td>
</tr>
<tr>
<td>APHO</td>
<td>Association of Public Health Observatories</td>
</tr>
<tr>
<td>BFWA</td>
<td>Broadband Fixed Wireless Access (method of broadband Internet connection)</td>
</tr>
<tr>
<td>CHI</td>
<td>Commission for Health Improvement</td>
</tr>
<tr>
<td>DIES</td>
<td>Department for Education and Skills</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>ECDL</td>
<td>European Computer Driving Licence</td>
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<tr>
<td>GPRS</td>
<td>General Packet Radio Service (advanced mobile phone technology)</td>
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<tr>
<td>GUM</td>
<td>Genito-Urinary Medicine</td>
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<td>HDA</td>
<td>Health Development Agency</td>
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<tr>
<td>HON</td>
<td>Health On the Net Foundation</td>
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<tr>
<td>HTML</td>
<td>Hypertext Mark-up Language (computer language used for the WWW)</td>
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<tr>
<td>ICTs</td>
<td>Information and Communications Technologies</td>
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<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>MORI</td>
<td>Market &amp; Opinion Research International</td>
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<tr>
<td>NCHOD</td>
<td>National Centre for Health Outcomes Development</td>
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<tr>
<td>NeLH</td>
<td>National electronic Library for Health</td>
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<td>NHSIA</td>
<td>NHS Information Agency</td>
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<td>NICE</td>
<td>National Institute for Clinical Excellence</td>
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<td>NGfL</td>
<td>National Grid for Learning</td>
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<tr>
<td>OMNI</td>
<td>Organising Medical Networked Information</td>
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<td>ONS</td>
<td>Office for National Statistics</td>
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<td>PALS</td>
<td>Patient Advice and Liaison Service</td>
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<tr>
<td>PC</td>
<td>Personal Computer</td>
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<tr>
<td>PCIMP</td>
<td>Primary Care Information Modernisation Programme</td>
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<tr>
<td>PCG</td>
<td>Primary Care Group</td>
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<tr>
<td>PCT</td>
<td>Primary Care Trust</td>
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<tr>
<td>PDF</td>
<td>Portable Document Format</td>
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<tr>
<td>PHeL</td>
<td>Public Health electronic Library</td>
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<tr>
<td>TCP/IP</td>
<td>Transmission Control Protocol/Internet Protocol (core Internet protocols governing computer addressing and transportation of data)</td>
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<tr>
<td>Ufi</td>
<td>University for Industry</td>
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<tr>
<td>URL</td>
<td>Uniform Resource Locator (Web address)</td>
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<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
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<tr>
<td>WAP</td>
<td>Wireless Application Protocol (mobile phone technology providing limited access to online information)</td>
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<tr>
<td>WWW</td>
<td>World Wide Web</td>
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