Vulnerable Consumers In Switchover – Who Are They And Where Do They Live?

a report prepared for the

Ofcom Consumer Panel

by

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1 Introduction

1.1 Background

This report was commissioned by the Ofcom Consumer Panel to identify groups of vulnerable consumers in relation to aspects of digital switchover (DSO). Based on a review of publicly available research that has been conducted to date it also details the characteristics of the vulnerable groups identified, including their numbers in society, and quantifies the extent of their vulnerability. The report notes areas where new data could be useful in better describing groups of vulnerable consumers.

This report constitutes the first of three phases in the Ofcom Consumer Panel's preparation of a larger report for the Secretary of State for Culture, Media and Sport. The focus of the final report is an indication of the range of measures that might be needed to ensure that the interests of vulnerable consumers are protected through DSO.

1.2 Scope

Vulnerability arising specifically from digital switchover
This report is focused tightly on issues that vulnerable consumers are likely to face as a direct result of the need to adopt digital TV in the context of DSO.

Vulnerable with regard to basic use of digital TV
The report limits itself to consideration of basic use of digital TV services – that would in essence allow a consumer to experience a digital facsimile of current analogue TV services (Channel selection from BBC1, BBC2, ITV1, C4 and Five, volume control, text services and subtitles) – and not advanced use of interactive digital TV services.

Consumers' general skills, attitudes towards and confidence with technology can predict the extent to which they will explore and interact with new interactive products and services. Within the population generally then there is variation in consumers' capacity to benefit from the new information and entertainment services provided by digital TV. Whilst vulnerable consumers may have difficulty accessing such services, these are aspects of digital TV that are only encountered in advanced usage and any vulnerabilities specifically related to such use are not included within the scope of this report.

Considering groups identified as vulnerable by the Communications Act (2003)
The Communications Act (2003) requires the Ofcom Consumer Panel to consider the interests of a number of groups of consumers. These include: (a) consumers in each of the four nations; (b) elderly consumers; (c) consumers on low incomes; and (d) consumers with disabilities. A working definition of Vulnerable Consumers for the purposes of this report, encompassing the above and other consumers, is provided in Section 2.

Who, how and where – and what we don't know
Presented in this report for each group of vulnerable consumer covered is an overview of why the group is considered vulnerable, the issues the group faces in adopting and using digital TV, and characteristics of the group (where data is

available). In addition, the report identifies gaps in current research that limits the confidence with which it is possible to describe the groups.

Potential benefits to Vulnerable Consumers of digital TV
Focusing only on the provision to vulnerable consumers of the same services they currently receive on their analogue TVs limits the possibility of communicating additional accessibility and content benefits that digital TV is already able to, or could in future, provide to some vulnerable consumers. A switch to an all digital version of current analogue services without reference to the increased functionality offered by digital TV could be perceived as constituting a cost, with little identifiable benefit to consumers. For this reason, where appropriate, we have included in our analyses of the hurdles and barriers faced by the groups of vulnerable consumers discussed in this report, potential benefits that access to the more advanced aspects of digital TV services could offer. These benefits could constitute important foci of future switchover related communications initiatives.

1.3 Approach

The current report is a digest and overview of relevant published research; it is not based on new primary or unpublished/ confidential research.

2 Defining Vulnerable

For the purposes of this report, consumers are defined as *vulnerable* if:

- in obtaining via digital TV the TV services they currently receive through analogue broadcasts and equipment, they are likely to experience difficulties *ARISING FROM*
- limitations across (one or more of) a range of domains including their:
    - physical abilities (dexterity and mobility),
    - sensory abilities (vision and hearing),
    - cognitive abilities,
    - linguistic abilities,
    - geographic location,
    - economic resources.

It is important to note that several of the ability related domains are related to the ageing process – **elderly people** are more likely to suffer physical, sensory and cognitive impairments than are younger people.

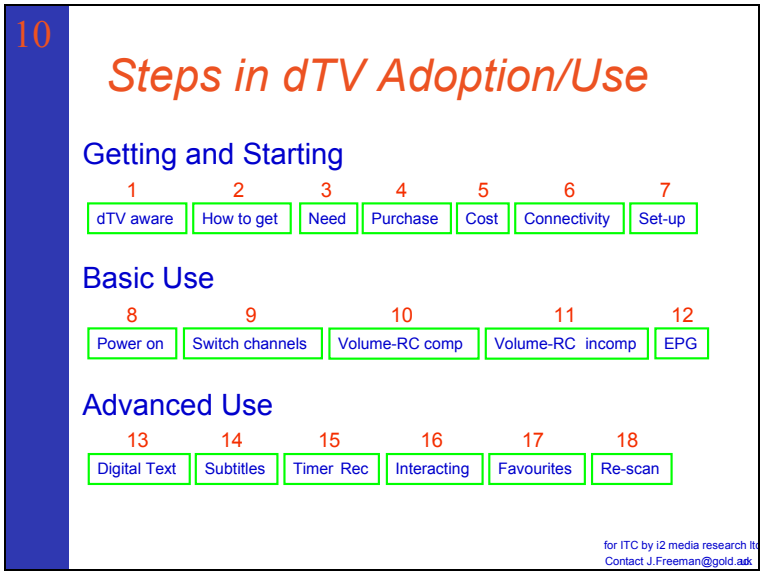
A framework for targeted solutions – based on the adoption process
The process of adoption and use of digital TV by any consumer – vulnerable or otherwise – has been analysed and described in previous research (e.g., Easy TV 2001, 2002; DTI & Generics, 2003). The benefit of identifying an adoption and use process is that it is possible to estimate the impact of each step in the process on each of our vulnerable groups, thereby providing a framework for targeted solutions.

3 The adoption and use process

Figure 1 details steps in the process of becoming a digital TV consumer. For different consumers with different skills, attitudes and resources, different steps in the process will offer challenges of varying impact. A single step in the process could constitute a hurdle (i.e., a surmountable barrier) for some consumers, a barrier (i.e., potentially insurmountable, dependent on consumer's motivation) for others, and to others pose no problem. Analysing adoption and use as a process with distinct temporal stages can assist in providing an estimate of the likely beneficial impact of improvements or adaptations to various steps. For example, an understanding of which steps can cause problems for different types of consumer coupled with a knowledge of the relative prevalence of the different types of consumer in the population provides a means of prioritising various interventions.

An understanding of the temporal relationship between the steps – at its simplest acknowledging that getting digital TV and installing it is a precursor to using it – can also assist in designing optimally effective solutions. In describing characteristics of groups of vulnerable consumer in this report, reference will be made to steps in the "Getting and Starting" and "Basic Use" stages shown in Figure 1. In addition, given the extent to which some vulnerable consumers currently use analogue text services and subtitles, and the extent to which it is necessary for a user to develop a new mental model of the interaction required to access them on digital TV, the report will consider access to text and subtitles, previously considered steps in "Advanced Use"[1, 2].

Figure 1: Breakdown of steps in adopting and using digital TV



[1] In previous research for ITC and Ofcom, i2 media research ltd. has developed a segmentation of UK media consumers, based solely on variations in their attitudes towards media, technology and digital TV. The different groups of consumer varied strongly in technology penetration rates (such as digital TV, PC/internet, and broadband penetration), and also in the extent to which usability issues affect them. The reader is referred to the Easy TV 2002 research report for further information. i2 has subsequently considered how different steps in the adoption process of digital TV might constitute hurdles or barriers of varying magnitude for people from different segments, and how understanding the attitudes of different segments can inform communications with the general public about digital TV.

[2] For consistency with Generics' reports, the terminology and the steps in the the getting & starting, basic use and advanced use stages are as referred to by Generics (2003).

"Getting and Starting" to use digital TV, comprises the following steps:

- Being aware of digital TV
- Knowing how to get digital TV (for at least one platform)
- Purchasing digital TV, cost permitting
- Self-installation and connecting to existing equipment*****
- Set-up of the equipment*****

*** for Digital Terrestrial Television only**

"Basic Use" of digital TV, comprises the following steps:

- Switching it on
- Switching channels
- Changing volume (with a remote control for the digital TV set top box that is compatible with the TV set, or using the TV remote)
- Using Electronic Programme Guide

Whilst they are usually referred to as steps in "Advanced Use", two further steps warrant consideration in this report because they are used regularly with analogue TV, especially by some vulnerable consumers:

- Use of Digital Text
- Use of Subtitles

4 Vulnerable Consumers in Digital Switchover

4.1 Groups of Vulnerable Consumers and the Issues They Face

In this section, groups of vulnerable consumers are first described with reference to the impact of discrete impairments. Of course, categorising vulnerable consumers into discrete groups on the basis of specific impairments is not an accurate representation of the situation. As already mentioned, limitations across several of the ability related domains (cognitive, sensory and physical) are related to the ageing process. Further, consumers with more significant impairments tend to have lower incomes, as they are more likely to be unemployed and/or on benefits. Whilst some vulnerable consumers are vulnerable as a result of reduced ability in one domain (be it a visual or auditory impairment for example), many vulnerable consumers are vulnerable as a result of reduced abilities in more than one domain; with for example more than one ability related impairment (e.g., a hearing impairment co-occurring with a dexterity impairment) accompanied by the consumer having a low income.

In section 4.2, the report attempts to prioritise issues faced across all vulnerable consumers. The issues have been prioritised based on (a) how common a specific impairment or limitation is (based on published estimates of their prevalence in the UK population), (b) the likelihood of a specific impairment co-occurring with any other vulnerability (again, where data is available) and (c) the impact the impairment can have on various stages of the adoption and use process.

It is important to note that whilst some issues for vulnerable consumers apply to some extent across all digital TV platforms (satellite, cable and terrestrial), issues specifically related to connectivity, self-installation and set-up are only relevant to digital terrestrial TV, as satellite and cable operators install in consumers' homes the set-top boxes used to receive their respective services[3].

Whilst the major focus of this report is to identify issues that vulnerable consumers experience, where appropriate it is important to highlight the positive potential that digital TV can have for some groups of vulnerable consumers.

The reader is reminded that the issues detailed in this report are only those that arise for vulnerable consumers specifically as a result of digital switchover and the consequent requirement on consumers to use digital, instead of analogue, TV.

4.1.1 Visually Impaired Consumers

Whilst accessibility for visually impaired consumers is an issue in relation to analogue TV, the issue has the potential to be much exacerbated in relation to digital television. For example, with current digital television services there is usually a heightened reliance on on-screen displays for channel selection (e.g., using the now and next TV schedule, or a full electronic programme guide). In this context, the

[3] Whilst DTT is the only self-install platform, it is important to recognise that set-top boxes on all platforms could require some form of intervention that is similar in complexity to set-up and installation at some point – for example if SCART or RF leads become disconnected (accidentally or in the process of moving equipment), or the set-top box crashes.

importance of designing digital TV systems and services that are accessible to people with visual impairments is accentuated.

Whilst television is predominantly a visual medium, it is a key source of information for consumers with visual impairments just as it is for consumers without visual impairment. Visual impairments (both in terms of acuity – a measure of the detail a person can resolve visually; and field of view) are common across age. Whilst many people have corrected-to-normal vision (glasses and contact lenses), many people have out of date prescriptions or fail to regularly wear their glasses or contact lenses.

Definition	• Visual impairment can range in severity from complete blindness, through to impaired field of view and acuity to uncorrected but correctable visual acuity impairments (e.g., short and long sightedness, astigmatism)
	  ○ A person is defined as legally blind if the visual acuity of their best corrected eye is 3/60 [meaning they can recognise at a distance of 3ft what a person with no visual impairment could recognise at 60ft]
	  ○ A person is defined as having a visual impairment if the visual acuity of their best corrected eye is 6/18 [meaning that they can recognise at a distance of 6ft what a person with no visual impairment could recognise at a distance of 18ft]
	  ○ Many visual impairments include interference to or reduction of the field of view (e.g. tunnel vision, macular degeneration, cataracts, diabetic retinopathy)

Why Vulnerable from DSO **(getting digital TV and basic use only)**	• Installation and set-up of a new DTT STB difficult (or impossible, depending on severity of sight impairment) e.g., if cannot easily see installation instructions, or connections on back of TV and STB, or on-screen calls to action • Intermittent calls to action (e.g., advising of availability of a new software download) could confuse a viewer if not seen – i.e., STB might appear unresponsive • New interaction and control mechanisms to operate digital TV can involve more steps (and hence be less accessible) than 'known' interaction with current analogue systems, and yet must be learnt if analogue is switched off[4]. • New remote control layout and functionality to learn - can be assisted by good design • Typical installation requires use of more than one remote control • User typically required to ensure two devices are switched on (TV and STB) and to desired channel(s) • Channel selection can require 3 digit entry (e.g., '101' for BBC1) within a short duration window, often with no auditory and only limited visual feedback; this is likely to cause difficulties for this user group (channel change using up and down key easier) • TV volume control is not possible with all digital TV remote controls, less accessible than with analogue TV

[4] Note: visually impaired users may find changing to using any new analogue TV system a challenge too; i.e., some of the issues relating to learning to use a new system are not specific to digital, but are raised here because DSO will necessitate the use of new equipment.

	• Electronic Programme Guide use difficult (and potentially impossible) dependent on severity of visual impairment. As EPGs offer a valued means of navigating multi-channel TV for the general population, this constitutes a substantial vulnerability for visually impaired consumers. However, once channel digits are learnt for the 4 or 5 channels they receive in analogue, visually impaired consumers' access to digital versions of their current analogue services does not require an EPG
Possible benefits from DSO	• Digital TV has the capacity to offer Audio Description – a service which improves visually impaired viewers' enjoyment and understanding of TV programmes by describing scene content between sections of dialogue • Some promising research has been conducted on voice input/output EPGs (e.g., the Independent Television Commission/ Ofcom led, RTS-award winning VISTA project), offering the potential to vastly improve visually impaired viewers' access to dTV • Some visually impaired consumers have reported that it is easier to record a TV programme using a digital PVR (Personal Video Recorder), with a well laid out on screen display, than using a VCR

Prevalence in UK population	• Total blind or visually impaired people in UK: approx. 1 million (1.8% of population; European Blind Union figures, accessed August 2004, cited RNIB, 2004)
	• Legally blind: 0.5% of UK population (European Blind Union figures, accessed August 2004, cited RNIB, 2004)
	  ○ 157,000 registered blind in UK (2003, DoH)
	  ○ *not all blind people are registered blind*
	• Impaired vision: 1.5% of UK population (European Blind Union figures, accessed August 2004, cited RNIB, 2004)
	  ○ 155,000 registered partially sighted in UK (2003, DoH)
	  ○ *not all visually impaired people are registered*

Demographics	• Visual impairment more common amongst older than younger age groups
	  ○ Over 65% of registered blind people are aged 75+
	  ○ Over 75% are aged 65+
	• Commonly associated with other impairments/ disabilities
	  ○ Arthritis, heart conditions, mobility problems, diabetes
	  ○ 35% of visually impaired people have some hearing impairment (50% of visually impaired people over 75)
	  ○ especially common for 65+ year olds

Financial position	• Many visually impaired people are older, and therefore comparable financial situation to elderly people (see section 4.1.6) • Over half of visually impaired people live "at the margins of poverty" (RNIB Strategic Directions, 2000-2006) • Most visually impaired people of working age are unemployed (RNIB Strategic Directions, 2000-2006)

Impact of DSO	• High for visually impaired people who live alone, lower impact if they live with others (especially if others do not have any visual, or other, impairment)
Where do they live?	• Councils in UK have registers of Registered Blind and Visually Impaired people living in their areas • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are elderly

Suggested interventions based on current data	• Assistance may be required, especially if living alone, for:
	  ○ selection of as easy to use a STB as possible
	  ▪ with audio description
	  ▪ large button, easy to use remote control
	  ○ purchase and installation
	  ○ training, even for basic use
	• Ensure user manuals for any equipment and all DSO related communications are available in alternative formats (large print, Braille and audio)
	• Provision of an affordable installation and training service for visually impaired viewers could be useful to visually impaired consumers who live alone
	  ○ Likely to be of general use for most groups of vulnerable consumers
	• As a number of the issues raised are as a result of interaction using an additional remote control, use of an integrated digital TV (idTV) could improve accessibility and usability for visually impaired consumers. idTVs would enable access to digital versions of current services, but are not future proof (e.g., an idTV bought today is unlikely to be able to run a future talking EPG application); there is also the issue of idTVs costing more than STB conversion of existing sets
	• Many non-registered blind and visually impaired people are vulnerable (as defined in this report) and may have contact with representative organisations, such as the RNIB
	• As:
	  ○ visual impairment is vastly over-represented in older people,
	  ○ younger visually impaired people are more likely to live with others, and
	  ○ elderly people are also vulnerable in DSO in some respects (see section 4.1.7)
	  • could target elderly people (pensioners) generally, with offer of additional assistance for visually impaired people

Additional research needed?	• What is digital TV penetration in households with visually impaired people (living alone/ in family with at least one non visually impaired person) in UK?
	  ○ Data from broadcasters on usage of accessibility/ disability service? (e.g., BSkyB)
	  ○ This figure will enable a more accurate estimate of the number of visually impaired population remaining to convert to digital, enabling an estimate of the cost of targeted assistance
	• What is the financial situation of visually impaired people?
	• Advancement of technological R&D to improve visually impaired people's access to advanced functions of digital TV
	  ○ Note 1: Since 2001, ITC (and subsequently Ofcom) through the Easy TV initiative have conducted research identifying best practice in the design of easy to use domestic digital TV equipment covering on-screen display, remote control layout and labelling, set-up and installation instructions. Some of the research findings are directly relevant to visually impaired viewers' access and use of digital TV. Related work has been conducted by RNIB. The results of these studies have fed into several industry groups and have been well received
	  ○ Note 2: ITC led the Royal Television Society 2003 Technical Innovation Award winning VISTA project, that developed a PC based talking EPG to improve visually impaired people's access to digital TV. Further development of this concept to a software product for home PCs or into a speech in-out handheld device, either of which could operate with existing STBs would improve visually impaired people's access to digital TV

4.1.2 Hearing Impaired Consumers

Many people with hearing impairments rely on adequately presented visual information such as subtitles. A key access issue with reference to digital TV for consumers with hearing impairment is continued easy access to the same type of information they are able to receive via analogue. In this regard, hearing impaired consumers are required to understand a key difference between analogue and digital TV: that text services are accessed very differently. In addition to being able to access enhanced text content on digital TV using "the red button" (itself somewhat comparable to accessing text on analogue services by pressing the "text" button, or symbol), dedicated Text service channels are available on digital TV (e.g., the Teletext channel on DTT). Navigation around digital text services is usually via arrow keys, number buttons on a 0-9 menu, or using colour buttons. This is in contrast to the 3 digit page number navigation on analogue text services. The requirement to learn these new interaction techniques in order to be able to continue accessing text services post- DSO risks reducing access to TV for some hearing impaired consumers problems, especially those with other impairments or with low confidence with technology.

Ensuring that programmes are broadcast with subtitles in an easy to read font and text size, and that the subtitles are easy to access (e.g., at the press of a dedicated button rather than via a hierarchical menu structure) are therefore essential considerations in the design of digital television services accessible to hearing impaired consumers.

Definition	• Hearing impairments can range in severity from complete congenital deafness, through to hearing loss correctable to varying degrees (dependent on its severity) using a hearing aid • The Royal National Institute for Deaf People defines 4 levels of deafness (Mild, Moderate, Severe, Profound) to which hearing impaired people can be categorised depending on the volume of the quietest sound they are able to hear using their better ear (25, 40, 70, 95 dB respectively; i.e., someone who can only hear a sound of 70dB or louder in their better ear is categorised as 'severely deaf')
Why Vulnerable from DSO **(getting digital TV and basic use only)**	• For consumers with moderate, severe or profound hearing loss, communicating with a shop assistant in a busy (and noisy) retail environment to identify a STB that best matches their requirements could be problematic • Consumers with hearing impairment are regular users of text based subtitles on analogue broadcast services; **subtitles can be – but do not have to be - harder to access on digital TV** o Accessing subtitles on digital TV services requires the consumer to learn a new interaction paradigm, and can vary across different platforms and STBs (e.g., instead of pressing "text 888" as required with analogue TV, subtitles on some STBs are accessible only by navigating through the set-up/settings menu which is not always easy to find, and which some consumers may not have the confidence to access) ▪ single button access to subtitles is possible; it is already used on some digital STB remote controls, and ensures easy access to

	an aspect of TV much valued by this user group
	• A minority of hearing impaired consumers, with severe or profound deafness, tend to use sign language (British Sign Language) and tend to have reduced English literacy relative to the general population
	  ○ installation and set-up of a new DTT STB may be more difficult, e.g., if the consumer cannot easily understand installation instructions, or connections on back of TV and STB, or on-screen calls to action
	  ▪ presentation of instructions in simple step by step diagrams, in addition to text, is likely to overcome this issue
	  ○ intermittent calls to action (e.g., advising of availability of a new software download) could confuse a viewer if not understood
	• Being able to control the TV volume, essential to consumers with mild and moderate hearing impairment, is not possible with all digital STB remote controls, and is therefore less accessible than with analogue TV
	  ○ typical installation requires use of more than one remote control to be able to select channel to view (using digital STB remote control) and to control general aspects of the TV, such as volume, using the TV remote control
	  ▪ this is not an issue with integrated digital televisions (idTVs)

Possible benefits from DSO	• A possible benefit of the increased bandwidth available with digital broadcasting is its potential use for the transmission of closed caption (i.e., that user can either switch on or off) sign language to accompany a programme. This promises the benefit to consumers with hearing impairment who use sign language of being able to enjoy programming at peak time, rather than recording late night re-runs with open signing. The ITC led the (now completed) Visicast research project in this area (see http://www.visicast.co.uk/), focusing on the provision of signing via a virtual signer (a computer character animated to communicate correctly in sign language) • As per the requirements of the Communications Act (2003), Ofcom has recently released its new code on Television Access Services, detailing expanded targets for subtitling, signing and audio description of TV content • Previous research by ITC investigated the potential for presenting only a section of the full audio signal (i.e., voice/ narrative only) to improve the clarity of programme narrative for consumers with mild or moderate hearing impairments

Prevalence in UK population	• A range of approximations exist for total number of deaf or hearing impaired people in the UK.
	• The Royal National Institute for Deaf people (2003) estimates that approximately
	  ○ 700,000 people (~1.5% of adult population) are severely or profoundly deaf
	  ○ 9 million people (~20% of adult population) have some form of hearing loss, even if mild/moderate
	• Less than 200,000 people are Registered as Deaf or Hard of Hearing in England (2001, Department of Health)
	  ○ *not all people with hearing impairments are registered*
	• DTI/Generics (2004) uses ONS data to estimate that approximately 9% of the adult UK population have some form of sensory impairment (approximately 4 million people). This estimate (including visual and hearing impairments, Clarkson and Keates, 2003), is lower than the estimate of people with any hearing impairment published by RNID
	• RNID present an estimate that approximately 50,000 deaf people use BSL (British Sign Language) as their first language
	• RNID report that approximately 2 million people in the UK have hearing aids, of whom 1.4 million use them regularly

Demographics	• Hearing impairment is more common amongst older than younger age groups (statistics below are from RNID website)
	  ○ 2% of young adults are deaf or hearing impaired
	  ○ 55% of adults aged 60+ are deaf or hearing impaired
	• RNID report that hearing impairment may be more common amongst black and ethnic minority people
	  ○ Especially for recent immigrants, from poor areas with low levels of immunisation against rubella
	• Commonly associated with other impairments/ disabilities
	  ○ Physical and sensory (visual impairment)
	  ○ 45% of hearing impaired people under 60 have additional disabilities
	  ○ 77% of severely or profoundly deaf people aged over 60 have additional disability(/ies)

Financial position	• Deaf and hearing impaired people of working age are more likely to be unemployed, and to earn less ○ RNID survey (1999) showed that (of the survey respondents), ~30% of deaf people earned <£10,000/ annum compared to ~12% of the general population • Households with children are more likely to be on low incomes if there is at least one adult with any disability in the HH, than if no adults with a disability (Census 2001, ONS; online)

Impact of DSO	• Low, if mild hearing impairment and no other disability
	  ○ Biggest issue is ensuring correct purchase (and/ or usage) advice to enable consumers to select a product that supports continued easy use of subtitles
	• Higher for severely or profoundly deaf consumers
	  ○ Low English literacy can restrict a consumer's understanding of how to use digital TV, selecting best product and on-screen instructions
	• Potentially higher, if co-occurring with other disability and/or if consumer is severely/profoundly deaf and living alone

Where do they live?	• Councils in UK have registers of Registered Deaf and Hard of Hearing people living in their areas (though as noted above, only a small proportion of hearing impaired consumers are Registered) • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are elderly

Suggested interventions based on current data	• Assistance may be required, especially for hearing impaired consumers who live alone, for:
	  ○ selection of as easy to use a STB as possible
	  ▪ especially enabling easy access to subtitles
	  ○ purchase and installation
	  ○ training, even for basic use
	• Many non-registered hearing impaired people are vulnerable (as defined in this report) and may have contact with representative organisations, such as the RNID
	• As hearing impairment is vastly over-represented in older people, and as younger hearing impaired people are more likely to live with others, could target elderly people (pensioners) generally with offer of additional assistance for hearing impaired people
	• Hearing aid suppliers/ adverts could advise of DSO

Additional research needed?	• What is digital TV penetration in households with hearing impaired people split by socio-demographic elements (living alone/ in family with at least one non hearing impaired person) in UK?
	  ○ Data from broadcasters on usage of accessibility/ disability services? (e.g., BSkyB)
	  ○ This figure will enable a more accurate estimate of the hearing impaired population remaining to convert to digital, enabling an estimate of the cost of targeted assistance
	• More socio-demographic statistics on living arrangements of hearing impaired people
	  ○ How many people (of each level of hearing impairment) live alone, with family?
	  ○ Where are financially disadvantaged hearing impaired people located?

4.1.3 Dexterity Impaired Consumers

Being able to use a remote control is essential in using digital television. Because the advanced features of digital TV offer much increased functionality, most digital TV remote controls have been designed with more buttons (to manipulate this functionality) than most analogue remote controls. As reported by the Easy TV research (2002), consumers with no ability impairments complained about small, tricky to press remote control buttons and awkward to hold handsets. Obviously, it is possible for a remote control designed for use with analogue TV and video equipment to be badly designed, with small, poorly spaced buttons. However, the issue is raised here because as more functions are available with digital TV there is likely to be increased competition for space on a remote control to position buttons that quickly activate the new functions. Whilst such design shortcomings might reduce the ease with which the general population is able to use dTV, they could effectively exclude consumers with dexterity impairments from being able to use digital television, even for watching Channels 1-5.

Definition	• A consumer with an impairment in their ability to use their hands effectively to manipulate objects and articles • Such impairment can arise as a result of normal ageing, from a range of physical ailments (e.g., arthritis, Repetitive Strain Injury), from neurological diseases (e.g., Parkinson's Disease, Multiple Sclerosis), from side-effects of medication, or (acutely or chronically) from accidents

Why Vulnerable from DSO	• Difficult (or impossible, dependent on degree of impairment) to self-install a digital STB
	  ○ Difficult to unpack STB
	  ▪ Some STBs attempt to optimise this stage with easy "slip out" contents
	  ○ Connections required for self-installation can be tight (e.g., scart), requiring firm grip/insertion
	  ○ Connections can be fiddly, requiring very precise positioning
	• Remote control use difficult (or impossible, dependent on degree of impairment)
	  ○ Small buttons hard to press discretely (i.e., consumer can end up pressing two buttons at once)
	  ○ Can make it difficult to:
	  ▪ Navigate set-up menu
	  ▪ Switch power on
	  ▪ Change channel
	  ▪ Change volume
	  ▪ Use EPG, digital text and subtitles
	  ▪ Change batteries (DTI-Generics, 2004)
	• Whilst the issues above could arise in use of an analogue TV/VCR remote control, the necessity for consumers to obtain new digital equipment that they are able to use for DSO raises the pertinence of the issues

Possible benefits from DSO	• Possible advanced use services of the future offer the promise of being able to perform many functions through the TV (such as ordering a repeat medical prescription, filing tax returns) ○ If future interactive services are designed to be easy to use by dexterity impaired consumers, digital TV could be enabling to this user group • Potential voice controlled media systems of the future could reduce reliance on remote control for navigation of digital TV channels and services; this could raise the ease of use of future digital services above that of existing analogue TV

Prevalence in UK population	• DTI/Generics (2004) reported that ~15% of the UK adult population experience some form of "motion" impairment; this is a combined figure for impairments in dexterity and mobility[5]
	  ○ This is equivalent to almost 7 million adults in the UK
	• With regard to severe dexterity impairments, RNID estimate that of European adults:
	  ○ 0.1% (~50,000 in UK) cannot use their fingers
	  ○ 0.1% (~50,000 in UK) cannot use one arm
	  ○ 2.8% (~1.3 million in UK) have reduced strength
	  ○ 1.4% (~650,000 in UK) have reduced coordination

Demographics	• Dexterity impairment is much more common amongst older than younger age groups (DTI/Generics, 2004)
	  ○ Only ~5% of younger adults (aged 16-49) have any dexterity impairment
	  ○ ~47% of adults aged 75+ have a dexterity impairment
	  ○ Again, with older people the likelihood of impairments in multiple domains is higher
	• Commonly associated with other impairments/ disabilities

Financial position	• No data found/available specific to financial situation of dexterity impaired consumers • Households with children are more likely to be on low incomes if there is at least one adult with any disability in the HH, than if no adults with a disability (Census 2001, ONS; online) • Given that elderly adults are over represented in terms of adults who have any dexterity impairment, some inference is possible about the financial position of people with dexterity impairment by using pensioner financial data as a guide

[5] Note that Generics' analysis of access issues relating to digital TV grouped dexterity impairments with mobility impairments, in their estimates of prevalence in the population and difficulties across the adoption and use process. For the purposes of this report, no specific (separate) reference is made to consumers with mobility impairment. This is because consumers with mobility impairments that substantially detract from their ability to, for example, go to a shop to select a digital STB are vulnerable in several regards in day to day life and are likely to require care/assistance in other domains (i.e., they are unlikely to be facing the prospect of converting to digital TV alone).

Impact of DSO	• High for set up and installation
	• Variable for basic use of digital TV using a remote control
	  ○ Impact can be reduced through recommending use of a remote control with larger, better spaced buttons, made of an easy to grip (rubbery) material
	  ▪ idTVs are the most transparent solution – making digital as comparable to analogue as possible

Where do they live?	• Councils in UK have registers of Disabled people living in their areas (though as noted above for Registers of visually and hearing impaired consumers, only a small proportion of consumers with a dexterity impairment are likely to be Registered) • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are elderly

Suggested interventions based on current data	• Targeted assistance likely to be required, especially for dexterity impaired consumers who live alone, for:
	  ○ selection of as easy to use a STB as possible
	  ▪ with a remote control with larger, better spaced buttons, made of an easy to grip (rubbery) material
	  ○ purchase and installation
	  ○ training, even for basic use
	• Many dexterity impaired people are vulnerable (as defined in this report) and may have contact with representative organisations for diseases that underlie their dexterity impairment (e.g., Parkinson's Disease Society)
	• As dexterity impairment is vastly over-represented in older people, and as younger dexterity impaired people are more likely to live with others, could target elderly people (pensioners) generally with offer of additional assistance for dexterity impaired people
	• Contact through GPs about DSO may be possible

Additional research needed?	• What is digital TV penetration in households with dexterity impairment split by socio-demographic elements (living alone/ in family with at least one non dexterity impaired person) in UK?
	  ○ Data from broadcasters on usage of accessibility/ disability services? (e.g., BSkyB)
	  ○ This figure will enable a more accurate estimate of the dexterity impaired population remaining to convert to digital, enabling an estimate of the cost of targeted assistance
	• More socio-demographic statistics on living arrangements of dexterity impaired people
	  ○ How many people live alone, with family
	  ○ Where are financially disadvantaged dexterity impaired people located?

4.1.4 Cognitively Impaired Consumers

Consumers with cognitive impairment can face several challenges in accessing digital TV. Whilst issues such as understanding what digital is, what it can offer to them as consumers, and being able to afford digital are all important issues, perhaps the biggest issue that cognitively impaired consumers are required to deal with is the increased complexity of interaction with digital TV relative to analogue TV. This complexity covers many issues, from the requirement to select what to watch from an increased choice available, to understanding and remembering that there is a requirement to enter a 3 digit number to select a channel. As consumers with the most severe cognitive impairments are unlikely to live alone, any impact of DSO on them is likely to be reduced through assistance they receive from family/ primary caregiver.

Definition	• Cognitive impairment can vary in severity, from mild to severe, resulting in a range of limitations • Cognitively impaired consumers are likely to have difficulty(/-ies) arising from a reduced ability to concentrate, understand, reason, learn or remember various features of the interaction paradigms required to interact with digital TV that they did not need to know in order to be able to use analogue TV • Such impairment could be as a result of reduced intellectual function arising from the ageing process, congenital learning disabilities, brain injury (arising from stroke, trauma, disease), learning impairment, language impairment, dementia (e.g., Alzheimer's), and substance abuse (both on an acute and chronic timescale)

Why Vulnerable from DSO	• Dependent on degree of impairment, cognitively impaired consumers could be vulnerable to DSO in several ways:
	  ○ in terms of understanding what digital TV is,
	  ○ being required to learn to operate and interact with new equipment, and
	  ○ learning to operate more complex equipment than they need to with analogue TV
	• Less likely to be aware of the existence of digital TV and how to get it, especially severely cognitively impaired consumers
	• Cognitive impairment may reduce salience of public communications initiatives, effectively reducing exposure to advertising and sales communications
	• Less likely to be able to afford conversion costs
	• Will require assistance in selecting an appropriate STB (with an easy to use control interface and remote control), and to connect it to existing equipment and set it up
	• Added complexity caused by need for 2 remote controls means even simple tasks, such as switching TV on, changing channels, and volume control could be inaccessible if digital TV is accessed using existing TV plus a digital STB (especially to severely cognitively impaired consumers)
	• Electronic Programme Guide use likely to be problematic for cognitively impaired consumers

Possible benefits from DSO	• None identified ○ Some of the same potential benefits as for the general population

Prevalence in UK population	• DTI/Generics (2004) reported that ~5.7% of the UK adult population experience some form of impairment in their Cognitive abilities
	  ○ This is equivalent to approximately 2.5 million adults in the UK
	• With regard to cognitive impairments, RNID estimate that of European adults:
	  ○ 0.25% (~115,000 in UK) have a speech impairment
	  ○ 0.6% (~275,000 in UK) have a language impairment
	  ○ 1% (~450,000 in UK) are dyslexic
	  ○ 3% (~1.4 million in UK) are intellectually impaired

Demographics	• Cognitive impairment is, again, much more prevalent amongst older than younger age groups (DTI/Generics, 2004)
	  ○ Only ~3% of younger adults (aged 16-49) have a cognitive impairment
	  ○ ~15% of adults aged 75+ have a cognitive impairment
	  ○ Again, with older people the likelihood of impairments in multiple domains is higher
	• Alzheimer's Society estimates that there are around 750,000 people in the UK with dementia, of whom only 18,000 (estimated) are under 65
	  ○ Large increase in dementia over 80 years of age
	• Commonly associated with other age-related impairments/ disabilities

Financial position	• Consumers with severe cognitive impairment are less likely to be in well paid employment than consumers without cognitive impairment (ODPM, 2004) • Given that elderly adults are over represented in terms of cognitive impairment, some inference is possible about the financial position of people with cognitive impairment by using pensioner financial data as a guide
Impact of DSO	• High - across the full purchase and use process, though dependent on nature and severity of impairment ○ Less likely that people with severe cognitive impairment, on whom the impact of DSO is likely to be highest, live alone – so those most vulnerable are likely to be assisted by family/ care-giver

Where do they live?	• Councils in UK have registers of Disabled people living in their areas (though as noted above for Registers of visually and hearing impaired consumers, it is possible that only a small proportion of consumers with a cognitive impairment are Registered) • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are elderly

Suggested interventions based on current data	• Targeted assistance very likely to be required, especially for cognitively impaired consumers who live alone, for:
	  ○ selection of as easy to use a STB as possible
	  ○ purchase and installation
	  ○ training, even for basic use to a level of comparable ability to operate as achieved with analogue TV
	• Social services and primary medical care facilities are likely to have fairly regular contact with consumers with all but the mildest cognitive impairment
	• Assistance could be targeted via carers of cognitively impaired consumers
	• Many cognitively impaired people are vulnerable (as defined in this report) and may have contact with representative organisations that provide support in dealing with their impairment (e.g., Alzheimer's Society)
	• As cognitive impairment is vastly over-represented in older people, and as younger cognitively impaired people are more likely to live with others, could target elderly people (pensioners) generally with offer of additional assistance for cognitively impaired people
	• Contact through GPs about DSO may be possible
	• Targeted assistance via (social service/ non social service) carers of cognitively impaired consumers

Additional research needed?	• More socio-demographic statistics on living arrangements of cognitively impaired people
	  ○ How many people live alone, with family?
	  ○ Where are financially disadvantaged cognitively impaired people located?
	• What is digital TV penetration in households with cognitive impairment split by socio-demographic elements (living alone/ in family with at least one non dexterity impaired person) in UK?
	  ○ This figure will enable a more accurate estimate of the cognitively impaired population remaining to convert to digital, enabling an estimate of the cost of targeted assistance

4.1.5 Financially Disadvantaged Consumers

The switch to digital TV for any non-digital household inevitably incurs some cost. For many households, the cost will be as little as £50 per TV (or Video Recorder, VCR) to be converted. In other situations, households' old aerial installations will not meet the requirements to support reception of a DTT signal; these households may require a new roof aerial, or a set-top aerial to enable them to receive DTT. The following elements could incur cost:

(i) Set-Top Box for each TV and VCR to be converted: price range £50-200 [note that the top end of the range is for a twin tuner Personal Video Recorder that would convert both a TV and VCR to digital TV]

(ii) Aerial Upgrade: predicted to be required by around 30% of households, an upgrade to an aerial suitable to receive DTT is likely to cost in the region of £80-300 (source: Ofcom: DSO report, page 61)

- Additional expenditure may be necessary by households in poorer coverage areas who currently use a TV with a portable indoor aerial. Some of these households may require the installation of a roof or loft aerial and additional aerial outlets for sets previously served by set-top aerials

(iii) Whilst cables and connectors (scart, RF) for the simplest installation are sometimes included with a STB, additional cables may be required to connect the STB to other home entertainment devices. Additional scart leads cost in the region of £10-15 each, RF cables in the region of £5.

Definition	• Consumers who cannot <u>afford</u> the cost for conversion of their main (analogue) TV set to digital TV[6]
	  ○ Perceptions of what is affordable do not vary only by financial resource within a household, but also by the value they attach to TV. Some households with a low disposable income will value TV enough to be sufficiently motivated to convert to digital TV even if it costs a large proportion of their disposable income. Equally, some higher income households cite cost as a reason not to get digital TV
	• The income poverty line is usually cited as being 60% of median household income after housing costs (source: Child Poverty Action Group, online; citing Households Below Average Income statistics & Poverty and Social Exclusion Survey in Great Britain, 1999)
	• For illustrative purposes, the income poverty line in 2002/03 for the following groups (per week) is as follows:
	  ○ Single person: £94
	  ○ Lone parent with child aged 3: £126
	  ○ Lone parent with 2 children (aged 3 and 8): £165
	  ○ Lone parent with 2 children (aged 5 and 11): £175
	  ○ Couple: £172
	  ○ Couple with child aged 3: £203
	  ○ Couple with 2 children (aged 3 and 8): £243
	  ○ Couple with 2 children (aged 5 and 11): £253
	  ○ Couple with 3 children (aged, 3, 8 and 11): £287
	(source: Child Poverty Action Group, as above)

[6] Note: in considering only main set conversion as a pre-requisite for DSO, there is a risk of substantially inconveniencing the general population; given that the average UK household has 2 TVs, plus a VCR. Conversion to all digital would incur higher costs than just main set conversion.

Why Vulnerable from DSO	• Consumers in households that cannot afford to convert their main TV sets to digital TV would lose access to any TV services at DSO • Generics/ DTI data shows that lowest household income households (<£5.4k/annum) are those most likely to say they will "never" adopt digital TV
Possible benefits from DSO	• Same as for general population; access to enhanced entertainment and information services
Prevalence in UK population	• There are four main groups of financially disadvantaged consumer: o Single parent families o Low income families with two or more adults o Households with at least one adult with disabilities o Pensioners, especially older pensioners (75 years +)
Demographics	• Majority social grades D and E
Financial position	• This group is identified as vulnerable because of their low income
Impact of DSO	• High – without targeted assistance, financially disadvantaged consumers would have to spend a very large proportion of their income or lose access to TV • Higher still for owner occupying financially disadvantaged consumers – if they need a new aerial the cost will be their responsibility, upfront • Financially disadvantaged consumers who live in multiple dwelling units will be dependent on their landlord (private or council) to ensure adequate aerial provision
Where do they live?	• Almost all consumers vulnerable as a result of their financial situation will be accessible via Benefits offices and/or Council and Local Authority Registers[7] • Higher prevalence of financially disadvantaged consumers live in inner city (urban) areas, and in rural areas • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are financially disadvantaged
Suggested interventions based on current data	• Targeted assistance for main set conversion for financially disadvantaged consumers who meet eligibility criteria[8]

[7] A minority of financially disadvantaged consumers may not be registered for benefits, and will therefore be difficult to reach.
[8] Defining eligibility criteria is a key task in planning for DSO.

Additional research needed?	• Support for future technology research: For this group of vulnerable consumers there may be a market for a small low-cost device that literally sits between the TV and aerial and provides as transparent a conversion to digital as possible

4.1.6 Elderly Consumers

The UK has an ageing population and disability tends to increase with age. With age, multiple disabilities become more common. In fact, vulnerability is much more common for elderly consumers across the full range of domains considered in this report, including their visual, auditory, dexterity, and cognitive abilities, financially, and in terms of their geographic location. Further, having not 'grown up' with technology, many elderly people feel left behind and are less likely to feel at ease with the idea of using digital television.

Definition	• Elderly consumers are defined here as being aged 65 years and upwards[9]

Why Vulnerable from DSO	• **Not all elderly consumers are vulnerable**
	  ○ *a large proportion of the UK's disposable wealth is owned by elderly consumers (see Financial Position, below)*
	• However, there is a much higher chance of elderly consumers having limitations across one or more of the full range of domains considered in this report, including: sensory, cognitive or physical impairment, financial disadvantage, and rural location
	  ○ 1% of adults over the age of 65 have Parkinson's Disease, 8% Alzheimer's
	  ○ 48% of the disabled population is aged 65 years or over, 29% aged 75 years or over (compared to 21% and 9% of the population respectively)
	  ▪ 65% of registered blind people are aged 75+, over 75% are aged over 65
	  ▪ multiple disabilities more common for elderly consumers:
	  • e.g., 50% of visually impaired people over the age of 75 also have some hearing impairment
	  ▪ 55% of adults aged over 60 are deaf or hearing impaired
	  • 77% of severely or profoundly deaf people over the age of 60 have additional disabilities

[9] Whilst previous research showing age related trends in attitudes towards, and penetration of, digital TV has grouped 55-64 year olds with elderly consumers, 65 years of age and above has been selected as the cut-off in this report because several of the statistics reported to this point have shown a higher prevalence of impairment at 65 years and above and, further, this group is easily targetable through the pension and benefits system

Why Vulnerable from DSO (cont.)	• A key difference between elderly consumers with any impairment and younger consumers is that, generally, elderly consumers tend to hold an apathetic attitude towards digital TV, and are more likely to be concerned about ease of use issues with relation to using new technologies
	  ○ This is an important consideration because, whilst consumers with the motivation to learn and use digital TV may be prepared to overcome any usability and access hurdles they face, without sufficient motivation to overcome them the issues might constitute barriers
	  ○ That said, retired elderly consumers tend to watch more TV than the general population, suggesting that they would be motivated to act to switch to digital (if able to) rather than face the prospect of losing access to TV

Possible benefits from DSO	• The same potential benefits as for the general population, accentuated for subgroups with specific impairments/ vulnerabilities (described previously) ○ e.g., audio description improving visually impaired and blind people's enjoyment of TV programmes
Prevalence in UK population	• 16% of the UK adult population are aged 65+ (2002 estimate; source: Office for National Statistics, General Register Office for Scotland, Northern Ireland Statistic and Research Agency) ○ For the first time, there are more people aged 60 years or higher than there are children
Demographics	• Vulnerable elderly consumers with a range of impairments can be from all socio-economic grades ○ Those most likely to be vulnerable to DSO on the basis of financial disadvantage will be from social grades D and E
Financial position	• Varied, some elderly consumers very wealthy • The most vulnerable elderly consumers are financially disadvantaged ○ Elderly consumers with impairments are more likely to be poor

Impact of DSO	• Variable, dependent on:
	  ○ Physical, cognitive, sensory impairments
	  ○ Financial position
	  ○ Motivation to watch TV
	• Elderly consumers with impairments are likely to constitute the majority of consumers likely to require assistance with DSO

Where do they live?	• The highest concentration of elderly consumers is in Wales, Cornwall and around the coast of the UK, and away from the main population centres • For vulnerable elderly consumers with impairments, councils in UK will have registers of Disabled people living in their areas (though as noted above, it is possible that only a small proportion of vulnerable elderly consumers are Registered) • Census data from ONS, and targeted marketing databases will enable identification of postcodes (and areas) where substantial proportions of the local population are elderly (and poor)
Suggested interventions based on current data	• Targeted assistance very likely to be required for vulnerable elderly consumers who live alone, for: o selection of as easy to use a STB as possible o purchase and installation o training, even for basic use to a level of comparable ability to operate as achieved with analogue TV • Targeted assistance very likely to be required for vulnerable elderly consumers who live alone • Vulnerable elderly consumers contactable through benefits and pensions offices, and tax office • Social services, primary medical care facilities, and benefits offices are likely to have contact with vulnerable elderly consumers • Contact through GPs about DSO may be possible, arranged to coincide with, for example, flu vaccinations • Assistance could be targeted via carers of vulnerable elderly consumers
Additional research needed?	• Track digital TV penetration in households with elderly consumers split by socio-demographic elements (living alone/ in family with at least one person without impairment) in UK?

4.1.7 Consumers With Low English Literacy

This group is included here because reduced literacy can lead to a consumer being vulnerable in day to day life, reducing their access to services and information. In reality, consumers with low English literacy and no other impairments are unlikely to have specific difficulties in obtaining access to a digital TV signal arising from their low literacy. However, as for our other vulnerable groups, low English literacy is related to lower income and, if elderly too, to physical, sensory or cognitive impairments. In the context of multiple impairments, or co-occurring vulnerabilities, the impact of low literacy is likely to have a higher impact than it would on its own. Further, evidence from the Office of the Deputy Prime Minister (2004) indicates that Bangladeshi and Pakistani households, where it is likely that some consumers live whose first language is not English, are three times more likely to be on a low income than other households.

Definition	• Consumers with poor English reading and writing skills
Why Vulnerable from DSO	• This group of vulnerable consumers may have difficulty understanding (written) DSO related communications • May also have difficulty understanding product offers, installation, connection and set-up instructions communicated in English
Possible benefits from DSO	• Same as for general population • On some digital TV platforms specific channels and services are targeted at some ethnic minority groups
Prevalence in UK population	• Department of Further Education figures suggest that approximately 5% of the adult population have literacy skills below what is expected of 11 year olds entering secondary education (Source: National Needs and Impact Survey of Literacy, Numeracy and ICT Skills, DfES, October 2003) • It is not suggested here that all consumers who were classified as having low literacy by DfES figures are vulnerable in DSO • Poor literacy is more common amongst consumers whose first Language is not English • Some consumers for whom English is a second language have no literacy problems at all (in fact score very well on literacy)
Demographics	• Lower level literacy skills are associated with socio-economic deprivation o "adults in more deprived areas, such as the North East, tended to perform less well in [literacy] tests than those in less deprived areas such as the South East" (source: National Literacy Trust, online) o More than a third of adults living in lowest social class households were classified as having lower literacy skills, whereas adults living in highest social class households were roughly four times more likely to score highly in literacy tests

Financial position	• Good literacy and numeracy skills tend to be associated with good wages, although the connection is stronger for numeracy • Pakistani and Bangladeshi households are 3 times more likely than the general population to have low incomes
Impact of DSO	• Low, if solely literacy is impaired (relative to general population) • Higher if financially disadvantaged and/ or impairments in other domains
Suggested interventions based on current data	• Provision of step by step diagrams in installation and set-up instructions • DSO related communications could be made available in a range of languages • Recommendation for a STB that is easy to install and set-up, with an instruction manual that uses simple language and diagrams • Contact about DSO through representative religious and/or cultural groups
Additional research needed?	• Track digital TV penetration in households with consumers with low English literacy (including ethnic split), split by socio-demographic elements (living alone/ with children) in UK? o On some digital TV platforms specific channels and services are targeted at some ethnic minority groups ▪ Data on subscription to these channels

4.1.8 Rurally Located Consumers

Key issues with regard to access to a digital facsimile of analogue services for rurally located consumers include whether their home is predicted to be within an area that will receive a digital TV signal at DSO, and because elderly consumers are more likely to live in rural areas the same set of issues that face elderly consumers generally.

Definition	• Consumers who live in less populated areas of the UK [this is the Government's new definition of rural, and is available online here: http://www.defra.gov.uk/rural/strategy/annex_b.htm]
	  ○ Rural area: less densely populated settlement area with less than 10,000 people
	  ○ Urban area: settlement area with more than 10,000 people

Why Vulnerable from DSO	• Higher chance of poor/ no coverage via DTT pre-SO, and possible coverage problems post DSO ○ If no DTT coverage, satellite may be only means of obtaining a TV signal at DSO
Possible benefits from DSO	• None that are specific to this user group ○ Same potential benefits as for the general population
Prevalence in UK population	• Current predictions indicate that a very small proportion of the UK population may remain un-served by a DTT signal post DSO, though coverage in rural areas is likely to compare favourably with the coverage of current analogue TV signals (source: Ofcom) • Approximately 20% of the UK population live in locations that are classified (by the ONS) as Rural (source: Census 2001) • The vast majority of the rural population will be served by a DTT signal at DSO (source: Ofcom)

Demographics	• The UK rural population comprises both more older and less younger consumers than the UK urban population
	  ○ 18% of people in rural areas are 65 or over, compared with 15% in urban areas. The percentage of people over 65 is highest in sparsely populated rural areas (22%);
	  ○ 46% of people in rural areas are 45 or over, compared with 38% in urban areas. Again, the percentage is highest in sparsely populated rural areas (51%);
	  ○ there are nearly three quarters of a million people aged over 50 living alone in rural areas, of which over 300,000 are 75 or over. Of these, 25,000 are in sparsely populated rural areas;
	  ○ 40% of people aged 75 or over in rural areas live alone; and
	  ○ 11% of people in rural areas are aged between 18 and 29, compared with 16% in urban areas.
	  source: http://www.defra.gov.uk/rural/strategy/annex_b.htm

Financial position	• "Majority of rural areas are relatively prosperous" (Defra, 2004; http://www.defra.gov.uk/rural/strategy/chapter1.htm)
	  ○ e.g., with regard to average income, 55% of households in rural areas are above the median, and 28% are in the top quartile
	• Minority of rural areas are poor; "poorest performing rural areas are on a par with the weakest urban areas" (Defra, 2004; http://www.defra.gov.uk/rural/strategy/chapter1.htm)
	  ○ the bottom quartile of rural districts contain 22% of the population, yet they include 36% of rural people in the bottom 25% on the Index of Multiple Deprivation (IMD) and 48% of rural people in the bottom half on the IMD

Impact of DSO	• Consumers who will not be served by a DTT signal post DSO will need to obtain a TV signal via satellite to continue receiving TV; at present this has a cost implication higher than conversion to digital via DTT
Suggested interventions based on current data	• Development of subscription free digital TV on satellite • See suggestions for impairments in other domains, especially elderly specific
Additional research needed?	• How does health/ disability of rurally located elderly consumers compare to that of elderly consumers in urban areas?

4.2 Prioritisation Of Issues Across All Vulnerable Groups

4.2.1 Overview

In this section a prioritised list of issues facing the vulnerable groups discussed in this report is presented. In prioritising the issues, consideration has been taken of where the step is in the adoption and use process of digital TV, of the impact that each impairment is likely to have on adoption and use, and of the prevalence of the impairments discussed in this report (and their co-occurrence).

A new, detailed cross-tabulation of age by (multiple) impairment(s) by financial situation by location split by existing digital TV penetration is outside the scope of the current report and available data. Generics (2003, 2004) recently produced two comprehensive reports; one on usability and accessibility issues relating to digital TV, the other on the influence of DSO on attitudes to digital TV. Many of the findings of the Easy TV (2001, 2002, 2003) and Go Digital (2003) research projects with respect to the usability and adoption of digital TV were supported by Generics' research results. The scope of the Generics study was however broader, with a substantial focus on the effects of DSO (or an announcement of a date for DSO) on consumers' plans to adopt digital TV. Most usefully for the purposes of the current report, within the Generics report is the most recent estimation of the impact of physical, sensory and cognitive impairments on the accessibility of digital TV. Data from the Generics report has been cited throughout this report with reference to each discrete impairment that could cause a consumer to be considered vulnerable.

Generics (2003) report, on the basis of a detailed exclusion analysis with the most current data available, that with today's equipment "an additional 2 million people (4.4.% of those able to access analogue television) could be excluded from simply viewing the new digital services using digital terrestrial television set top boxes at switchover," and further that "about 15% of viewers who wanted digital terrestrial television would need technical assistance" in the installation and set-up steps. It is important that in reviewing these estimates in preparation for detailed DSO planning and implementation, account is taken of how many of these consumers have family and/ or social support networks capable of assisting them with the switch. In addition, further technical and design improvements to current conversion solutions are possible prior to DSO. This report concludes with a suggestion for further data aggregation/collation to inform switchover planning and implementation, and for the development of a transparent digital converter that literally allows users a digital version of their current analogue services.

The following section provides a summary indication of the steps in the adoption and use process that constitute issues for vulnerable consumers. As per the scope of this report, basic use only is considered – use that would enable vulnerable consumers to access a digital facsimile of the analogue TV services they currently access[10].

[10] This is as required by the terms of reference for this report. Note however that additional accessibility initiatives may be required of service and equipment providers under Disability and Discrimination law.

4.2.2 Summary: assisting Vulnerable Consumers in the adoption and use of digital TV

A summary is presented here of issues raised in the main body of the report with relation to each group of vulnerable consumer, and possible means of assisting vulnerable consumers with regard to these issues in order to minimise the negative and maximise the positive potential of DSO for vulnerable consumers.

Availability and selection of appropriate digital equipment

- Easy to use
    - Integrated digital TV easiest to use
        - most comparable to analogue, higher cost implications
    - Communications initiatives could encourage all consumers to only buy digital equipment, or at least make clear that new analogue equipment requires conversion to still work post DSO, and that once converted its use will require two remote controls
- Solutions that match user needs, as detailed in section 4.1, e.g.,
    - Easily accessible subtitles for Hearing Impaired Consumers
    - Supporting the provision of Audio Description for Visually Impaired Consumers
    - Providing comparable accessibility to Elderly consumers as analogue TV does (ideally a transparent change)
        - There is currently no (STB) conversion device that provides (literally) a digital version of current analogue services in a way that is transparent to the consumer

Purchase of appropriate equipment to switch to digital

- Targeted assistance with cost of purchase and installation of new equipment, based on affordability criteria
    - In defining eligibility for targeted financial assistance, consideration should be taken of any additional vulnerability that consumers may face if they experience co-incidence of impairments

Installation and set up of new digital equipment

- Development of an affordable and reliable service to install appropriately selected DTT set top boxes (and aerial if required) in homes of vulnerable consumers who live alone, or who lack a social network capable of providing assistance

Training in basic use of new digital equipment

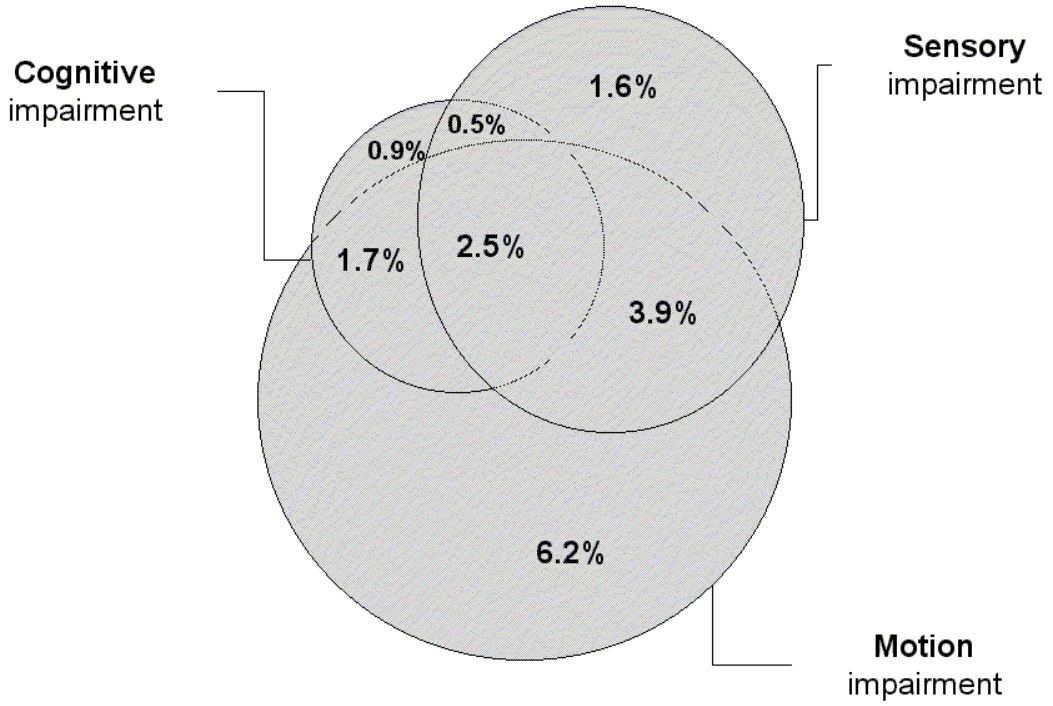
- Development of an affordable and reliable training programme to teach vulnerable consumers first how to use digital TV equipment to allow them to access a similar level of service to that which they can currently access via analogue TV and, for consumers with the motivation to learn, how to use more advanced digital and interactive TV functions and services
- A similar scheme has been launched within Europe for training elderly consumers in personal computer use. It is called SeniorNet, and the reader is referred to this web address for a detailed description (http://www.seniornet.se/contents/printwindow.jsp?cikkid=424) (http://www.seniornet.se/browse.jsp?id=01_03&cikkid=424)

- It is likely that such a training programme could cover the following steps in basic use of digital TV:
    - Switching TV and STB on
    - Changing channels
    - Changing volume
    - Using Electronic Programme Guide
    - Use of Subtitles
    - Use of Digital Text

4.3 Research requirement in planning for DSO

Generics' (2003) report is the most current estimate of the numbers of consumers with a range of impairments and the impact of their impairments on their ability to adopt and use digital TV. The estimates reported by Generics were prepared in collaboration with Clarkson and Keates (2003). To give the reader an indication of the extent to which different impairments co-occur in the population, Figure 2 is a Venn diagram illustration of the prevalence of motion (dexterity and mobility), sensory (visual, auditory, tactile) and cognitive impairment in UK adults, reproduced from Clarkson and Keates (2003).

Figure 2: Venn diagram, showing prevalence in UK adults (16+) of different types of impairments, and their co-occurrence



(reproduced from Clarkson and Keates, 2003)

As evident from this review, substantial, good quality and relatively recent bodies of data already exist relating to the characteristics of vulnerable consumers in switchover. However, in order to plan in detail for DSO and to accurately gauge how many consumers may require targeted assistance (financial or otherwise) for switchover, this review has suggested a need for an in depth, cross tabulation of a more comprehensive data set covering all potentially relevant issues. For example, in relation to Figure 2, whilst data exists on the prevalence of, say, visual impairment, in order to estimate how many consumers with a visual impairment will need targeted assistance it is necessary to know what proportion of visually impaired consumers live alone and lack any form of social support network, i.e. are very likely to need some form of external assistance in order to be able to continue to receive TV services post DSO.

In planning for DSO, to estimate the numbers of vulnerable consumers who without any assistance would potentially lose access to TV services and to identify them in sufficient detail to enable the implementation of targeted initiatives, a data set is required that provides accurate population estimates (and detailed location data) for the following:

- Characteristics of Impairments:
  - Type(s) (e.g., visual, hearing, dexterity)
  - Severity (e.g., mild, severe)

- Socio-demographic characteristics:
  - Age
  - Social grade
  - Ethnicity
  - Location (e.g., urban, rural)

- Household characteristics:
  - Household income
  - Benefit and social service support entitlement and take-up
  - How many people resident in household
  - Children in household
  - Status of Chief Income earner, Key Decision Maker
  - Availability of a social/ support network

- Current media use:
  - Already adopted digital TV
    - for at least one TV in house
    - whole house conversion
  - Platform (DTT, Cable, Satellite)
  - Other media penetration
    - Internet
    - Broadband
  - Attitudes to media consumption

4.4 Additional technology research to increase accessibility of digital TV

Research and Development to improve accessibility of digital TV
As discussed in relation to the specific impairments reviewed in section 4.1 of this report, in order to maximise the positive potential of DSO to improve access to TV services, there is a good case for the continued support and expansion of research and development activities in relation to the provision of:

- Speech input and output interfaces for navigating digital services
- Design guidelines for optimising general ease of use and accessibility of digital TV products and services

A truly transparent digital adapter
Finally, in considering in depth the issue of reception of a digital facsimile of current analogue TV services by vulnerable consumers, it is apparent that there is a need for a device that can provide such a service. At present DTT STBs provide an expanded channel line up to the 5 channels that analogue TV offers. Increased complexity of navigation and interaction for vulnerable consumers is one consequence of this increase. This complexity is further increased by the necessity for most STB based solutions to use two remote controls. A digital TV receiver device that would sit between the aerial input and the TV and that could be operated by the (legacy) analogue TV remote control, would be the most transparent, usable and accessible means of enabling vulnerable consumers to continue to watch channels 1-5 in an all digital broadcast environment[11].

[11] For example, on installation a new STB would need to learn the remote control codes emitted by the analogue remote. These codes (e.g., the code for button "1") could, through software, be associated with their digital equivalents (e.g., BBC1, or say, channel 101 on digital). If all current terrestrial channels were tuned to the output of the STB, a user could use their analogue remote control to flick through channels 1-5, and - although in reality watching digital versions of them - feel as though they are watching their analogue services.

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The starting point for statistics presented in this report is data presented by The Generics Group for DTI on Usability and Accessible Design for Digital Switchover, which are in turn based on the (1996/7) Disability Follow-Up to the Family Resources Survey. However, in preparation for this document a large selection of literature was studied. References to the literature and other resources identified are listed below.

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(The Disability Rights Commission have a downloadable article about Inclusive Design with lots of examples of good design features and references. Pdf downloadable from:)
http://www.drc-gb.org/drc/InformationAndLegislation/Page313.asp

Audit Commission:
http://www.audit-commission.gov.uk/index.asp
(May hold some potentially useful information to inform future publicity statements)

Employers Forum on Disability:
http://www.employers-forum.co.uk/www/index.htm
(Also see particularly the Broadcasters' Disability Network:)http://www.employers-forum.co.uk/www/guests/bdn/broadnet.htm

Foundation for Assistive Technology:
http://www.fastuk.org
(has a database of articles, including universal design and accessibility)

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(An organisation for people who are deafblind or have associated disabilities.)

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