

Refereed papers

Comparing the use of health information/ advice in Birmingham and Hull: a case study of digital health information delivered via the television

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ABSTRACT

Postal questionnaire surveys were carried out with users of two digital interactive television (DiTV) providers of health content to investigate the use made of each service and the users' reactions to service content and its usefulness to them. The research indicated that health information on DiTV was used and, on the whole, rated favourably.

There was some evidence also that such information might be used by some people as a substitute for going to the doctor, though information from

their general practitioner (GP) or practice nurse still carries more weight for most people than any other health information source.

This study forms part of an ongoing research project which has, as part of its aim, the task of identifying particular users with the information sources that may be most appropriate for them.

Keywords: digital television, health information, interactive television

Introduction

The Government is committed to the roll-out of a range of digital information platforms to expand the provision of health information to the general public. The policy document *Information for Health*, for example, is underpinned by the notion that 'access to the right information at the right time is a crucial ingredient of modern health care'.¹ The major National Health Service (NHS) Direct initiative, resulting from this thinking, employs a battery of information services, such as the web (NHS Direct online), telephone 'hotline', touch-screen kiosks and digital interactive television (DiTV).² No doubt mobile phones will

not be far behind. Behind all these initiatives lies the assumption that the very act of providing people with information leads to a better health outcome, although this could, of course, simply mean improving the dialogue between patient and health professional, which might then lead on to better treatment. Studies have, indeed, shown that written information, for example, can increase patient compliance with their general practitioner's (GP's) instructions and so help the healing process, and that information leaflets contribute to better health outcomes.^{3–6} The study described here looks at health information sources and describes a pattern of use and their impact on a health outcome. It is one of a number of studies being undertaken as part of a research project looking at the

impact of digital health information provision on the consumer, conducted on behalf of the Department of Health.⁷

Literature review

A wealth of literature has accumulated on health information needs, although this has been almost exclusively concerned with needs of people with specific ailments, rather than the general public at large. Kai, for example, examined 'disadvantaged' parents' difficulties and the information needs that arose in coping with acute illnesses in their preschool children.⁸ Respondents stressed the need for a wide variety of information, and emphasised the importance of accessibility and ease of understanding. They learned more about specific illness from the media, parenting magazines, television dramas and publicity campaigns than from doctors or the medical literature.

Coulter *et al.* explored patient information needs in the context of an evaluation of information services available to them.⁹ The research elicited 12 specific needs, as identified by patients themselves. Those that would be appropriate for mediation via remote electronic or paper-based means included:

- gaining a realistic idea of prognosis
- making the most of consultations
- learning about available services and sources of help
- identifying self-help groups
- preventing further illness.

In a qualitative study of GP patients that was undertaken as part of the present research, Williams *et al.* identified the following information needs of a sample of women aged between 55 and 74 (this group having been identified by log analysis as low users of a health information kiosk) who were at the surgery for treatment.¹⁰ These included:

- to take prescribed medication successfully
- to understand/provide reassurance about the condition and its severity
- to cope with the condition
- to understand/provide reassurance about the treatment of the condition
- to help make a treatment decision
- to deal with or challenge a doctor.

Pinder developed a typology of a health information seeker from her study of how sufferers and carers coped with the onset and development of Parkinson's disease.¹¹ These were 'seekers', 'weavers' and 'avoiders'. 'Seekers' sought as much information as possible, and used it as a central weapon in their strategies to cope with the disease. 'Weavers' sometimes sought

information, and were selective about that which they took on board. 'Avoiders' coped on the assumption that 'the anxiety of not knowing was preferable to having their ... fears about the condition confirmed'. Leydon *et al.* also found some reluctance to imbibe information, in their study of cancer patients.¹²

It is harder to assess the information needs of those not immediately affected by illness, i.e. members of the public who may require health information for general uses unrelated to specific conditions. Such users may have a curiosity or general interest to stay healthy or an interest to look healthy.

Some work has been carried out on general information seeking and use of electronic information. Cyber Dialogue, for example, found that approximately half of all Internet-using health information seekers advised a family member or friend to see a doctor, changed their exercise or eating habits or made a 'positive' decision related to their health treatment.¹³ A rather mixed bag of information needs is shown in these results, with seekers looking for information on behalf of others to improve their general health or to decide on the next steps they should take with regard to a current condition. Many others joined an illness support group after visiting a disease-specific website. Some work has been carried out on the impact of the Internet on such specialist online groups. Gann reports, for example, that participation in these fora focused around 'peer support and sharing of information on treatment advances, clinical trials etc.'¹⁴

Nicholas *et al.*, in a study of health outcomes, found that people used an Internet health site to be better informed and to help change the way they felt about a condition, and this was particularly true for those searching on someone else's behalf.¹⁵ This implies that users may be using information for peace of mind and reassurance.

As with much else on the web, it is often commercial companies that lead the way in usage research, albeit in a fairly superficial way and with commercial rather than altruistic or academic ends. One interesting study looking at online health information seeking was that carried out by the Boston Consulting Group with European health consumers.^{16,17} Their researchers found that users tend to have a focused and deep interest in information only about their specific condition or disease. They do not regularly surf the web for *general* health-related material, but want sites offering specific information. Those more actively involved in their diagnoses and treatment decisions are more likely to use the Internet as a resource for information.

Much of the literature on the provision and utilisation of online health information to date has been concerned with the Internet and web-based content. This paper reports on a study that investigated another online information medium that is regarded as having

potential in the health context – digital interactive television. In 2001 in the United Kingdom (UK), the Department of Health launched a series of pilots to test the efficacy of television as an interactive health information medium. Four consortia were contracted to test a range of health-related information and advice services supplied over digital satellite, cable and broadband platforms on a national or subnational scale. The authors were also commissioned by the Department of Health to undertake an evaluation of use and users' opinions of these services. The data presented below were taken from part of this evaluative exercise conducted upon two of the four consortia, namely *Living Health* and *NHS Direct Digital*. These two consortia were chosen for this comparative exercise because there was a significant overlap between much of the content they supplied.

Aims, objectives and scope of this study

The aim of this study is to compare the use of health information provided to two geographically distinct user groups by two different DiTV companies. With the sheer size and heterogeneous nature of the health consumer audience, and the fragmented nature of provision, such data are needed so that information providers can better target their dissemination strategies and ensure that the most effective applications are deployed to cater for specific public health needs.

Site backgrounds

Two services are compared: those of *Living Health*, managed by Flextech and distributed by Telewest, and *NHS Direct Digital*, managed by Communicopia and distributed by KIT Interactive. The current paper examines only the on-screen information services of each. However, it is worth describing accompanying transactional elements, to put these services into their appropriate contexts.

The *Living Health* service, available to around 35 000 Flextech cable customers in the Birmingham area, consists of three elements:

- 1 a health information database, accessible on DiTV – the subject of this paper
- 2 a one-way video conferencing facility in which users see a 'live' nurse, who can send images, video etc. to the user's TV set to assist in communication, diagnoses etc.

- 3 a doctors' surgery online booking facility, available to a minority of viewers, and limited to three participating medical locations.

The *NHS Direct Digital* service, available to 10 000 broadband digital TV-on-demand subscribers in the Hull area, consists of two elements:

- 1 text, images, audio and 'on demand' short video programmes, *NHS Direct Digital*, an analysis of which features in this paper
- 2 an online immunisation diary, whereby subscribers can maintain personal immunisation records on their TV set.

The two services are considered in detail below.

Living Health

The main menu of the *Living Health* service offers seven information topics (including health news, men's/women's health, illnesses and treatment), access to NHS Direct InVision and a search facility. The hierarchical menu structure has up to six levels but most sections use four or five. 'Today's Health News' simply gives a submenu of eight current topics of interest which lead directly to content, but in most sections the viewer needs to go stepwise through two to four menus before arriving at information content.

The navigation tools are constant and helpful. It is always possible to return to the home screen, back one menu level, or forward or back to individual contents pages. Each menu page has a clear heading, usually giving the names of each of the preceding sections. Each of the nine sections is additionally colour coded to give an extra visual clue to the viewer as to where they are. It is therefore immediately obvious when the viewer has moved to a different section of the service.

Each subsection is logically organised to enable the viewer, by virtue of the links at the end of the content for each topic, to navigate right through the section from beginning to end, and often directly on to the next section without having to return to the previous menu. Where information content is repeated in various sections, for example 'Contraception', the text has been duplicated within each section using the appropriate headings and colour for that section, rather than taking the viewer into another part of the service.

There is a main search tool which indexes the content of sections 2–7 and additional topics linked to within the other search menus. The extra topics linked to within the other search indices are additional NHS careers, common conditions and common operations. There are four other search facilities, variously linked to common illnesses, common operations, medicines and careers. The medicines index sits discreetly in the 'Illness & Treatment' section. Its contents are not

indexed by the main search facility. To find a topic, the viewer has to select a letter of the alphabet. They are then presented with an alphabetical list of terms. Selecting one takes the viewer to the appropriate part of the service (sections 2–7), appropriately colour coded, in which that topic sits.

There are very few non-textual elements to the content. What images there are, are mostly illustrative (this is what an intrauterine device looks like; this is what a pair of arthritic hands look like) rather than explanatory. Only two instructional images were found by the present authors, one to aid breast self-examination and a sequence demonstrating cardiopulmonary resuscitation.

NHS Direct Digital

The main menu of the *NHS Direct Digital* service is structured on up to four hierarchical menus before arriving at information content. The content pages list, on the right hand of the screen, the other menu options at the same hierarchical level for that particular topic.

Unlike the *Living Health* service, menu pages also contain some introductory content. It is possible that some viewers may read this text only and not proceed further to content at the next level. The principles of navigation are the same as the *Living Health* service. Numbers are used to move forward and backwards through pages and menus, rather than the words 'next page' or 'previous menu'. The name of the previous menu, as well as a digit, is used to guide the viewer back to the previous menu and the menu heading is also displayed on screen. There is much less vertical linking between sections than with *Living Health*, although occasional hyperlinked terms do occur, taking the viewer into a relevant part of another section of the site.

The distribution of content of this *NHS Direct Digital* service differs from the *Living Health* service. There is a greater concentration on conditions and treatment and less on healthy lifestyles and practical advice. The content is more focused on medical information than on information on coping, self-help and the emotional aspects of life. Unlike *Living Health*, the content is not targeted at specific groups (men, women and children). The information is also largely accessible only through a search menu system. Only the 'Healthy Living' section (and to some extent the 'First Aid' section) flow and feel like integrated systems of information. The lack of vertical linking also contributes to this feeling.

FEATURES

Rolling features appear on the main menu screen. These link to various parts of the site. An index of the

features exists as a menu but this menu is not linked to by any other part of the site. Examples of features topics are:

- alcohol and prescription drugs
- am I getting enough protein?

Some of the features are also details of current health campaigns below.

NOT FEELING WELL?

This part of the service allows the viewer to choose a part of the body (head and chest, abdomen, limbs or skin) and to choose from a list of possible symptoms, or to choose from a full list of all 54 symptoms. (Unfortunately, this list has not been sorted alphabetically, but puts the four previous menus on top of each other!) The viewer then has to answer yes or no to a series of questions which leads them to a possible diagnosis and a suggested course of action, such as 'see your GP' or 'phone 999'.

A–Z OF CONDITIONS

This section lists 274 conditions, more than the *Living Health* service, which lists a total of 157 conditions and operations. The section contains 3661 pages of information. For each condition, information includes symptoms, causes, diagnosis, prevention and treatment.

There are also sections on 'First Aid', 'Medicine Cabinet' (a searchable A–Z index of 149 medicines), 'Healthy Living' and 'Local Information'. The latter includes information on blood donation (including a video) and details of local doctors, hospitals and pharmacies. There is a wealth of non-textual information, including 95 videos. These include material on 14 medical conditions. As already mentioned, 49 medical conditions include images.

Methods

Data were obtained from two postal questionnaires:

- 1 a questionnaire was sent out with literature promoting the *Living Health* channel to all potential Telewest Birmingham subscribers, comprising approximately 35 000 households: 723 were returned and analysed
- 2 a questionnaire was sent to all potential KIT Interactive subscribers in the Hull area. In all this reached about 10 000 households: nearly 1200 were returned.

The questionnaire in both cases was designed to obtain information on the use and non-use of digital television for health information. Furthermore, it asked

for personal information details as well as asking users to rank the importance of a variety of other sources for health information. This paper focuses on part of the questionnaire – the user's scoring of health information sources. Analysis of correlation coefficients is used to identify possible differences between the services. Use is also made of regression analysis to examine if any specific variables could be identified as significantly determining the user's choice of information source.

Respondents

More females (53%) responded to the Telewest survey than males (46%); however the reverse was true of the KIT survey, where more men than women responded: 54% compared to 46%. Furthermore, 19% of KIT respondents were aged between 66 and 75 (Figure 1), and only 32% were aged under 45. The age profile of KIT respondents is significantly older than that of Telewest respondents (Figure 2): 24% of Telewest respondents were aged 36–45 and 22% were aged 26–35. Therefore more than half (53%) of the Telewest respondents were aged under 45, which clearly exceeds the proportion (32%) of KIT subscribers who fell into this age group.

Results

Most important health sources

Today people can use a variety of information sources to help them keep healthy or tackle a particular ailment.

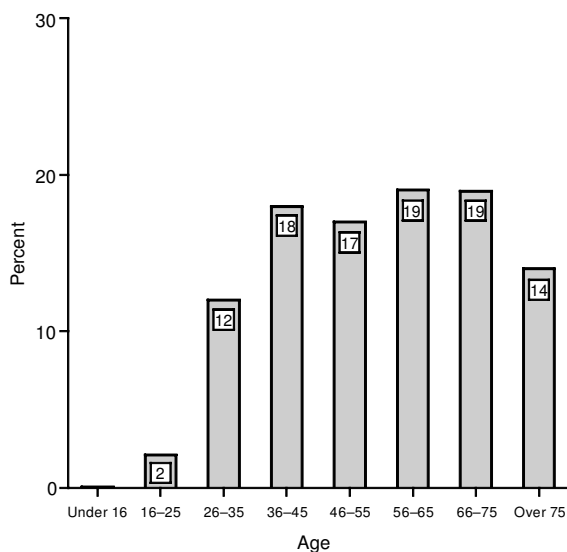


Figure 1 Age distribution of KIT subscribers

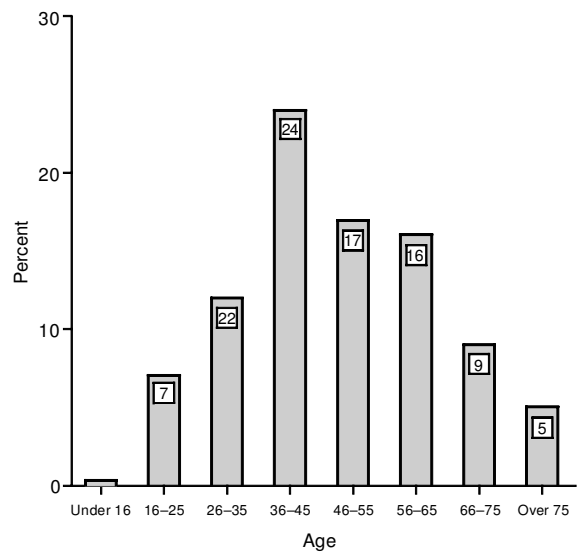


Figure 2 Age distribution of Telewest subscribers

With an ever-increasing range of sources available, many now in a digital form, we might expect that people are using even more sources. What we wanted to determine was how they rated these sources comparatively, and where DiTV was ranked among these. Figures 3 and 4 show how DiTV viewers surveyed here rated a variety of information sources, including information from the doctor, health books, the web and television.

The two sources that scored highest for both groups of subscribers were information from their own doctor and the practice nurse. The scores for both KIT subscribers and Telewest subscribers for information from the doctor were identical: 3.7, and for the practice nurse near identical: 3.1 (KIT) and 3.2 (Telewest). Scores were given out of 4 where 4 indicated the information source as very important. We might expect the doctor and nurse to be considered the most important

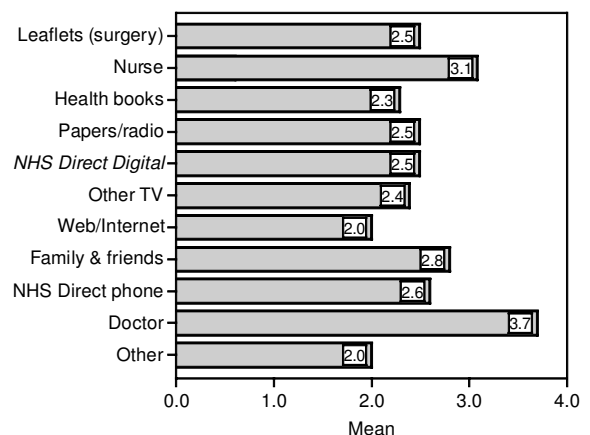


Figure 3 How important are the following sources of health information to you? (KIT)

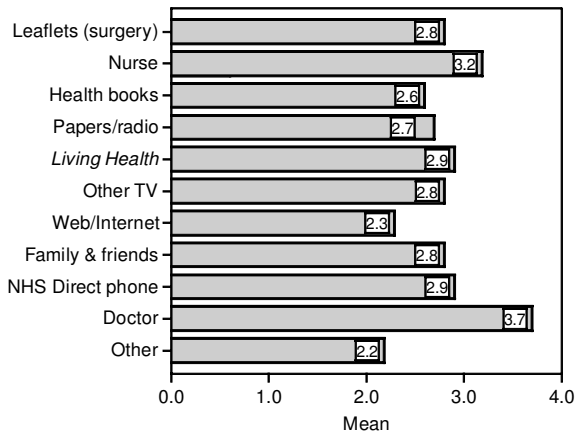


Figure 4 How important are the following sources of health information to you? (Telewest)

information source – the medical equivalent of the horse's mouth. More surprising perhaps, the order of importance of the remaining sources was different between KIT and Telewest subscribers. KIT subscribers rated family and friends (2.8) and the NHS Direct phone line (2.6) as the next two most important sources, while Telewest subscribers placed information via DiTV provided by *Living Health* (2.9) and the NHS Direct phone line (2.9) as next highest rated sources. The web was rated the least important source of information by both sets of subscribers and scored just 2 by KIT subscribers and 2.2 by Telewest subscribers.

Comparing the two DiTV health information services, *NHS Direct Digital* (managed by Communicopia and distributed by KIT) scored 2.5 while *Living Health* (managed by Flextech and delivered by Telewest) scored 2.9. This result suggested that Telewest subscribers were happier with their DiTV service than KIT subscribers were with theirs. This difference might have occurred because of the differences in the demographic profile of Hull and Birmingham users, because of poorer marketing of the KIT service or as a result of differences between the services delivered.

Health topics and information sources

Respondents were also given a list of health topics and asked to score their interest on each topic. Scores again were out of 4, where a 4 indicated that the source was of particular interest. It was decided to correlate the users' rating of information sources against the users' ratings of interest in health topics with the aim of identifying which sources were used for which health topic. Correlations were generated first for KIT subscribers (Table 1) and then for Telewest subscribers (Table 2). Correlation coefficients with a value greater than 0.19 are reported.

For KIT subscribers, medical books and magazines were important information sources for medical news ($r = 0.40$), complementary medicine ($r = 0.39$), new treatments ($r = 0.31$) and exercise ($r = 0.30$). Papers and the radio, unsurprisingly perhaps, were sources used for medical news ($r = 0.35$) while for children's health, both family and friends ($r = 0.30$) and the NHS Direct phone line ($r = 0.35$) were important information sources. The NHS Direct phone line was also considered an important information source for new treatments ($r = 0.30$). The *NHS Direct Digital* DiTV service was found to be an important source for prescription drugs ($r = 0.31$) and new treatments ($r = 0.35$). In terms of the surgery environment, leaflets in the surgery were used by KIT subscribers for information on prescription drugs ($r = 0.32$) and new treatments ($r = 0.33$) and the nurse was identified as an important source for prescription drugs ($r = 0.33$), new treatments ($r = 0.31$) and general health ($r = 0.32$). Information from the doctor did not relate particularly highly to any of the topics listed, this source perhaps being reserved for diagnostic advice and prescriptions.

For Telewest subscribers medical books and magazines were reportedly used far more widely, although the values that give an indication of the importance of the source for medical news ($r = 0.41$), complementary medicine ($r = 0.37$), new treatments ($r = 0.30$) and exercise ($r = 0.30$) are the same as for KIT users. Books and magazines for Telewest subscribers are also used for general health ($r = 0.34$) and their own medical research ($r = 0.31$). The role of leaflets in the surgery was also quite different and was identified as a source for medical news ($r = 0.32$), medical research ($r = 0.30$) and general health ($r = 0.31$). Like KIT users, the papers and the radio were considered important for medical news ($r = 0.30$). The NHS Direct phone line was also considered an important information source for new treatments ($r = 0.30$) while the web was rated as important for complementary medicine. Surprisingly, the *Living Health* DiTV service was identified as important for all topics except diet and exercise and this reinforces the observation that the available content on *Living Health* was wider than *NHS Direct Digital's* and, importantly, was both used and appreciated. The highest correlations were recorded with medical news ($r = 0.39$), new treatments ($r = 0.38$), general health ($r = 0.37$) and prescription drugs ($r = 0.36$). Information from the nurse for the selected topics was lower than that recorded for KIT subscribers and that from the doctor barely registered. This is surprising and is thought to relate to either differences of the role and trust of the doctor between the two locations or to differences in how information sources were used. These include an increased use of leaflets in the surgery and of the *Living Health* information service: both scored higher correlations compared to KIT

Table 1 Correlation values* between how important an information source is and interest in a health topic: KIT subscribers

	Medical books and magazines	Leaflets (surgery)	Papers/ radio	Family/ friends	NHS Direct phone line	Web/ Internet	NHS Direct Digital	Other TV	Nurse	Doctor
Prescription drugs	0.25	0.32	0.19	0.19	0.24		0.31	0.21	0.33	0.22
New treatments	0.31	0.33	0.24	0.22	0.30		0.35	0.25	0.31	0.23
Healthy living	0.27		0.23					0.22	0.20	
Medical news	0.40	0.27	0.35	0.18	0.21	0.23	0.29	0.31	0.22	
Complementary medicine	0.39		0.27	0.19	0.25	0.22	0.25	0.28	0.19	
Diet	0.23		0.18						0.18	
Specific condition	0.22	0.23			0.19		0.24	0.18	0.27	0.20
Medical research	0.25	0.29	0.20		0.25		0.27	0.25	0.31	
General health	0.23	0.25		0.19	0.23		0.26	0.19	0.32	0.19
Children's health	0.23	0.22		0.30	0.35		0.28	0.25	0.21	
Exercise	0.30		0.22		0.20		0.20	0.20	0.19	

*Correlation coefficients (Spearman's) with a value of 0.19 or greater are displayed.

Table 2 Correlation values* between how important an information source is and interest in a health topic: Telewest subscribers

	Medical books and magazines	Leaflets (surgery)	Papers/ radio	Family/ friends	NHS Direct phone line	Web/ Internet	<i>Living Health</i>	Other TV	Nurse	Doctor
Prescription drugs	0.21	0.26		0.20	0.27		0.36	0.28	0.22	
New treatments	0.30	0.28	0.20	0.21	0.30	0.25	0.38	0.30	0.26	
Healthy living	0.31	0.22	0.19	0.23	0.25	0.21	0.31	0.26	0.22	
Medical news	0.41	0.32	0.30	0.22	0.26	0.25	0.39	0.37	0.21	
Complementary medicine	0.37	0.31	0.29	0.28	0.28	0.30	0.31	0.30	0.25	
Diet	0.28		0.21	0.19	0.20		0.23	0.21	0.19	
Specific condition	0.20	0.21			0.28		0.30	0.26	0.21	0.19
Medical research	0.31	0.30	0.25	0.21	0.24	0.23	0.31	0.34	0.19	
General health	0.34	0.31		0.24	0.29		0.37	0.36	0.28	0.19
Children's health	0.38	0.33	0.31	0.29	0.29	0.25	0.30	0.34	0.23	
Exercise	0.30	0.25	0.20	0.20	0.19	0.19	0.24	0.21	0.20	

*Correlation coefficients (Spearman's) with a value of 0.19 or greater are displayed.

subscribers and suggest an increased impact by these two sources.

There was a difference between how viewers have used the two DiTV health services. Clearly both services were used but the coefficients recorded for *Living Health* were higher than those recorded for *NHS Direct Digital*. Table 3 gives the difference, as a percentage of the *NHS Direct Digital* figures. The largest differences were recorded for the use of healthy living information. *Living Health* recorded a score on healthy living that was 72% higher than that for *NHS Direct Digital*. Furthermore, *Living Health*'s score on diet was 64% higher, on general health it was 42% higher and on medical news 34% higher. These results suggest perhaps that either KIT subscribers were not replacing their existing sources with the information provided by *NHS Direct Digital* in these areas or that this service needs to be improved in these areas. It also seems that neither service got their exercise or diet health information content quite right. This is suggested by the relatively poor correlations here and indicated that users were using other sources of information for these areas (mainly books and magazines).

Using health information sources as an alternative to visiting the doctor

The impact of digital information provision on other parts of the health service is always in the minds of health managers and policy makers. To determine whether there were any signs of this impact, subscribers to the Telewest and KIT services were asked the question: 'Have you used medical information that

you have found as an alternative to seeing the doctor?' They were asked this immediately after a question asking what sources they used for medical information. Figures 5 and 6 give the percentage of subscribers from each service who had used information in this way.

A logistic regression model was used to explore which information source factors were likely to have an impact on the respondent's visit to the doctor. The analysis only includes information sources (excluding the practice nurse and doctor), age and gender. Table 4 lists the significant coefficients. The reported use of the NHS Direct phone line, the DiTV services, the web and medical books were found to be significant predictors in both models. Other sources, such as family and friends, leaflets in the surgery and other TV programmes, were not.

For both models, medical books were the most important factor in terms of an information source that a user might use as a substitute for a visit to the doctor. Telewest and KIT subscribers who were very interested in this information source were 3.5 and 2.5 times, respectively, more likely to use information found as a substitute for a visit to the doctor compared to those not at all interested. Additional analysis showed that the use of papers and magazines were closely related to the use of medical books. Hence users who tended to use health books would also use health information drawn from newspapers and the radio. Figure 7 looks at the relationship for Telewest subscribers. While just 30% of subscribers who were not at all interested in medical books and magazines substituted information found there for a visit to the doctor, this was true of 71% who considered this source as very important.

Table 3 Correlation values between interest in a health topic and how important *Living Health* and *NHS Direct Digital* is as an information source

	<i>NHS Direct Digital</i>	<i>Living Health</i>	% difference
Prescription drugs	0.31	0.36	16
New treatments	0.35	0.38	9
Healthy living	0.18	0.31	72
Medical news	0.29	0.39	34
Complementary medicine	0.25	0.31	24
Diet	0.14	0.23	64
Specific condition	0.24	0.30	25
Medical research	0.27	0.31	15
General health	0.26	0.37	42
Exercise	0.20	0.24	20

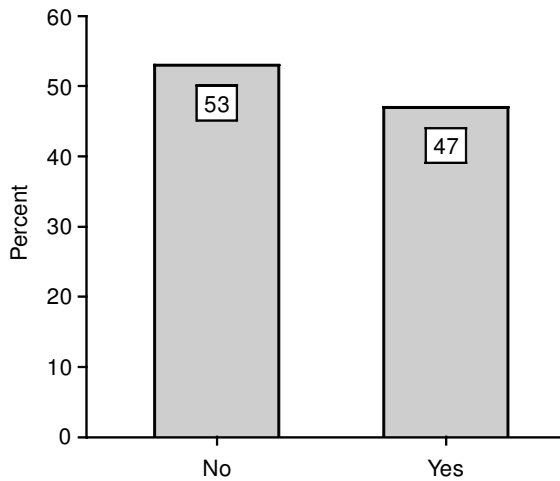


Figure 5 Have KIT subscribers used health information found by themselves as an alternative to seeing the doctor?

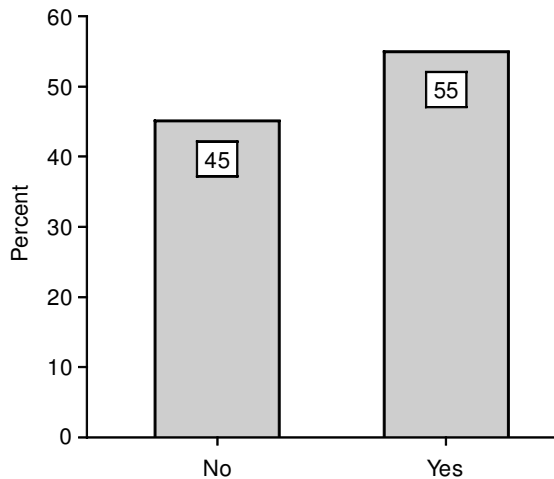


Figure 6 Have Telewest subscribers used health information found by themselves as an alternative to seeing the doctor?

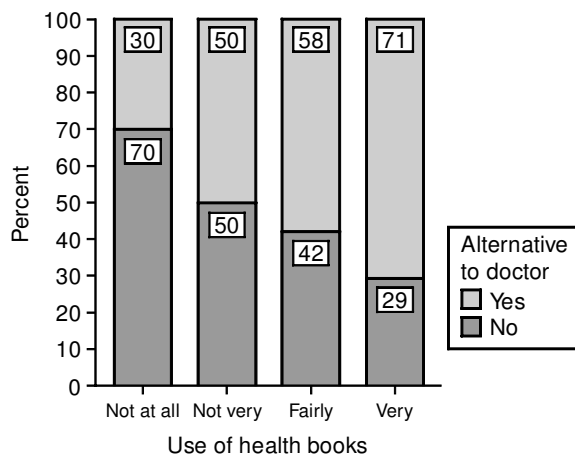


Figure 7 Importance of health books for medical information as an alternative to seeing the doctor (Telewest)

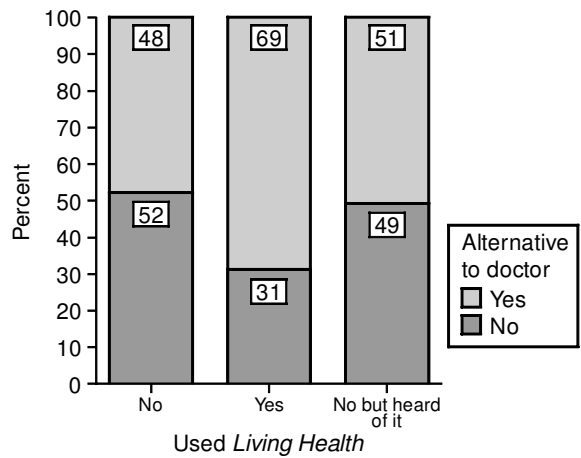


Figure 8 Ever heard of a service called *Living Health* and used this information as an alternative to seeing the doctor? (Telewest)

The second most important source for Telewest users was the *Living Health* service. The key finding for the current study is that respondents who had reportedly used the *Living Health* service were just under twice as likely as non-users to say they would use medical information sources as an alternative to seeing the doctor. The bivariate relationship is reported in Figure 8. This is a significant indication that health information delivered via DiTV had an impact on this outcome. The finding was also true of KIT users using the *NHS Direct Digital* service, but the result was only significant at the 10% significance level and the estimated log odds was lower: 1.39 compared to 1.79. This suggested that the impact of the *NHS Direct Digital* service was lower on this outcome variable compared to the *Living Health* service.

Use of the NHS Direct phone line also had an impact on this outcome. Respondents who had reportedly used the service were about 1.5 times more likely than those who had not to say that they had used information found as an alternative to seeing the doctor. The estimated odds ratios between Telewest and KIT subscribers were surprisingly similar, 1.47 compared to 1.54. The telephone help service appears therefore to provide a functional alternative to seeing the doctor with approximately the same effect in Birmingham as in Hull.

The use of the web was also significant in both regions. Those users who said they were very interested in the web were about twice as likely to use information found as a substitute for a visit to the doctor as were those users who did not use the web at all as an information source. The estimated odds ratios between Telewest and KIT subscribers were again similar, 2.06 compared to 2.03. This suggests that the impact of the web was much the same in Birmingham as in Hull – we might expect this as there

Table 4 Have you used the medical information you have found as an alternative to seeing the doctor?

Variable in model	Telewest subscribers		KIT subscribers	
	<i>n</i>	Log odds ratio (SE)	<i>n</i>	Log odds ratio (SE)
Gender				
Male	290		497	
Female	327	1.73** (0.18)	439	1.33* (0.15)
Age				
35 and under (1.55)	192		156	
36 to 55	258	0.96 (0.21)	362	1.17 (0.21)
56 and over	167	0.53* (0.21)	418	0.77† (0.21)
Have you phoned NHS Direct in the last 12 months?				
No	429		714	
Yes	188	1.47* (0.20)	222	1.54** (0.17)
As a subscriber have you ever heard of <i>Living Health/NHS Direct Digital</i> service?				
I didn't know about it	164		354	
I have used it	138	1.79* (0.26)	280	1.39† (0.17)
I know about it but haven't used it	315	1.00 (0.21)	302	0.95 (0.17)
How important are leaflets in the surgery for your medical information?	Not significant			
How important are health books/magazines for your medical information?				
Not at all	66		169	
Not very	179	1.95* (0.34)	359	1.74** (0.21)
Fairly	277	2.30* (0.33)	323	2.26*** (0.22)
Very	95	3.54** (0.39)	85	2.63** (0.30)
How important are the papers, radio etc. for your medical information?	Not significant			
How important are other TV programmes for your medical information?	Not significant			
How important is the Internet/web for your medical information?				
Not at all	169		369	
Not very	127	1.43 (0.26)	236	1.32 (0.19)
Fairly	201	1.26 (0.24)	240	1.16 (0.19)
Very	120	2.06* (0.28)	91	2.03** (0.27)
How important are friends/family for your medical information?	Not significant			

Levels of significance (Wald's statistic): †<0.1, **P* < 0.05, ***P* < 0.01, ****P* < 0.001

would be little difference in what the web offers between the two locations.

In terms of personal characteristics, age and gender of the respondent were also significant. Those aged 56 and over were about half as likely to use information from sources found as an alternative to a visit to the doctor compared to younger age groups. Surprisingly, this was less true for KIT subscribers compared to Telewest subscribers. This finding was consistent with previous research on the use of consumer health information on the Internet.¹⁸ This may reflect higher levels of digital literacy amongst the younger respondents. Alternatively, the health problems experienced by older users may well be beyond the scope of the

information provided by digital information sources, as they now stand. Gender was also significant, with women being just under twice as likely to use information found as an alternative compared to men, but this was more true of Telewest subscribers than of KIT subscribers.

Conclusion

This study found that information from a GP or practice nurse is, as expected, rated the highest.

However, users do not just use these sources for information on healthy living, medical news, alternative medicine, diet, research and exercise. Rather, users generally seem to prefer to use them in tandem with other sources. This study found that for general health information Telewest users preferred to use the *Living Health* service and health books and magazines. Further, people will substitute information found from their preferred mediated sources for a visit to the doctor, giving a clear indication of the usefulness and importance of the information found. This study has demonstrated that a wide variety of information sources are used, though accessibility of the source is important.

This paper compared the two DiTV information sources under consideration where common measures had been used in each case. It was found that KIT subscribers in Hull rated family and friends (2.8) and the NHS Direct phone line (2.6) as the next two most important sources of health-related information after their doctor and nurse, while Telewest subscribers in Birmingham rated the DiTV service *Living Health* (2.9) and the NHS Direct phone line (2.9) as key information sources. For KIT users, the *NHS Direct Digital* service was rated fifth in importance as an information source, while for Telewest users the comparable service *Living Health* was rated higher at third.

In a correlation analysis between rated importance of sources of information and rated interest in health topics, *Living Health* scored correlations of 0.3 or greater in eight of the ten health topics while *NHS Direct Digital* scored 0.3 or higher correlations in two of the ten topics. *Living Health* recorded higher scores for healthy living (72% higher), diet (64% higher), general health (42% higher), medical news (34% higher) and specific conditions (up by 24%). Such findings indicate that the *Living Health* service scored more favourable impressions among its users in Birmingham than did the *NHS Direct Digital* service among its users in Hull.

In terms of sources of information used, users of the *Living Health* service were just under twice as likely as non-users to say they would use medical information found as an alternative to seeing the doctor. The finding was also true for users of the *NHS Direct Digital* service but the result was only significant at the 10% significance level, lowering confidence in the robustness of this result; the estimated odds was considerably lower at 1.39.^a Thus, *NHS Direct Digital*

users were only about 1.3 times more likely to use medical information found from another source as an alternative to seeing the doctor. This suggests that the impact of *NHS Direct Digital* was lower on this outcome variable compared with the *Living Health* service. Of the sources found significant to this outcome variable, the *Living Health* service ranked second below books and magazines, but above the NHS Direct phone line. For KIT users the *NHS Direct Digital* service was ranked last.

The current research serves to illustrate the initial promise of DiTV as a health information platform. As with any other new information and communication technology, a certain amount of time will need to elapse before it becomes established. This is particularly true of its likely use by sections of the population who are more laggardly in their adoption of innovations. Nonetheless, the results reported in this paper indicate that these services will attract custom and that the information they can supply does have value for users. What has also emerged, however, is that there may be variations in performance between different DiTV information suppliers. While it may be tempting to draw conclusions about the relative service quality of different DiTV operations, in the case studies examined here it is important to recognise that there were other factors that may have affected user uptake and reactions. *Living Health* was distributed over a cable television platform, while *NHS Direct Digital* was carried by a broadband platform. The configuration of the transmission environment was different in each case, which had implications for service access. Furthermore, there were qualitative differences between the two services in the nature of the information they supplied. While *Living Health's* services were mostly text based, *NHS Direct Digital's* used a mixture of text and video formats. The impact of these features on the uptake and use of online health information services supplied via DiTV needs to be further clarified through future investigations, assuming these services are rolled out on a more permanent basis.

classified into two populations. It is used here with regard to the outcome if a user uses information found as an alternative to seeing the doctor. Either the user did or they did not. In particular the model is used to decide which user characteristics, in this case which information sources were used, are predictive or significant on the outcome occurring. In addition logistic regression estimates odds, that is, it says something about the impact of each information source on the outcome. The odds are the likelihood of the outcome occurring given the user-graded importance of each information source. See Hosmer and Lemeshow for more discussion on logistic regression: Hosmer DW and Lemeshow S (1989) *Applied Logistic Regression*. John Wiley & Son: Chichester.

^a Logistic regression was used in the second part of the analysis. Logistic regression is similar in concept to least squares linear regression, though its procedures, assumptions and underlying statistical model are different. Logistic regression is used whenever an outcome event can be

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CONFLICTS OF INTEREST

None.

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