

Understanding digital engagement in later life

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Summary

How does use of the internet vary among older people?

- For the English population aged 50 and over, large differences exist in the frequency of internet use by each of gender, age, wealth and region of England.
- The percentage of people using the internet frequently (at least once a week) shows a strong decrease with age. Over 90 per cent of men aged 50 to 54 use the internet frequently, but by age 80 only just over a third of men are frequent internet users.
- The proportion of women using the internet is lower. At age 50-54 81 per cent use the internet frequently and by age 80 this is the case for fewer than 14 per cent of women.
- The prevalence of frequent internet use drops to below half by age 75 for men and by age 70 for women.
- Over the ten year period of 2002/3 to 2012/13 there is an overall increase in frequent internet use for those aged 50 and over. However, frequent internet use increased at a greater rate for those who were younger than for those who were older, meaning that the gap in internet use between earlier and more recent age cohorts increased over time. Additionally, among older age cohorts (those aged 75 or older when first interviewed) the initial increase in internet use becomes a decline towards the end of the study period. These patterns are present for both men and women.
- The rate of internet use at a particular age is lower for earlier age cohorts than for more recent age cohorts. For example, at an average age of just below 72 the earliest cohort (aged 70-74) had a rate of frequent internet use of about 18 per cent, compared with a rate of about 33 per cent for the next cohort (aged 65 to 69 when first interviewed) and a rate of almost 50 per cent for the cohort that followed that (aged 60 to 64 when first interviewed).
- For the population overall, the richest fifth of the population (highest wealth quintile) were more likely to use the internet frequently, 87 per cent of men and 80 per cent of women used the internet frequently, compared with only half of men and two-fifths of women in the poorest fifth of the population.
- Frequently use of the internet is less common among those in lower wealth quintiles regardless of age group. For example, in the 75 to 79 age group less than a fifth of people in the poorest fifth frequently access the internet, compared with over half of people in the wealthiest fifth. These associations suggest that differences in internet behaviour occur not only as the result of age, but also as a result of social position.
- The North East of England has the lowest proportion of both men and women who use the internet daily (46 per cent of men and 38 per cent of women) and the highest proportion who never use the internet (34 per cent and 43 per cent, respectively). The highest rates of internet use are found in the East of England, London, the South East of England and the South West of England (each region over 60 per cent of men and over 50 per cent of women using the internet daily).

- As population density decreases there are increasing rates of both men and women using the internet frequently. This means that men and women in more rural locations are more likely to use the internet than men and women in cities.
- There is a strong relationship between internet use and indicators of area deprivation for those aged 50 and over. Just over half of men in the most deprived areas use the internet frequently, compared with over four-fifths of men in the least deprived areas. And less than half of women in the most deprived areas use the internet frequently, compared with around 70 per cent of women in the least deprived areas.

Where do older people use the internet and which devices do they use?

- Among those who use the internet almost everyone (regardless of frequency of use, age, gender and wealth) uses the internet at home. The next most frequent place of use is work, followed by using the internet while on the move and while at other people's houses. Very few people use the internet in educational establishments (a little over 3 per cent of both men and women with little variation by age or wealth).
- Notably higher proportions of men than women access the internet on the move (27 per cent of men in total compared with 19 per cent of women). The use of internet on the move is also more common among wealthier quintiles: the percentage of women accessing the internet on the move is over twice as high in the wealthiest fifth compared with the poorest fifth of the population. There is also a large drop with increasing age in accessing the internet on the move for both men and women.
- Internet use at work is consistently higher among those in wealthier quintiles for both men and women. And, as would be expected, the proportion of people accessing the internet from places of work falls rapidly as age increases, reflecting workforce exit.
- Desktop computers are used to access the internet by 70 per cent of male and 60 per cent of female internet users aged 50 or older, and laptop computers are used at similar rates to the use of desktop computers (67 per cent of male and 68 per cent of female internet users).
- The use of other devices to access the internet is much less common, with only 30 per cent of men and 20 per cent of women in this age group using smartphones and only 16 per cent of men and 14 per cent of women using tablets.
- The use of laptops falls at a faster rate with age than the use of desktop computers for both men and women. By age 80 and over, the use of desktop computers for internet access is 8 per cent lower for men and 9 per cent lower for women than at age 50-54, while for laptops it is 23 per cent and 33 per cent lower for men and women respectively.
- Similarly, the use of tablet computers by age 80 is half the rate at age 50-54 among men, and almost two thirds lower among women. There is also a sharp decline with age in the proportions of men and women using smartphones for internet access. Almost half of all men aged 50-54 use smartphones to access the internet, but by age 70-74 this figure is less than 10 per cent and continues to decline thereafter. Over a third of women use smartphones at age 50-54, but only 5 per cent do so at age 70-74 and as for men, the proportion continues to decline thereafter.

What do older people use the internet for and does internet use compensate for lack of physical access to services?

- Among those aged 50 and older the use of the internet is particularly common for activities such as: sending/receiving email, finding information about goods or services, searching for information for learning or research, shopping or buying goods and services, news or newspaper websites, and streaming or downloading live or on demand TV or radio. Sixty-five per cent of men and 54 per cent of women use the internet for one or more of these purposes.
- Men are generally more likely than women to use the internet for financial purposes across all ages – 38 per cent of men compared with 27 per cent of women aged 50 and older use the internet for this purpose.
- For both men and women, the percentage reporting using the internet for finances lessens with age. Just over half of men aged 50-54 use the internet to deal with finances, compared with 13 per cent of men aged 80 and over.
- Network and gaming activities is the only category of internet use that is consistently reported more among women than men. And this remains across ages until the 75-79 age group. Overall 27 per cent of women and 24 per cent of men use the internet for these purposes.
- All uses of the internet become less common with declining wealth. However the rate of drop varies by type of use. So, although networking and gaming becomes less commonly reported as wealth decreases, the difference between the highest and lowest quintiles, among both men and women, is much smaller than is observable among more popular activities, such as email and dealing with finances. About a third more men and women in the richest fifth of the population use the internet for networking and gaming, compared with the poorest fifth. While more than twice as many men and women in the richest fifth of the population use the internet for email and research, and for finances, compared with the poorest fifth.
- For both men and women aged 50 or older those with no difficulty in accessing services are more likely than those with difficulty to use the internet frequently (78 per cent with no difficulty compared with 65 per cent with difficulty for men and 70 per cent compared with 47 per cent for women). (Difficulty is defined as it being quite or very difficult to access at least one service from a predefined list of: bank or cash point, post office, corner shop, medium or large supermarket, shopping centre, general practitioner, chiropodist, dentist, optician and hospital.)

What is the relationship between internet use and wellbeing?

- The cross-sectional association between internet use and a range of wellbeing outcomes was examined, net of the influence of gender, age, wealth and self-rated health.
- More frequent internet use is significantly associated with lower levels of depression and higher quality of life, but internet use was not associated with satisfaction with life.
- More frequent internet use was also associated with higher levels of social and civic

engagement, but it was not associated with levels of social isolation.

- However, frequent internet use was associated with greater (rather than lower) feelings of loneliness.

Introduction

This report is focussed on examining factors that relate to older people's use of digital technologies. It concentrates on those aged 50 or older, and examines within this group how age, gender, socioeconomic position and where people live influences: access to the internet, frequency of internet use, where they use the internet, types of devices they use, and what they use the internet for. It begins with a review of existing literature and then moves on to analyse data from the English Longitudinal Study of Ageing (ELSA) (Stephoe *et al.* 2013).

Background

Differences between the younger and older population in rates of digital engagement are well recognised (Dutton *et al.* 2009, Green and Rossal 2013, Wei 2012). Older people are less likely to engage with digital technology than their younger counterparts, and their lower rate of engagement has persisted over time, with a slow rate of progression towards equal rates of use. Interventions designed to increase the rate of internet access and use within the older population have been limited in their effectiveness, and are said to be hindered by a lack of detailed knowledge of the characteristics of older digitally excluded people (Green and Rossal 2013).

In fact, the older population is a 'diverse user group' of digital technology (Morris *et al.* 2007, p. 55) and cannot be considered homogeneous (Hill *et al.* 2008). The patterning of factors related to the use of digital technologies may be different for older people than those observed in the wider population (Green and Rossal 2013) and it is possible that the characteristics of the older digitally excluded will change over time. As people with more easily surmountable barriers engage with internet technology, the remaining disengaged group will comprise those with barriers that are persistent and difficult to overcome. Gaining a detailed knowledge of factors that currently relate to the use of digital technologies therefore means focusing on recent research that concentrates specifically on the older population.

This review summarises the key findings and recommendations from the body of literature surrounding digital engagement in the older population. Inequalities between men and women and across socioeconomic groups are of particular interest. Before progressing, there are two points to note: first, the definition of older person differs throughout the literature. The spread of age ranges observed varies with '50 and over' on the lower end of the scale and 'over 65' on the higher end of the scale. Approximately half of the papers cover age ranges that exactly coincide with the 50 and over population. A second issue arising from the included studies is the manner in which digital engagement is measured. In most cases – and particularly where survey data are involved – the measure is a simple binary indicator of whether or not the respondent has ever used the internet. In the majority of studies there is little consideration of how recently or frequently the technology may have been used, nor for how long, nor for what purposes.

This review progresses in the next section with a summary of recent literature that examines digital inequalities between older men and women. Following that, evidence for differences in engagement across socioeconomic indicators is considered.

Gender inequalities

There is evidence to suggest that use of the internet is higher among older men than women. From an analysis of data from the Understanding Society survey, covering individuals aged 55 and over, Green and Rossal (2013) find that men are estimated to be 1.25 times more likely to use the internet than women of this same age. Green and Rossal's (2013) analysis is one of the few available quantitative investigations into varying rates of internet use – other research that considers gender differences uses qualitative methods that are small in scale and often with samples potentially biased towards those predisposed to digital engagement.

A study by Morris *et al.* (2007) is one example of this qualitative research. In this study 120 people from two distinct older populations were interviewed to ascertain their rate of internet use and non-use. In the first Scotland-wide sample of people aged 50 and over, 57 per cent of men had used the internet compared with 40 per cent of women; in the second sample from Derbyshire covering ages 55 and above the figures were 35 per cent for men and 26 per cent for women. These findings do correlate with those from Green and Rossal's (2013) work in that usage rates for men are higher than for their female counterparts. However, the two samples in Morris *et al.*'s (2007) study differ with respect to location and age range, but also in the mode of internet access considered. The Scottish sample was based on respondents who accessed the internet only through a computer, whereas the Derbyshire group included internet use through any mode. This focus on mode of internet use is a novel dimension to the study, but, because of the additional differences in age and location, we cannot draw any strong inferences from these data on how mode of access might influence internet usage.

Official statistics from the Quarterly Internet Survey (Office for National Statistics 2014) provide an indication of longer term trends in internet use for older men and women. In this work older men and women are categorized into age brackets of 55 to 64 years and 65 to 74 years. The data show that in 2011 80.4 per cent of 55 to 64 year old men reported having used the internet compared with 77.6 per cent of women of this age; however figures for the 65 to 74 age group show a greater gender gap with 61.9 per cent for men and 52.7 per cent for women. This suggests the gender difference may vary with age and be more pronounced among the oldest of this population. Figures for 2014 show a similar pattern. In that year, in the 55 to 64 year old group 88.7 per cent of men reported ever having used the internet compared with 86.4 per cent of women, but, as before, the difference between usage rates is higher in the 65 to 74 age band with figures of 73.6 per cent for men and 67.7 per cent for women. So, while the proportion of those aged 55 and over that used the internet has increased during this three year period, there is evidence of an enduring gender difference in the oldest age group.

The patterns of internet use and gender differences discussed here clearly contrast with those observed in the younger population. Usage rates for people aged less than 45 remained stable between 2011 and 2014, at over 90 per cent and with negligible difference between men and women (Office for National Statistics 2014). Gender inequalities in internet use are seemingly

unique to the older population, but there is a scarcity of detailed and robust research that investigates this in more depth.

The focus of the literature discussed thus far is on the rate of internet use. However Wei (2012) asserts that it is the types of usage that matters most when examining potential divides; that is, the extent to which the internet is used as a recreational activity versus access for information services. It is possible that older people have a narrower range of goals and activities when online than younger cohorts (Wei 2012), but there is limited evidence on what these differences in goals and activities might be. There is, as Sourbati (2009, p. 1088) explains, only a 'minor body of qualitative studies into small samples' that considers this issue. Morris *et al.* (2007) is an example of one; they conclude that women aged 50 and over prefer to use the internet to communicate with friends and family, whereas men are more likely to use it for information and research purposes. In their study men also had a greater incidence of online shopping and banking than women. However, they have little to say about age differences.

Socioeconomic inequalities

Internet use in the wider population varies across people from different socioeconomic groups (Hill *et al.* 2008, Dutton *et al.* 2009). However, as is the case with gender, there is limited published research that examines differences in the use of digital technologies across socioeconomic groups among older adults. The research that is available includes a range of indicators of socioeconomic group, such as income, poverty level, education status, or occupational class, and that is summarised here.

Green and Rossal (2013) find that low income is correlated with low levels of internet use among people aged over 55. This is consistent with the relationship between income and internet use observed in the wider population aged 14 and over, where people with lower income have also been found to be less likely to report using the internet (Dutton *et al.* 2009). However the income effect may be greater within the 55 and over population. People of this age and in the highest income category are over five times more likely to use the internet than those in the lowest income group (Green and Rossal 2013), but in the 14 and over population this ratio is estimated as only twice as high (Dutton *et al.* 2009).

In addition to income, Green and Rossal (2013) refer to a possible relationship between pensioner poverty and internet use. They consider internet use for various regions within England and Wales and suggest that areas with high rates of pensioner poverty might have a higher proportion of people who have never used the internet. The authors stress, however, that this is a tentative finding due to considerable uncertainty in the survey data used in their analysis, and there is no available alternative research to support this finding. Nevertheless, Green and Rossal (2013) advocate geographical variation in digital inequalities as a topic for further research.

Possible relationships between each of education and occupational class and digital inequalities in the older population are referred to in the literature, but this literature provides limited evidence. The evidence for education level is conflicting. Results from some sources indicate that educational attainment does relate to internet use (Friemel 2014, Helsper and Eynon 2010, Selwyn 2004), but Green and Rossal (2013) find no evidence of this relationship and assert its significance

has been overstated in other studies. Occupational class is referenced only briefly in the literature (although this is not unusual in research with older people), with older people in professional and non-manual classes reported to have a higher rate of internet use in one recent study (Friemel 2014).

Methods

Data and sample

The data used in this analysis are taken from the English Longitudinal Study of Ageing (ELSA), which is a multidisciplinary, nationally representative, that collects detailed information on the health, economic and social circumstances of people aged 50 and over. The first wave was collected in 2002-3 and participants have been interviewed biennially thereafter, allowing a longitudinal examination of changes in their circumstances over time. The multidisciplinary and longitudinal nature of ELSA makes it a unique and powerful source of data for the study of individual circumstances in later life.

At wave 6 of ELSA, collected between 2012 and 2013, detailed questions were asked of all respondents (10,372 individuals aged 50 and over) on internet use covering: frequency of use, location of use, devices the internet is accessed from and reasons for use. This allows a detailed mapping of who uses the internet, with what frequency, how it is used and what it is used for. Simple descriptive statistics are used to show the relationships between individual characteristics and internet use, and multivariate analyses are used to show the cross-sectional association between internet use and wellbeing.

Throughout the duration of ELSA (six data collections covering the period 2002/3 to 2012/14)) basic information was collected on whether or not individuals used the internet. This allowed for an examination of changing levels of internet use for individuals and how that relates to their characteristics. This analysis is based on responses from participants who were interviewed at wave 1 of ELSA and who responded to the study at least once, which gives 40,534 observations from 10,886 participants. Multilevel growth models were used to analyse these longitudinal data, which shows the average prevalence of internet use at the starting point (wave 1 of ELSA) and how this changes over time, and how both starting points and changes over time vary according to people's characteristics.

Measures

Internet use

Waves 1 to 5 of ELSA ask respondents whether or not they participate in a list of activities including whether or not they use the internet and/or email (among other items such as, taking outings, holidays and reading newspapers). Potential responses are binary. At wave 6, participants are asked a more detailed set of questions regarding internet use. Rather than a binary variable covering any internet use, respondents are asked how frequently they use the internet, with the possible responses *'every day or almost every day'*, *'at least once a week (but not every day)'*, *'at least once a month (but not every week)'*, *'at least once every three months'*, *'less than every three months'* and *'never'*. Frequency tables of internet use at waves 1-5 show a similar number of people consider themselves users of the internet as those who at wave 6 who state they use the internet once a week or more. So, when combining the wave 6 data with the waves 1-5 data for the

purpose of the longitudinal analyses we include as 'internet users' those who used the internet once a week or more (the top two categories of response to the wave 6 frequency question).

For some of the cross-sectional analyses using wave 6 data in this report a four-category version of the wave 6 frequency of internet use variable is used. Here, respondents are broken down into those who use the internet *every day or almost every day, between once a week and once a month, once a month or less, or never*.

Location of internet use

At wave 6, respondents are also asked to provide details of the locations at which they had used the internet over the past three months. Possible response categories are: '*at home*', '*at places of work (other than home)*', '*at a place of education*', '*at another person's home*', '*on the move*' and '*other place (such as the library or an internet cafe)*'. Respondents could list more than one location of use.

Devices used to access the internet

The wave 6 data also ask participants to list which devices they used to access the internet from the categories: '*desktop computer*', '*laptop computer*', '*tablet computer (e.g. iPad, Samsung Galaxy Tab)*', '*smartphone (e.g. iPhone, Blackberry)*', '*TV (games console or set top box)*', '*other mobile devices*', '*don't know*' and '*do not access the internet*'. Again, respondents could list as many relevant answers as applied.

Activities the internet is used for

The final question relating to internet use asked at wave 6 focussed on reasons for using the internet within the last three months. The original variable consisted of a possible thirteen internet uses, of which respondents could list all of relevance. There was also an option for respondents to state they use the internet for none of the listed activities. The thirteen activities were: '*sending/receiving emails*', '*finding information about goods and services*', '*searching for information for learning, research or fact finding*', '*finances (banking, paying bills)*', '*shopping or buying goods or services*', '*selling goods or services over the internet, e.g. via auctions*', '*social networking sites (Facebook, Twitter, Myspace)*', '*creating, uploading or sharing content (YouTube, blogging or Flickr)*', '*news, newspaper or blog websites*', '*streaming or downloading live or on demand TV, radio (BBC iplayer, 4OD, ITV player, Demand 5), music (iTunes, Spotify) or ebooks*', '*games*', '*looking for a job or sending a job application*' and '*other*'.

Prior to running the analyses presented within this report, a principal components analysis (PCA) model was used to reduce the thirteen items of reasons for internet use into a smaller set of meaningful categories. However, this analysis did not successfully identify categories of use. Rather it identified a group of frequent internet users who were likely to participate in almost all activities, with other identified groups not being particularly meaningful in terms of types of older internet users. As an alternative, frequencies of internet use for each activity were examined by sex, age and wealth, and five distinct categories of typical internet use were subsequently identified:

- Frequently observed activities (sending/receiving email, finding information about goods or services, searching for information for learning or research, shopping or buying goods

and services, news or newspaper websites and streaming or downloading live or on demand TV or radio);

- Finances (banking or paying bills);
- Networking (social networking sites such as Facebook or Twitter and playing games);
- Jobs (looking for jobs or sending job applications);
- Other (less frequently observed activities, including selling goods or services, creating or uploading content and activities contained within the original 'other activity' item).

Demographic and socio-economic measures

The forthcoming analyses use a range of measures in order to differentiate the characteristics of internet users aged 50 and over. These measures are outlined in the paragraphs below.

Gender: All descriptive analyses are run for men and women separately.

Age cohort: Age is separated into five-year age groups for both the cross-sectional and longitudinal analyses. Cross-sectional analyses, using wave 6 data, show information on aspects of internet use by age group (50-54, 55-59, 60-64, 65-69, 70-74, 75-80 and 80 and over). The longitudinal analyses examine change in internet use over the data collection period by age cohort group defined as age group at wave 1.

Wealth: Wealth quintiles are used to define individuals' total household wealth excluding pension wealth (because pension wealth correlates linearly with age). The wealth variable includes the net financial and physical wealth and the net housing wealth for each household.

Location: Three variables are used to examine trends in internet use on the basis of location. The first is Government Office Region (GOR). GORs were first established in England in 1994. Wave 6 of ELSA divides the population into nine regions of England: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East and South West. ELSA also lists respondents who live outside of England by region, but as these numbers were very low (n=35), these respondents were recoded as missing and are therefore excluded from the tables showing internet use by GOR.

The second measure of location is the Department of the Environment, Food and Rural Affairs (DEFRA) identifier of whether the respondent lives in an urban or rural area. The variable has four categories: urban (an area with a population greater than 10,000), town and fringe, village, and hamlet or isolated dwelling.

Finally, location is measured in terms of quintiles of the 2004 Index of Multiple Deprivation (IMD), which is a measure of deprivation at the small area level created by the Department for Communities and Local Government. There are seven domains of deprivation used to capture the level of deprivation within each area, and these are income deprivation, employment deprivation, health deprivation and disability, education, skills and training deprivation, barriers to housing and services, crime and living environment deprivation.

Access to services: The report considers the relationship between internet use and respondents' physical access to services. Access to services is measured using a variable that asked respondents whether they find it very easy, quite easy, quite difficult or very difficult to access a range of

services. They were also offered the option of responding that they are unable to go, or do not wish to go. The list covers ten services: a bank or cash point, post office, corner shop, medium or large supermarket, shopping centre, general practitioner, chiropodist, dentist, optician and hospital. The analysis concerning access to services presented in this report uses a binary variable that identifies whether the respondent had at least one difficulty in accessing a service, or whether they had no difficulty accessing any of the services. A cut-off of one difficulty was used as the number of people experiencing more than one was reasonably low (n=928) and crosstabs of internet use by this variable often showed cells with very low frequencies.

Wellbeing measures: The final set of analyses considered the association between internet use and wellbeing. Here, wellbeing was assessed using a range of measures described next.

Depression: Depression was measured using an eight-item version of the CES-D scale, comprised of questions asking respondents whether, over the last week, they have suffered feelings of depression, loneliness and sadness, whether they have suffered restless sleep or feelings of everything being effortful, whether they struggled to 'get going' and whether or not they have often felt happy and enjoyed life. A lower score is indicative of lower levels of depression, and potential scores range from zero to eight.

Quality of life: Quality of life was measured using the Control, Autonomy, Self-realisation and Pleasure (CASP) scale, which is specifically designed to measure life quality among older populations (Hyde *et al.* 2003). The models in this report use a 15-item version of CASP in place of the usual 19-item version (Vanhoutte *et al.* 2012) and covers aspects such as feelings of control, pleasure, enjoyment, meaning, sociability, happiness, opportunity and satisfaction. Respondents were asked how often these feelings are experienced (e.g. 'I look back on my life with a sense of happiness') and are offered the response options of *often*, *sometimes*, *not often* and *never*. Subsequently, a continuous scale is constructed, with a possible range of 0 (poorest quality of life) to 45 (highest quality of life).

Satisfaction with life: Satisfaction with life was measured using the Diener (1984) scale that asks the respondent to rate how satisfied they are with five aspects of their life: how ideal their life has been, the conditions of their life, whether or not important goals have been attained, whether they would change anything about the way in which their life has been lived and how satisfied they are with their life overall. Again, respondents were offered a range of response options: *strongly agree*, *agree*, *slightly agree*, *neither agree nor disagree*, *slightly disagree*, *disagree* and *strongly disagree*. A continuous scale is derived from these variables, with a potential range of 1 (highest life satisfaction) to 35 (lowest life satisfaction).

Social isolation: Social isolation was measured using a four-item measure that asks the respondent about lack of companionship, feeling left out, feeling isolated and feeling out of tune with others around them.

Loneliness: Loneliness was measured using a binary version of a question that asked the respondent how often they feel lonely. Participants were considered to not experience loneliness if they respond to the original question with the response *never* or *hardly ever*, and are considered to experience loneliness if they answer either *some of the time*, or *often*.

Social and civic engagement: Social and civic engagement was measured using a continuous variable comprised of whether or not the respondent answered positively to eight questions regarding their involvement in various social and civic organisations, including political parties, resident groups, religious groups, charitable organisations, education or evening classes, social clubs, sport and exercise clubs and 'other' organisations, clubs or societies. A score of 0 reflects non-participation in any of the listed organisations, and a score of 8 reflects participation in them all.

Self-rated health: Although not used as an outcome itself, the models in the wellbeing analysis control for a person's self-rated health (given the correlation between health and both wellbeing and internet use). Here, self-rated health is measured using a Likert-scale question asking how the individual rates their overall general health. The five categories of *excellent*, *very good*, *good*, *fair* and *poor* are offered as responses. In the models, a lower score indicates better self-rated health.

Statistical analysis

Sections 1 to 5 of the results chapter of the report display basic cross-tabs of internet behaviours and other variables of interest using wave 6 of the ELSA data (2012-2013). Results are always broken down by gender, and all tables are weighted using the wave 6 cross-sectional weight.

Section 6 of the results chapter takes advantage of the longitudinal nature of the ELSA data in order to examine trajectories of internet use over time by age cohort. Waves 1 to 6 of ELSA (2002 to 2012-2013) are used to observe patterns of frequent internet use over time by age cohort at wave 1 (2002). Multilevel growth curve models are run in order to observe the level of internet use at wave 1 and the subsequent rate of change in internet use across cohorts at equivalent ages at different points in time, dependent on the respondent's age cohort at wave 1. Models also demonstrate whether these trajectories vary on the basis of gender and wealth.

Section 7 of the report uses linear and logistic regression models to examine associations between frequency of internet use and reasons for internet use, and six different aspects of mental and social wellbeing. The models for each wellbeing outcome contain relevant control variables that potentially explain the relationship between internet and wellbeing: gender, age, wealth and self-rated health. Linear regression models are used to examine the association between internet use and wellbeing for the five outcomes using continuous scales (depression, quality of life, life satisfaction, social isolation and social and civic engagement), and a logistic regression model is used to examine the association between internet use and loneliness, which is measured using a binary variable. The wave 6 cross-sectional weight is applied to these analyses.

Results

1. Variations in internet use among people aged 50 and over by gender, age and socioeconomic position

Frequency of internet use

Tables 1 and 2 show the frequency of internet use by gender, age and wealth, weighted by the wave 6 cross-sectional weight. Here, frequent users are denoted as those who state they use the internet either once a day or almost once a day, or at least once a week. Non-frequent users are denoted as those who use the internet around once a month or less, or never. Non-frequent users are combined into the same category as those who never use the internet as the numbers of people using the internet less frequently were low, especially when broken down by age group and wealth quintile.

Base: all wave 6 ELSA respondents

Table 1. Frequency of internet use by gender and age at wave 6 (per cent)

	50-54	55-59	60-64	65-69	70-74	75-79	80+	All
Men								
At least once a week	91.0	85.9	79.9	71.9	55.4	43.7	34.7	71.2
Once a month or less/never	9.1	14.1	20.1	28.1	44.6	56.3	65.3	28.8
Women								
At least once a week	80.7	80.5	72.9	61.2	48.6	29.8	13.9	59.7
Once a month or less/never	19.3	19.5	27.1	38.8	51.4	70.2	86.1	40.3
<i>N (unweighted)</i>								
<i>Men</i>	266	620	790	783	556	462	397	3874
<i>Women</i>	451	873	939	862	632	561	482	4800

Tables 1 and 2 show that in 2012-13, notable differences exist in the frequency of internet use by each of gender, age and wealth. Across all age and wealth groups, over seven in ten men use the internet frequently, compared with less than six in ten women. The percentage of people using the internet frequently shows a strong declining gradient with age. Over 90 per cent of men aged 50 to 54 use the internet frequently, but by age 80 only just over a third of men are frequent internet users. The proportion of women using the internet by age 80 is even lower at just under 14 per cent, less than half the proportion of men of the same age using the internet. By age 75 for men, and by age 70 for women, less than half of the older population are using the internet frequently.

Base: all wave 6 ELSA respondents

Table 2. Frequency of internet use by gender and wealth at wave 6 (per cent)

	Poorest	2 nd quintile	Middle	4 th quintile	Richest	Total
Men						
At least once a week	50.4	63.8	68.1	78.6	87.4	71.0
Once a month or less/never	49.6	36.2	31.9	21.4	12.6	29.0
Women						
At least once a week	40.5	52.3	55.3	68.7	79.8	59.5
Once a month or less/never	59.5	47.7	44.7	31.3	20.2	40.5
<i>N (unweighted)</i>						
Men	451	594	721	796	826	3388
Women	708	833	912	888	899	4240

The same gradient relationship can be observed on the basis of wealth quintiles in Table 2. Only half of men and 40.5 per cent of women in the poorest wealth quintile use the internet frequently, compared with 87 and 80 per cent of men and women, respectively, in the wealthiest quintile.

Places used to access the internet

Tables 3 and 4 show the locations at which older people use the internet, broken down again by gender, age and wealth, and again weighted using the wave 6 cross-sectional weight. Here, the sample consists only of individuals who have used the internet within the past three months. Respondents were allowed to state more than one place in which they had accessed the internet within the time frame of interest. Both tables show that of the relevant sample, the percentage accessing the internet at home remains consistently high at 96 to 99 per cent. As would be expected, however, the percentage of people accessing the internet from places of work falls rapidly as age increases, reflecting workforce exit. The percentage of both men and women using the internet at other people's houses falls steadily across age groups, although the proportions of men and women accessing the internet from others' houses are consistently similar to one another, regardless of age. In contrast, among internet users notably higher proportions of men than women access the internet while on the move, although the percentage of both men and women accessing the internet on the move also drops rapidly with increasing age.

Base: those who have used the internet in the past three months

Table 3. Places of internet use by gender and age at wave 6 (per cent)

	50-54	55-59	60-64	65-69	70-74	75-79	80+	All
Men								
Home	97.6	96.3	98.8	98.8	99.4	99.2	97.4	98.0
Work	62.4	55.2	33.5	15.5	[8.1]	[2.6]	[1.3]	35.7
Educational	[4.4]	[6.8]	[2.3]	[2.2]	[1.0]	[1.8]	[1.5]	3.5
Other people's houses	25.2	22.5	19.5	20.5	18.6	[11.3]	[7.6]	20.4
On the move	42.0	38.1	27.2	17.0	[11.4]	[6.0]	[2.5]	27.1
Other	13.7	13.1	[9.8]	[12.3]	[7.0]	[6.0]	[6.7]	11.1
Women								

Home	97.1	98.4	98.3	98.4	98.3	98.6	97.8	98.1
Work	60.1	51.4	25.9	[7.8]	[3.3]	[1.2]	[0.0]	31.6
Educational	[3.2]	[4.8]	[2.3]	[1.4]	[4.3]	[0.8]	[3.1]	3.1
Other people's houses	25.1	21.4	21.4	16.7	13.6	[11.2]	[6.2]	19.6
On the move	30.7	26.7	18.8	10.6	[5.0]	[2.3]	[1.5]	19.0
[Other]	[7.1]	[6.5]	[6.9]	[3.9]	[5.4]	[5.7]	[3.0]	6.0
<i>Unweighted N</i>								
Men	240	552	678	616	342	237	157	2822
Women	400	767	749	606	356	213	87	3178

Strong associations appear to exist between places of internet access and wealth. While a consistently high proportion of people aged 50 and over access the internet from home across all wealth quintiles, internet use at work is consistently higher among those in wealthier quintiles for both men and women. Accessing the internet from someone else's house is more common among internet users in wealthier quintiles, as is accessing the internet while on the move. The percentage of women accessing the internet on the move is over twice as high in the wealthiest quintile (25.5 per cent) than the poorest quintile (11.7 per cent). Men are consistently more likely to access the internet while on the move than women, but there is also a strong gradient by increasing wealth quintile.

Base: those who have used the internet in the past three months

Table 4. Places of internet use by gender and wealth at wave 6 (per cent)						
	Poorest	2 nd quintile	Middle	4 th quintile	Richest	Total
Men						
Home	95.8	96.1	98.8	98.0	99.4	98.0
Work	31.7	35.8	34.6	34.2	38.4	35.4
Educational	[4.9]	[3.5]	[2.8]	[3.0]	[4.0]	3.6
Other people's houses	[18.3]	16.8	14.6	19.5	28.8	20.4
On the move	[22.5]	21.9	22.1	24.4	38.4	27.1
Other	[10.6]	[5.4]	[8.1]	[11.2]	[17.8]	11.3
Women						
Home	98.1	95.3	98.5	98.2	99.5	98.1
Work	20.0	35.5	30.3	35.3	31.8	31.4
Educational	[1.2]	[2.7]	[3.1]	[3.9]	[3.1]	2.9
Other people's houses	13.8	15.2	18.7	21.8	24.1	19.5
On the move	[11.7]	16.5	15.2	19.9	25.5	18.7
Other	[7.0]	[4.4]	[4.1]	[5.8]	[8.2]	6.0
<i>Unweighted N</i>						
Men	216	362	493	368	734	2443
Women	297	471	536	653	746	2703

Devices used to access the internet

Tables 5 and 6 show information on devices used to access the internet by gender and age, and gender and wealth, respectively. The results of both tables are weighted using the wave 6 cross-sectional weight. Across all age groups and wealth quintiles, desktop computers and laptops remain the most popular device of internet use. Desktop computers are used to access the internet by 70 per cent of male and 60 per cent of female internet users aged 50 or older, and laptop computers are used at similar rates to the use of desktop computers (67 per cent of male and 68 per cent of female internet users). However, as age increases, the proportion of both men and women using laptops falls at a faster rate than those using desktop computers. By age 80 and over, the use of desktop computers for internet access is 8 per cent lower for men and 9 per cent lower for women at age 50-54. The reduction in use of laptop computers between the same ages is 23 per cent and 33 per cent for men and women, respectively. This may reflect younger cohorts of older people having better access and knowledge of newer technology, such as the use of laptops rather than desktop computers, perhaps through means such as belonging to working environments or larger social networks. Or it may reflect the relative ease of use of desktop compared with laptop computers. Interestingly, a higher percentage of men use a desktop computer than a laptop among all age groups other than 60-64, yet a higher percentage of women use laptop computers than desktop computers among all age groups until age 80. Among men, the difference in the percentage of desktop computer and laptop users increases notably with age, from a difference of 1 per cent greater desktop use at age 50-54 to a difference of 17 per cent by age 75. Although the difference in percentage of desktop computer and laptop users among women declines with age, the gradient is less consistent and smaller across age groups, from 12 per cent higher laptop use at age 50-54 to 3 per cent higher by age 75-79.

Base: those who have used the internet in the past three months

Table 5. Devices of internet use by gender and age at wave 6 (per cent)

	50-54	55-59	60-64	65-69	70-74	75-79	80+	All
Men								
Desktop computer	73.7	74.1	65.3	67.7	65.7	68.8	65.6	69.6
Laptop computer	72.5	71.0	69.0	63.5	61.3	52.0	49.1	66.6
Tablet computer	[16.5]	21.7	16.7	13.2	[10.2]	[8.4]	[8.6]	15.6
Smartphone	48.3	42.7	29.7	18.0	[9.7]	[3.7]	[5.1]	30.0
TV (e.g. games console)	[12.0]	14.3	7.9	[4.4]	[3.6]	[0.8]	[1.2]	8.4
[Other mobile device]	[5.8]	[6.3]	[5.0]	[3.5]	[0.8]	[1.2]	[0.7]	4.4
Women								
Desktop computer	65.1	66.9	60.5	52.3	51.3	51.4	[56.0]	60.1
Laptop computer	77.1	72.0	70.3	64.6	58.7	54.7	[43.8]	68.4
Tablet computer	15.3	18.6	15.0	11.0	[10.4]	[7.9]	[6.1]	14.2
Smartphone	37.8	27.2	17.1	11.0	[5.0]	[2.4]	[0.0]	20.3
[TV (e.g. games console)]	[6.6]	[5.4]	[3.4]	[2.9]	[0.6]	[0.8]	[1.5]	4.0
[Other mobile device]	[4.9]	[3.7]	[5.3]	[3.2]	[3.2]	[0.9]	[1.5]	3.9

<i>Unweighted N</i>								
<i>Men</i>	240	552	677	615	340	236	157	2817
<i>Women</i>	400	766	751	606	357	211	86	3177

The use of tablet computers by age 80 and over is half of that at age 50-54 among men, and almost two thirds lower among women. There is also a sharp decline with age in the proportions of men and women using smartphones for internet access. Almost half of men aged 50-54 use smartphones to access the internet, but by age 70-74 this figure is less than 10 per cent and it continues to decline thereafter. Over a third of women use smartphones at age 50-54, but only 5 per cent do so at age 70-74 and, as for men, the proportion continues to decline thereafter. Again, this may reflect greater access to sources of knowledge about such technology for younger people, such as the workplace and larger social networks. Or the usability of such technologies for older people.

Table 6 shows descriptive statistics of devices used for internet access by gender and wealth. The use of desktop computers is consistently more common among those in higher wealth quintiles. The use of desktop computers among men increases at a slower rate than women as wealth quintile increases. As was demonstrated with the relationships between age and device use, men are consistently more likely to use desktop computers than laptops, and women are consistently more likely to use laptops than desktop computers. Among the lowest wealth quintile, considerably more women use laptops than desktop computers, but the percentage difference decreases notably as wealth increases. The difference between desktop computer and laptop use among men is never as marked as it is among women in all wealth quintiles.

Base: those who have used the internet in the past three months

Table 6. Devices of internet use by gender and wealth at wave 6 (per cent)						
	Poorest	2 nd quintile	Middle	4 th quintile	Riches	Total
Men						
Desktop computer	65.1	69.7	68.0	70.8	72.3	69.8
Laptop computer	64.8	64.1	63.2	66.1	72.3	66.7
Tablet computer	[12.4]	[12.5]	13.5	15.2	20.8	15.6
Smartphone	[28.1]	26.4	25.8	27.2	37.9	29.8
TV (e.g. games console)	[11.9]	[8.7]	[6.9]	[7.1]	9.1	8.4
[Other mobile device]	[8.1]	[4.9]	[3.0]	[3.5]	[4.1]	4.4
Women						
Desktop computer	44.9	58.9	56.0	64.0	67.6	59.9
Laptop computer	72.8	68.6	67.1	64.9	68.9	68.1
Tablet computer	[6.5]	[9.0]	[9.1]	17.3	22.2	14.0
Smartphone	[15.1]	21.9	14.5	22.8	22.9	20.0
[TV (e.g. games console)]	[5.2]	[3.5]	[3.9]	[3.8]	[3.6]	3.9
[Other mobile device]	[3.4]	[5.2]	[3.7]	[2.7]	[4.5]	3.9
<i>Unweighted N</i>						
<i>Men</i>	216	362	492	637	731	2438

The associations between frequency of internet use, age and wealth

Table 7 shows associations between frequent internet use by age cohort and wealth quintile simultaneously, and again is weighted using the wave 6 cross-sectional weight. As in tables 1 and 2, frequent internet users are defined as those who state they use the internet at least once a day, almost every day or at least once a week, and non-frequent users are those who use it both less frequently or never. As would be expected, Table 7 shows internet use is less frequently observed among those in lower wealth quintiles regardless of age group. However, among those in the poorest wealth quintile, only half of people aged 60-64 are frequently using the internet, while among those with the highest levels of wealth the percentage of people using the internet frequently does not reach 50 per cent or less until age 80. Similarly, in the 75-79 age group less than a fifth of people in the poorest wealth quintile frequently access the internet, compared with over half of people aged 75-79 in the wealthiest quintile. These associations suggest that differences in internet behaviour occur not only as the result of age, but of social position. So, differences in internet use among older people in England are likely to be the result of both age and social circumstances.

Base: all wave 6 ELSA respondents

Table 7. Frequent internet use (uses the internet either once a day, almost every day, or at least once a week, compared with a reference group who use the internet less frequently or never) by age and wealth quintile.

	Poorest	2 nd quintile	Middle	4 th quintile	Wealthiest
50-54	68.4	87.1	89.3	94.2	94.5
55-59	67.4	72.6	87.1	91.8	97.1
60-64	50.7	64.7	74.7	84.9	91.8
65-69	33.9	57.0	62.6	75.0	84.0
70-74	[26.8]	35.3	48.9	59.1	77.8
75-79	[18.5]	29.7	34.9	40.2	57.0
80+	[13.4]	12.6	[19.4]	35.6	42.8

Unweighted

N

50-54	107	129	74	91	84
55-59	199	245	216	253	263
60-64	201	246	291	356	403
65-69	179	245	314	376	403
70-74	138	202	284	245	260
75-79	163	185	248	199	197
80+	172	175	206	164	115
Total	1159	1427	1633	1684	1725

2. Reasons for internet use

The data collected at wave 6 of ELSA allow in-depth observations of the reasons for internet use among people aged 50 and over in England. For the purpose of the analyses presented within this report, the original thirteen listed reasons for internet use have been reduced to five key categories of reasons for internet use:

1. Frequently observed activities (sending/receiving email, finding information about goods or services, searching for information for learning or research, shopping or buying goods and services, news or newspaper websites and streaming or downloading live or on demand TV or radio).
2. Finances (banking or paying bills).
3. Networking (social networking sites such as Facebook or Twitter and playing games).
4. Jobs (looking for jobs or sending job applications).
5. Other (less frequently observed activities, including selling goods or services, creating or uploading content and activities contained within the original 'other activity' item).

The means by which these categories were decided are outlined in the Methods section of the report.

Base: those who have used the internet in the past three months

Table 8. Reasons internet use by gender and age at wave 6 (per cent)								
	50-54	55-59	60-64	65-69	70-74	75-79	80+	All
Men								
Email, research, etc.	71.7	71.2	72.6	66.1	52.3	40.0	28.8	64.5
Finances	51.5	44.1	45.8	39.5	23.7	20.2	12.7	37.5
Networking/gaming	37.8	30.7	26.7	20.7	14.2	[11.6]	[5.91]	23.7
Selling, uploading, other	28.0	23.9	20.3	17.0	[10.7]	[4.67]	[3.79]	17.7
Job searching/applications	16.1	13.4	[5.8]	[1.46]	[0.00]	[0.13]	[0.00]	6.7
Women								
Email, research, etc.	66.5	73.6	68.2	61.2	48.4	29.9	10.7	53.8
Finances	37.8	45.5	35.7	27.3	17.4	[9.1]	[2.5]	27.2
Networking/gaming	40.2	39.0	34.1	28.7	17.6	10.7	[3.3]	26.8
Selling, uploading, other	15.6	17.7	14.4	10.1	[6.3]	[2.8]	[1.6]	10.7
Job searching/applications	22.4	12.8	[3.3]	[0.8]	[0.1]	[0.0]	[0.0]	6.6
<i>Unweighted N</i>								
Men	349	792	919	914	631	544	530	4679
Women	570	997	1060	954	709	663	740	5693

Table 8 shows the reasons people used the internet by gender and age for those aged 50 and older in 2012-2013. The use of the internet is particularly common for activities such as: sending/receiving email, finding information about goods or services, searching for information for learning or research, shopping or buying goods and services, news or newspaper websites, and streaming or downloading live or on demand TV or radio. Sixty-five per cent of men and 54 per cent of women use the internet for one or more of these purposes.

There is a steep decline in all online activities as people reach older ages. Among men, however, there is little difference in the percentage reporting the most common internet activities, such as email and research, between age 50 and 65, at which point the percentage of men reporting using the internet for these purposes starts to reduce. This reduction coincides with the male state pension age, which might signify the end of certain work-related tasks, such as using email on a frequent basis. While over 70 per cent of men aged up to 64 use the internet for reasons such as email and research, by age 80 this has dropped to 28.8 per cent. Only around one in ten women aged 80 and over use the internet for the most commonly reported uses such as email and research.

Men are generally more likely to use the internet for financial purposes across all ages, although again, for both men and women, the percentage reporting using the internet for this purpose lessens with age. Over half of men aged 50-54 use the internet to deal with finances, compared with just 12.7 per cent of men aged 80 and over.

Network and gaming activities is the only category of internet use that is consistently reported more among women than men. And this remains across ages until the 75-79 age group. Overall 27 per cent of women and 24 per cent of men use the internet for these purposes.

As might be expected, using the internet for job searching and applications declines with age, and the number of people using the internet for these purposes falls to very low levels once the gender-specific state pension age group is reached.

Base: those who have used the internet in the past three months

Table 9. Reasons for internet use by gender and wealth at wave 6 (per cent)

	Poorest	2 nd quintile	Middle	4 th quintile	Riches	Total
Men						
Email, research, etc.	34.6	51.0	56.1	68.3	76.3	57.2
Finances	18.8	25.3	27.8	38.1	49.0	31.8
Networking/gaming	21.8	24.1	23.4	27.5	29.2	25.2
Selling, uploading, other	9.2	13.0	12.0	17.1	17.9	13.8
Job searching/applications	7.8	7.3	[5.9]	7.2	[5.6]	6.7
Women						
Email, research, etc.	32.0	47.5	51.7	64.6	74.5	53.4
Finances	15.6	23.1	23.5	32.5	41.7	26.9
Networking/gaming	22.2	25.5	25.0	31.4	29.7	26.6
Selling, uploading, other	6.5	8.7	9.5	13.6	15.0	10.5
Job searching/applications	7.5	6.6	5.7	7.1	6.6	6.7

Unweighted N

<i>Men</i>	<i>612</i>	<i>721</i>	<i>829</i>	<i>886</i>	<i>932</i>	<i>3980</i>
<i>Women</i>	<i>909</i>	<i>998</i>	<i>1042</i>	<i>995</i>	<i>996</i>	<i>4940</i>

All uses of the internet become less common with declining wealth. However the rate of drop varies by type of use. So, although networking and gaming becomes less commonly reported as wealth decreases, the difference between the highest and lowest quintiles, among both men and women, is much smaller than is observable among more popular activities, such as email and dealing with finances. About a third more men and women in the richest fifth of the population use the internet for networking and gaming, compared with the poorest fifth. While more than twice as many men and women in the richest fifth of the population use the internet for email and research, and for finances, compared to the poorest fifth. Similarly, around twice as many men and women in the highest wealth quintile use the internet for selling and uploading compared with those in the lowest quintile, although the percentage remains reasonably low across all quintiles. Finally, among both men and women, there is no discernible pattern of internet use for job searching and applications by wealth quintile, with a reasonably similar proportion of people in all quintiles reporting using the internet for this reason.

3. The relationship between different internet behaviours

Tables 10 and 11 show frequency of internet use by the places in which the internet is used. Table 10 shows row percentages (the frequency of internet use according to location) and table 11 shows the locations of internet use according to frequency.

Base: all wave 6 ELSA respondents

Table 10. Variation in frequency of internet use by places of internet use at wave 6

	Every day, or almost every day	At least once a week	Once a month or less	<i>Unweighted N</i>
Men				
Home	80.6	15.3	[4.1]	2801
Work	91.8	[7.2]	[1.0]	847
Other people's houses	92.2	[6.9]	[0.9]	557
On the move	95.0	[5.0]	[0.0]	697
Other (including place of education)	89.1	[8.3]	[2.6]	631
Women				
Home	72.8	19.1	[8.1]	3232
Work	91.1	7.7	[1.2]	964
Other people's houses	85.5	9.0	[5.0]	649
On the move	94.0	[5.3]	[0.7]	608
Other (including place of education)	81.4	[11.0]	[7.6]	289

Base: all wave 6 ELSA respondents

Table 11. Frequency of internet use by places of internet use at wave 6

	Every day, or almost every day	At least once a week	Once a month or less
Men			
Home	98.9	95.0	92.3
Work	41.0	16.4	8.1
Other people's houses	23.6	[9.0]	[4.1]
On the move	32.3	8.6	[0.0]
Other (including place of education)	14.6	[6.9]	[7.9]
Women			
Home	99.1	97.2	91.6
Work	40.0	12.7	4.2
Other people's houses	23.2	9.2	[12.3]
On the move	24.8	[5.2]	[1.4]
Other (including place of education)	9.5	[4.8]	[7.3]

Unweighted N

<i>Men</i>	2259	464	133
<i>Women</i>	2358	663	273

Table 10 shows that, for men and women, while the majority of people who access the internet from home do so every day, a higher percentage of people accessing the internet from all other locations report using the internet on a daily basis more frequently. This may, in part, be reflecting relationships between places and devices of internet use, especially when considering the high percentage of people who access the internet on the move and from other people's houses (especially among men) reporting they access the internet daily, or almost daily. Table 11 shows over 91 per cent of men and women across all frequency of internet access groups access the internet from home. Around 40 per cent of men and women who access the internet daily do so from work. Just under a quarter of men and women who access the internet daily or almost daily do so from other people's houses, yet under a tenth of people accessing the internet at least once a week but less than daily report doing so from the houses of others. The reduction in the percentage of both men and women who use the internet at least once a week, compared with daily, among those who report accessing the internet while on the move is even greater, with around three-quarters fewer men and almost four-fifths fewer women stating that they do so.

Base: all wave 6 ELSA respondents

Table 12. Variations in frequency of internet use by devices of internet use at wave 6

	Every day, or almost every day	At least once a week	Once a month or less	<i>Unweighted N</i>
Men				
Desktop computer	83.1	13.6	[3.3]	1953
Laptop computer	83.4	13.2	[3.3]	1882
Tablet computer	92.1	[7.0]	[1.0]	426
Smartphone	93.7	43.1	[0.5]	752
Other (including TV)	92.3	[7.1]	[0.7]	290
Women				
Desktop computer	79.1	15.2	[5.74]	1987
Laptop computer	74.4	17.3	[8.29]	2209
Tablet computer	83.7	12.2	[4.09]	485
Smartphone	91.6	[6.8]	[1.62]	635
Other (including TV)	84.4	10.6	[5.04]	250

Base: all wave 6 ELSA respondents

Table 13. Frequency of internet use by devices of internet use at wave 6

	Every day, or almost every day	At least once a week	Once a month or less
Men			
Desktop computer	72.4	60.2	53.5
Laptop computer	69.5	56.1	51.9
Tablet computer	18.0	[6.9]	[3.6]
Smartphone	35.2	11.0	[3.4]
Other (including TV)	13.7	[5.4]	[1.9]

Women				
Desktop computer	65.9	47.5	39.4	
Laptop computer	70.6	61.8	64.9	
Tablet computer	16.5	9.0	[6.6]	
Smartphone	25.8	[7.2]	[3.8]	
Other (including TV)	8.7	[4.1]	[4.3]	
<i>Unweighted N</i>				
Men	2259	463	129	
Women	2358	661	274	

Table 12 shows device of internet use by frequency of internet use. Among both men and women, the lowest proportion of people reporting using the internet daily can be observed among those using desktop and laptop computers. This is interesting in light of the previous table that suggests that those with more mobile devices, who are also likely to be those able to access the internet while on the move or in places outside of the home, are likely to access the internet more frequently than those who only access the internet from more 'static' locations, such as desktop computers and laptops which are harder to remove from the home. However, table 13 shows that among those who use the internet either less often than daily, desktop and laptop computers are noticeably the most commonly reported devices of internet access. Additionally, mobile devices of internet use, such as tablet computers and smart phones are noticeably more commonly used by the most frequent internet users rather than those using the internet less often.

Table 14 shows associations between devices and places of internet use. The variables ask respondents whether or not they have accessed the internet from the listed locations, as well as by means of the listed devices, and respondents are able to answer positively to all categories that apply. As a result, it is not possible to determine which devices are used at which locations, or at which locations specific devices are more commonly used. However, some associations appear to emerge.

Base: those who have used the internet in the past three months

Table 14. Places of internet use by devices of internet use at wave 6.					
	Home	Work	Other people's houses	On the move	Other (including education)
Men					
Desktop computer	69.4	82.1	71.5	74.2	77.2
Laptop computer	67.1	77.4	83.2	84.1	80.8
Tablet computer	15.6	21.5	31.0	31.4	29.2
Smartphone	30.4	51.0	56.2	82.8	48.8
Other (including TV)	11.9	16.8	19.3	23.3	20.1
Women					
Desktop computer	59.6	82.4	62.9	68.6	67.6

Laptop computer	69.1	77.1	80.2	82.2	79.4
Tablet computer	14.4	22.3	26.1	32.0	23.8
Smartphone	20.6	37.4	38.7	72.2	35.2
Other (including TV)	7.5	12.1	14.1	16.3	[8.2]

*Unweighted
N*

<i>Men</i>	<i>2796</i>	<i>846</i>	<i>556</i>	<i>697</i>	<i>359</i>
<i>Women</i>	<i>3228</i>	<i>964</i>	<i>648</i>	<i>608</i>	<i>289</i>

Among both men and women, desktop computer use appears to be highest among those who report accessing the internet from work. Laptop use is reported the most among those who have 'mobile' internet access, and report using it at other people's houses, on the move, and at 'other' locations. Tablet computer use is around twice as high among those who report using the internet at other peoples' houses, on the move and at other locations compared with those who report accessing the internet at home. Similarly accessing the internet via a smartphone is reported to a much greater extent among those who access the internet while on the move than any from any other type of location, with 82.8 per cent of men and 72.2 per cent of women reporting both smartphone use and access while on the move. Among both men and women, 'other' devices of internet use are reported least among those who report accessing the internet from home.

4. Variation in the use of internet by region and measures of area deprivation

The tables presented in this section of the report show information on internet use by three regional identifiers. Firstly, trends in internet use are examined by Government Office Region (GOR). Secondly, internet use is considered in relation to whether an individual lives in an urban or rural location type, and finally, we look at internet use in relation to quintiles of the index of multiple deprivation.

Internet use by Government Office Region

Base: all wave 6 ELSA respondents

Table 15. Frequency of internet use by Government Office Region at wave 6.

	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West
Men									
Every day	46.1	56.3	53.2	60.5	54.5	63.1	63.8	64.8	60.7
At least once a month	[16.8]	12.2	[10.9]	[11.1]	[10.5]	10.9	[9.0]	12.0	14.7
Once a month or less	[3.0]	[4.7]	[4.7]	[3.7]	[6.1]	[7.0]	[4.9]	[4.7]	[4.1]
Never	34.2	26.8	31.1	24.7	28.9	19.0	22.4	18.6	20.5
Women									
Every day	37.7	44.8	41.5	42.0	38.9	52.1	50.8	52.2	53.8
At least once a month	[12.3]	12.3	13.1	14.6	12.5	13.9	12.2	12.4	10.5
Once a month or less	[7.0]	[7.5]	[9.6]	11.1	[8.2]	[5.6]	[4.1]	7.3	[6.0]
Never	43.0	35.4	35.8	32.3	40.4	28.5	32.9	28.0	29.7
<i>Unweighted N</i>									
<i>Men</i>	227	433	386	417	426	516	337	698	458
<i>Women</i>	300	539	531	521	534	637	418	852	571

Table 15 shows frequency of internet use by GOR. The North East of England has the lowest rate of people using the internet every day or almost every day (46 per cent of men and 38 per cent of women), although among men, it has the highest rate of people using the internet at least once a month. The North East also has the highest proportion of both men and women who never use the internet (34 per cent and 43 per cent, respectively). The highest rates of most frequent internet use are found among both men and women in the East of England, London, the South East and the South West of England (for each region over 60 per cent of men and over 50 per cent

of women). These areas also see the lowest proportions of both men and women who never use the internet.

Base: those who have used the internet in the past three months

Table 16. Place of internet use by Government Office Region at Wave 6.

	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West
Men									
Home	96.2	99.2	98.6	97.5	98.7	97.0	97.1	97.6	99.4
Work	[32.3]	33.2	37.4	34.5	36.2	36.9	46.3	35.1	27.9
Other people's houses	[17.2]	17.8	[16.2]	[22.0]	[21.1]	19.5	24.8	22.4	18.9
On the move	[24.7]	25.2	[23.8]	[21.2]	26.9	27.7	37.2	26.8	27.0
Other (including place of education)	[9.6]	[13.5]	[10.4]	[13.7]	[12.6]	[12.0]	18.7	12.2	[13.1]
Women									
Home	95.6	98.7	98.3	97.2	97.1	97.9	98.3	98.5	98.9
Work	[34.8]	35.0	29.0	25.1	31.2	31.6	35.2	31.7	31.1
Other people's houses	[18.6]	19.8	[17.5]	[16.2]	20.0	23.9	19.9	18.1	20.9
On the move	[18.0]	19.5	[16.7]	[12.4]	19.8	20.6	24.2	16.1	23.0
Other (including place of education)	[6.2]	[8.2]	[8.1]	[5.7]	[7.6]	[8.7]	[12.1]	[7.4]	[9.6]
<i>Unweighted N</i>									
<i>Men</i>	143	309	253	301	291	396	249	546	356
<i>Women</i>	169	363	333	338	323	454	281	617	404

Table 16 shows locations in which the internet is accessed by GOR. While the percentage of people using the internet at home is similar across all regions, the highest percentage of men is found in the South West of England (99 per cent), and this is also the place in which the lowest percentage of men access the internet from places of work (28 per cent). Locations of internet use appear to be the most different in London, with over 46 per cent of men in London accessing the internet from work, noticeably the highest rate, with the second highest percentage of people

accessing the internet being men from Yorkshire and the Humber (37 per cent). The highest rates of internet use from other people's houses, on the move and 'other' locations are also among men in London. Women in London are also the most likely to access the internet from work (35 per cent), on the move (24 per cent) and from 'other' locations (12 per cent).

Table 17 shows devices used for internet access by GOR. Again, people in London appear to have slightly different trends in internet use than other locations in England. The highest proportion of male laptop users is found in London (72 per cent, compared with the second highest rate of 68 per cent in the North West). The highest rates of men using tablets and smartphones for internet access are also seen in London. While the previous section of the report showed women used desktop computers considerably less than men, the highest proportion of women using desktop computers can be observed in London and the South East. The highest percentage of women accessing the internet from smartphones is also observable in London (over a quarter).

Base: those who have used the internet in the past three months

Table 17. Devices for internet use by Government Office Region at Wave 6.

	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West
Men									
Desktop computer	65.8	65.1	70.1	64.7	69.3	72.5	69.2	72.5	72.0
Laptop computer	66.6	67.7	67.2	66.3	65.8	64.3	71.8	66.9	63.0
Tablet computer	[11.6]	[11.9]	[10.0]	[10.7]	[20.3]	16.9	20.5	16.8	16.7
Smartphone	[26.8]	32.7	26.0	26.5	29.6	31.4	37.6	28.1	28.4
Other (including TV)	[14.8]	[5.6]	[11.1]	[14.9]	[9.1]	[12.9]	[14.7]	12.8	[11.9]
Women									
Desktop computer	61.5	58.8	52.5	61.4	55.7	59.0	63.2	63.5	62.4
Laptop computer	68.7	67.6	71.6	60.5	69.7	71.7	71.4	66.7	67.6
Tablet computer	[12.9]	16.5	[10.8]	[10.8]	[14.0]	15.5	[14.5]	14.6	15.1
Smartphone	[18.9]	16.6	[17.9]	[17.3]	23.5	21.5	26.2	19.1	21.5
Other (including TV)	[9.7]	[7.9]	[7.3]	[5.8]	[10.4]	[8.1]	[8.4]	[6.4]	[5.2]
<i>Unweighted N</i>									
<i>Men</i>	143	308	254	301	292	396	249	542	354

<i>Women</i>	<i>169</i>	<i>363</i>	<i>333</i>	<i>338</i>	<i>322</i>	<i>454</i>	<i>279</i>	<i>618</i>	<i>405</i>
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Base: those who have used the internet in the past three months

Table 18. Reasons for internet use by Government Office Region at Wave 6.

	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West
Men									
Email, research, etc.	55.1	52.1	53.0	62.6	55.2	65.8	63.9	70.8	67.8
Finances	26.8	33.5	28.7	39.5	31.6	40.6	45.4	42.9	39.1
Networking/gaming	[18.8]	23.8	17.3	28.4	22.1	23.6	29.2	23.3	24.5
Selling, uploading, other	[12.8]	15.1	[11.9]	19.5	16.1	18.0	19.9	22.1	19.3
Job searching/applications	[7.0]	[5.2]	[3.6]	[6.6]	[7.0]	[7.8]	[9.9]	[6.1]	[7.7]
Women									
Email, research, etc.	44.2	50.2	50.4	53.0	44.8	60.5	50.9	60.8	60.5
Finances	21.5	23.5	24.1	27.5	22.4	31.0	25.2	32.7	29.3
Networking/gaming	[17.9]	27.4	25.1	26.2	22.5	30.3	28.0	29.5	27.4
Selling, uploading, other	[7.3]	10.0	[8.9]	11.1	11.2	11.4	11.3	12.0	10.8
Job searching/applications	[3.3]	[4.6]	[6.7]	[5.5]	[5.6]	[6.8]	9.9	8.3	[6.8]
<i>Unweighted N</i>									
<i>Men</i>	<i>276</i>	<i>561</i>	<i>473</i>	<i>507</i>	<i>537</i>	<i>605</i>	<i>403</i>	<i>805</i>	<i>559</i>
<i>Women</i>	<i>359</i>	<i>665</i>	<i>634</i>	<i>628</i>	<i>642</i>	<i>729</i>	<i>525</i>	<i>990</i>	<i>659</i>

Finally, Table 18 looks at reasons for internet use by GOR. Among both men and women, those in northern areas of England (the North East, North West and Yorkshire and the Humber) are the least likely to use the internet for purposes such as email and research, and those in the South East and South West are the most likely to use the internet for these reasons. The percentage of people using the internet for banking and finances is highest among men in London and the South East and women in the South East. Both men and women in the North East use the internet for financial reasons the least (27 per cent and 21 per cent, respectively, compared with 43 per cent and 33 per cent of men and women, respectively, in the South East of England). The highest rates of searching and applying for jobs online are seen among both men and women in London (10 per cent for each).

Internet use by urban and rural identifiers

Tables 19 to 22 show internet use by rural identifiers. The sample is divided into those whose locations can be described as urban, a town or fringe dwelling, a village, or a hamlet or isolated

dwelling. Due to smaller sample sizes among those in less populated areas, as well as the smaller number of respondents using the internet less frequently (as opposed to both frequently and never) the two-category version of the internet frequency variable is used in this section of the report.

Base: all wave 6 ELSA respondents

Table 19. Frequency of internet use by urban/rural indicator at wave 6.

	Urban	Town/fringe	Village	Hamlet/isolated dwelling
Men				
At least once a week to once a day	69.9	72.8	77.9	74.1
Less than once a week to never	30.1	27.2	22.1	25.9
Women				
At least once a week to once a day	58.5	59.1	65.6	68.9
Less than once a week to never	41.5	40.9	34.7	31.1
<i>Unweighted N</i>				
<i>Men</i>	<i>2808</i>	<i>472</i>	<i>450</i>	<i>176</i>
<i>Women</i>	<i>3547</i>	<i>636</i>	<i>532</i>	<i>198</i>

Table 19 shows both men and women in more rural locations are more likely to use the internet between once a week and once a day than those in more densely populated areas. There is a graded relationship between increasing rates of both men and women using the internet frequently and decreasing area population density.

Table 20 shows locations of internet access by urban and rural identifiers. Again, internet access from home is commonly observed among all groups of people. Unlike the previous section, which showed gradient associations between accessing the internet from work and both increasing age and wealth quintile, there is no real observable trend in accessing the internet from work on the basis of an individual's type of location. However, both men and women from hamlets and isolated dwellings are the most likely to report accessing the internet from the houses of others (32 per cent and 25 per cent, respectively) as well as on the move (36 per cent and 22 per cent, respectively).

Base: those who have used the internet in the past three months

Table 20. Places of internet use by urban/rural indicator at wave 6.

	Urban	Town/fringe	Village	Hamlet/isolated dwelling
Men				
Home	97.8	99.1	97.7	100.0
Work	36.7	33.0	29.5	[41.6]
Other people's houses	19.9	18.9	21.2	[31.9]
On the move	27.1	28.1	23.7	[35.6]
Other (including place of education)	13.0	[14.6]	[12.8]	[11.7]

Women				
Home	97.9	98.3	99.0	98.5
Work	31.8	27.7	33.6	[31.6]
Other people's houses	19.6	[18.8]	18.6	[25.2]
On the move	19.6	14.5	18.9	[21.7]
Other (including place of education)	8.4	[8.6]	[7.3]	[8.3]
<i>Unweighted N</i>				
<i>Men</i>	<i>2005</i>	<i>358</i>	<i>356</i>	<i>132</i>
<i>Women</i>	<i>2328</i>	<i>431</i>	<i>386</i>	<i>146</i>

Table 21 looks at the percentage of people accessing the internet via different devices on the basis of whether they live in urban or rural locations. The highest percentages of both men and women accessing the internet from laptops, tablets and smartphones is observable among those living in hamlets and isolated dwellings.

Base: those who have used the internet in the past three months

Table 21. Devices for internet use by urban/rural indicator at wave 6.				
	Urban	Town/fringe	Village	Hamlet/isolated dwelling
Men				
Desktop computer	70.1	69.5	67.7	67.5
Laptop computer	66.7	67.0	63.4	73.2
Tablet computer	16.8	[10.7]	[10.9]	[21.6]
Smartphone	29.1	29.6	30.8	[45.4]
Other (including TV)	12.8	[12.0]	[7.0]	[9.9]
Women				
Desktop computer	59.4	60.1	64.4	59.5
Laptop computer	68.5	67.6	67.4	71.8
Tablet computer	14.5	[11.5]	[13.7]	[17.5]
Smartphone	21.0	18.3	16.2	[23.6]
Other (including TV)	8.3	[6.0]	[3.5]	[6.6]
<i>Unweighted N</i>				
<i>Men</i>	<i>2001</i>	<i>358</i>	<i>354</i>	<i>133</i>
<i>Women</i>	<i>2327</i>	<i>431</i>	<i>386</i>	<i>146</i>

Finally, table 22 shows reasons for internet use by whether the individual lives in an urban or rural location. Those in more rural locations (villages or hamlets and isolated dwellings) are the most likely to report using the internet for email and research. Ten per cent more men and women in hamlets and isolated dwellings report using the internet for financial reasons than in urban areas, possibly reflecting the reduction in physical access to banking services among these groups. Over a quarter of men in hamlets and isolated dwellings report using the internet for selling and uploading, compared with 18 per cent or less of men from all other area types. Finally, men from

the most rural locations are the most likely to report using the internet for job searching and applications, but this observation is not repeated among women.

Base: those who have used the internet in the past three months

Table 22. Reasons for internet use by urban/rural indicator at wave 6.

	Urban	Town/fringe	Village	Hamlet/isolated dwelling
Men				
Email, research, etc.	60.1	63.2	69.2	65.2
Finances	36.6	35.9	42.7	46.1
Networking/gaming	24.7	20.8	21.8	[18.8]
Selling, uploading, other	17.9	13.7	17.6	[25.8]
Job searching/applications	6.8	[5.2]	[6.4]	[9.9]
Women				
Email, research, etc.	51.8	57.3	61.7	63.5
Finances	26.0	27.8	32.6	35.5
Networking/gaming	26.7	28.6	26.0	[24.8]
Selling, uploading, other	10.7	10.0	11.9	[10.3]
Job searching/applications	7.0	[5.6]	[6.4]	[3.0]
<i>Unweighted N</i>				
<i>Men</i>	3431	563	531	211
<i>Women</i>	4269	729	611	233

Internet use by index of multiple deprivation

The final set of tables presented within this section of the report look at trends in internet use by area defined by an index of multiple deprivation (IMD). Here, the area scores generated by the index are divided into quintiles.

Base: all wave 6 ELSA respondents

Table 23. Frequency of internet use by index of multiple deprivation score at wave 6.

	Least deprived	2 nd	Middle quintile	4 th	Most deprived
Men					
At least once a week to once a day	82.3	76.0	70.2	64.7	51.9
Less than once a week to never	17.7	24.1	29.8	35.4	48.1
Women					
At least once a week to once a day	69.6	63.6	58.5	52.9	45.3
Less than once a week to never	30.4	36.4	41.5	47.1	54.7
<i>Unweighted N</i>					
<i>Men</i>	983	1046	802	623	423
<i>Women</i>	1230	1263	976	845	558

Table 23 shows a clear gradient relationship between frequent internet use and the IMD for both men and women aged 50 and over. Just over half of men in the most deprived areas use the internet frequently, compared with over four-fifths of men in the least deprived areas. Less than half of women in the most deprived areas use the internet frequently, compared with around 70 per cent of women in the least deprived areas.

There are no particularly strong associations apparent between location of internet use and IMD. Both men and women in the least deprived areas are slightly more likely to report using the internet at home than those in more deprived areas, although the proportion is high (at least 96 per cent) for all groups. Both men and women in less deprived areas are more likely to access the internet from places of work than those in more deprived areas, although again the differences are not great. Those in the most deprived areas are the least likely to report accessing the internet from other people's houses and on the move.

Base: those who have used the internet in the past three months

Table 24. Places of internet use by index of multiple deprivation score at wave 6.

	Least deprived	2 nd	Middle quintile	4 th	Most deprived
Men					
Home	99.4	97.8	98.7	96.2	96.8
Work	38.8	34.6	34.6	34.6	32.3
Other people's houses	21.2	21.9	21.9	17.5	[15.2]
On the move	33.0	26.8	25.2	23.8	[19.7]
Other (including place of education)	13.7	14.9	14.5	[10.0]	[7.7]
Women					
Home	99.0	98.1	98.4	97.6	95.6
Work	33.5	32.6	30.0	32.2	26.7
Other people's houses	21.7	22.4	15.7	18.4	[16.2]
On the move	22.2	20.6	13.9	20.3	[12.5]
Other (including place of education)	8.5	8.6	[6.3]	[9.5]	[8.8]
<i>Unweighted N</i>					
<i>Men</i>	983	1046	802	623	423
<i>Women</i>	1230	1263	976	845	558

Table 25 shows a linear association between IMD quintile and the use of desktop computers, with desktop computer use more commonly reported among both men and women from less deprived areas. However, there is little evidence of an association between IMD and laptop use, with a relatively similar percentage of men and women in each IMD quintile accessing the internet via a laptop computer.

Base: those who have used the internet in the past three months

Table 25. Devices for internet use by index of multiple deprivation score at wave 6.

	Least deprived	2 nd	Middle quintile	4 th	Most deprived
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Men					
Desktop computer	75.5	68.0	70.0	67.2	60.7
Laptop computer	67.8	67.6	65.6	63.8	67.0
Tablet computer	19.0	14.3	15.6	[10.9]	[17.2]
Smartphone	33.9	29.0	33.4	23.7	24.2
Other (including TV)	10.9	11.1	12.6	[12.0]	[15.1]
Women					
Desktop computer	63.3	62.2	59.4	57.4	50.4
Laptop computer	68.8	67.6	65.2	71.6	70.1
Tablet computer	18.3	14.3	12.5	12.7	[8.1]
Smartphone	22.4	21.3	17.4	19.9	17.9
Other (including TV)	[6.2]	[6.8]	[7.7]	[8.7]	[8.1]
<i>Unweighted N</i>					
<i>Men</i>	<i>811</i>	<i>802</i>	<i>578</i>	<i>408</i>	<i>224</i>
<i>Women</i>	<i>925</i>	<i>886</i>	<i>643</i>	<i>516</i>	<i>289</i>

Finally, table 26 shows reasons for internet use by IMD quintile. Among both men and women, there is a large decrease in the percentage of people using the internet for the most popular reasons (email, research, etc.) as deprivation levels increase. Similarly, among both men and women, the percentage of people using the internet for financial reasons decreases as deprivation increases. While the percentages of men and women using the internet for gaming and networking and selling and uploading decreases as deprivation increases, there are smaller differences in the percentages of people reporting using the internet for these reasons between the most and least deprived areas.

Base: those who have used the internet in the past three months

Table 26. Reasons for internet use by index of multiple deprivation score at wave 6.					
	Least deprived	2 nd	Middle quintile	4 th	Most deprived
Men					
Email, research, etc.	71.2	67.2	61.1	56.8	42.5
Finances	46.9	43.0	37.2	29.3	22.2
Networking/gaming	26.2	23.2	26.0	22.1	20.2
Selling, uploading, other	19.6	19.4	19.1	15.8	12.1
Job searching/applications	5.8	6.6	7.5	8.4	[5.3]
Women					
Email, research, etc.	65.0	58.2	52.9	48.8	36.1
Finances	34.8	30.8	23.2	23.0	19.5
Networking/gaming	31.4	25.9	25.0	27.3	21.9
Selling, uploading, other	12.8	11.0	11.0	9.9	7.6
Job searching/applications	7.6	6.4	5.3	6.3	7.3
<i>Unweighted N</i>					
<i>Men</i>	<i>1148</i>	<i>1239</i>	<i>979</i>	<i>768</i>	<i>567</i>
<i>Women</i>	<i>1408</i>	<i>1482</i>	<i>1169</i>	<i>1013</i>	<i>722</i>

5. The relationship between internet use and physical access to services

The wave 6 ELSA data provide a set of variables asking respondents if they have trouble accessing a total of ten different services. The Methods section of the report describes these variables in detail. For the purpose of this section of the report, tables presented use a binary variable depicting whether or not respondents have difficulty in accessing at least one of the listed services, or if they have no difficulties accessing any.

Base: all wave 6 ELSA respondents

Table 27. Frequency of internet use by difficulty of access to services at wave 6 (column per cent)
[row]

	No difficulty accessing services	Has difficulty accessing at least one service
Men		
At least once a week to once a day	77.8	64.7
Less than once a week to never	22.2	35.3
Women		
At least once a week to once a day	69.9	47.4
Less than once a week to never	30.1	52.6
<i>Unweighted N</i>		
<i>Men</i>	2496	729
<i>Women</i>	2992	439

Table 27 shows that internet use daily or almost daily is more commonly observed among those with no difficulty in physically accessing services than among those with difficulty accessing at least one service (78 per cent with no difficulty compared with 65 percent with difficulty for men and 70 per cent compared with 47 for women).

Base: those who have used the internet in the past three months

Table 28. Places of internet use by difficulty of access to services at wave 6.

	No difficulty accessing services	Has difficulty accessing at least one service
Men		
Home	98.2	97.1
Work	39.0	29.5
Other people's houses	21.0	20.5
On the move	29.4	26.2
Other (including place of education)	13.2	16.2
Women		
Home	98.2	99.3
Work	35.9	23.8
Other people's houses	21.1	15.9
On the move	21.8	12.5
Other (including place of education)	8.3	9.5

Unweighted N

<i>Men</i>	1969	495
<i>Women</i>	2276	483

Table 28 shows places of internet use by difficulty in accessing services. Differences in locations of internet use on this basis appear to be small. For both men and women, the greatest observable difference is with use of the internet at work, which might be expected if we consider that those with difficulty in accessing services are also those more likely to be out of work due to disability or illness. There is a greater difference in the percentage of women reporting internet use outside of the home (except for work) on the basis of difficulty accessing services than men.

Base: those who have used the internet in the past three months

Table 29. Devices for internet use by difficulty of access to services at wave 6.

	No difficulty accessing services	Has difficulty accessing at least one service
Men		
Desktop computer	69.3	70.5
Laptop computer	68.2	64.8
Tablet computer	15.7	17.3
Smartphone	32.8	28.7
Other (including TV)	12.5	11.6
Women		
Desktop computer	61.7	56.2
Laptop computer	68.8	68.9
Tablet computer	14.7	10.9
Smartphone	22.4	16.8
Other (including TV)	8.1	4.7
<i>Unweighted N</i>		
<i>Men</i>	1964	495
<i>Women</i>	2276	482

Table 29 shows devices of internet use by difficulty in accessing services. As in the previous table, the differences in percentages of women using devices other than laptops are larger than the differences in percentages of men, on the basis of having difficulty accessing services, suggesting mobility issues have a larger impact on women's internet use than men's.

Base: those who have used the internet in the past three months

Table 30. Reasons for internet use by difficulty of access to services at wave 6.

	No difficulty accessing services	Has difficulty accessing at least one service
Men		
Email, research, etc.	79.8	66.4
Finances	51.1	39.3
Networking/gaming	31.7	26.9
Selling, uploading, other	23.4	22.5
Job searching/applications	8.5	9.9

Women		
Email, research, etc.	73.3	50.7
Finances	40.0	24.0
Networking/gaming	36.8	26.0
Selling, uploading, other	15.1	10.2
Job searching/applications	10.4	5.8
<i>Unweighted N</i>		
<i>Men</i>	<i>2511</i>	<i>736</i>
<i>Women</i>	<i>3027</i>	<i>873</i>

Table 30 shows reasons for internet use by difficulty in accessing services. All reasons for internet use are reported more among those without difficulty accessing services than those with, for both men and women.

6. Cohort changes in internet use over a 10 year period

The following section uses longitudinal data from six waves of ELSA to examine whether internet use changes over time differently for members of different age cohorts. For each cohort, the probability of frequent internet use is derived over the ten year period spanning 2002-03 to 2012-13. An individual's age cohort is defined on the basis of their age group at the start of the ELSA period (wave 1, with data collected during 2002-03) and there are seven cohorts in total (aged 50-54, 55-59, 60-64, 65-69, 70-74, 75-79 and 80+ at the first observation). Details of the data and sample can be found in the Methods section of the report, and the data are weighted using wave 1 weights.

Multilevel growth curve models are used to show patterns of internet use for each age cohort over the ten year study period. Random effects models allow us to examine whether or not internet use differs significantly at the start of the data period (2002-03) for each age cohort, and whether or not the rate of change in frequent internet use between 2002-03 and 2012-13 differs significantly on the basis of age cohort. The models also examine differences in internet use on the basis of gender and wealth alongside cohort.

Figure 1. Frequent internet use by age cohort over a 10 year period.

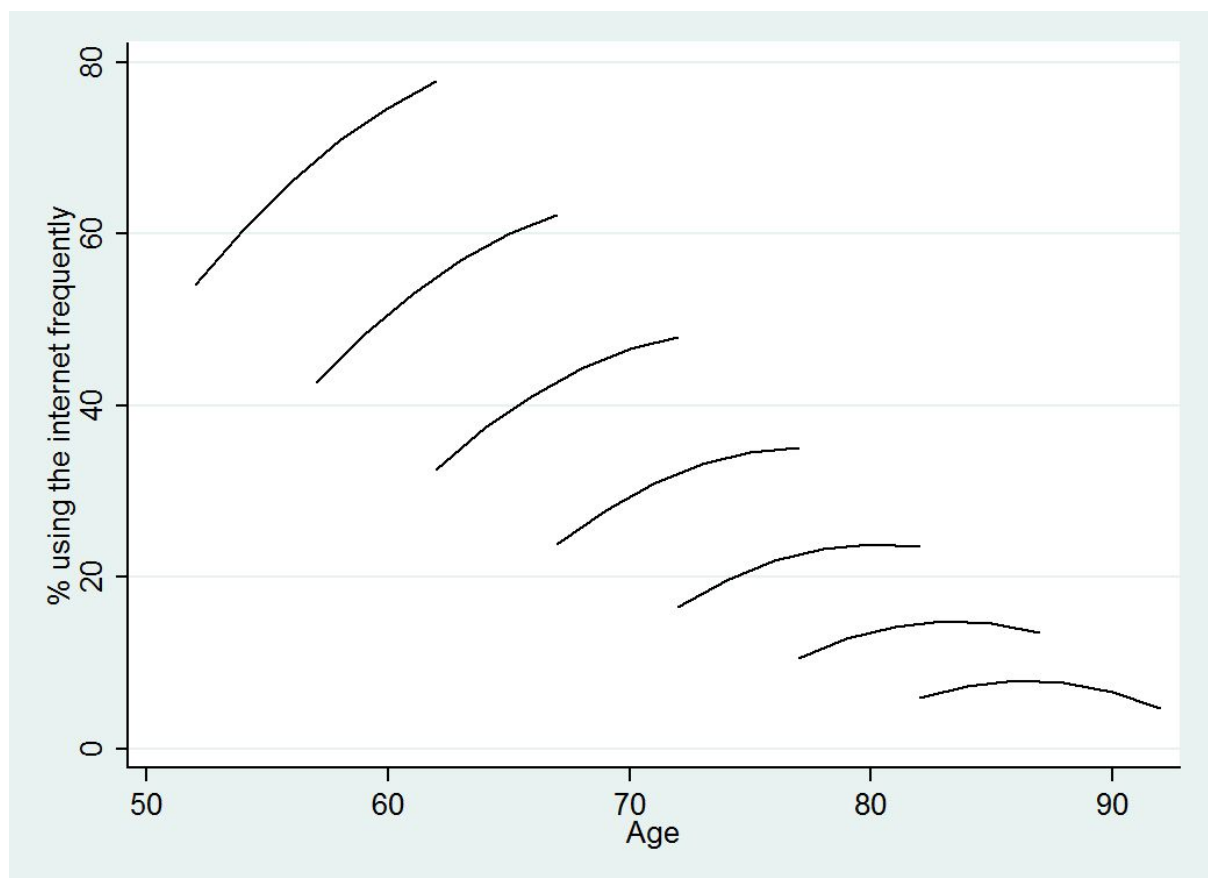


Figure 1 shows more recent cohorts are using the internet frequently more than earlier cohorts. The start of each cohort line shows the percentage of people using the internet at wave 1

(2002-03), and the final point of each line shows the percentage of people using the internet at wave 6 (2012-13). The lines clearly demonstrate the graded relationship between higher levels of internet use and more recent cohorts. As well as more recent cohorts displaying higher levels of frequent internet use, Figure 1 shows that over the ten year study period, uptake of frequent internet use occurs at a greater rate among more recent cohorts (demonstrated by the gradient of each cohort's line). Additionally, among the earlier cohorts the initial slow increase in frequent internet use over time changes to a decline towards the end of the study period. The graph suggests that this point of decline happens earliest among the oldest cohort, and that the rate of decline is steepest among the oldest group. There is a gradient pattern of lessening decline, both in terms of frequent internet use and rate of decline of internet use, as the cohorts become younger.

Importantly, Figure 1 shows that for a given age the large differences in frequent internet use by age cohort do not diminish over time, such that the lines are stacked above each other rather than joining or crossing. Imagine a line drawn up from age 72 to illustrate this. At this point the earliest cohort (aged 70 to 74 when first observed) had a rate of frequent internet use of about 18 per cent, compared with a rate of about 33 per cent for the next cohort (aged 65 to 69 when first interviewed) and a rate of almost 50 per cent for the cohort that followed that (aged 60 to 64 when first interviewed).

Figure 2. Frequent internet use by age cohort and gender over a 10 year period.

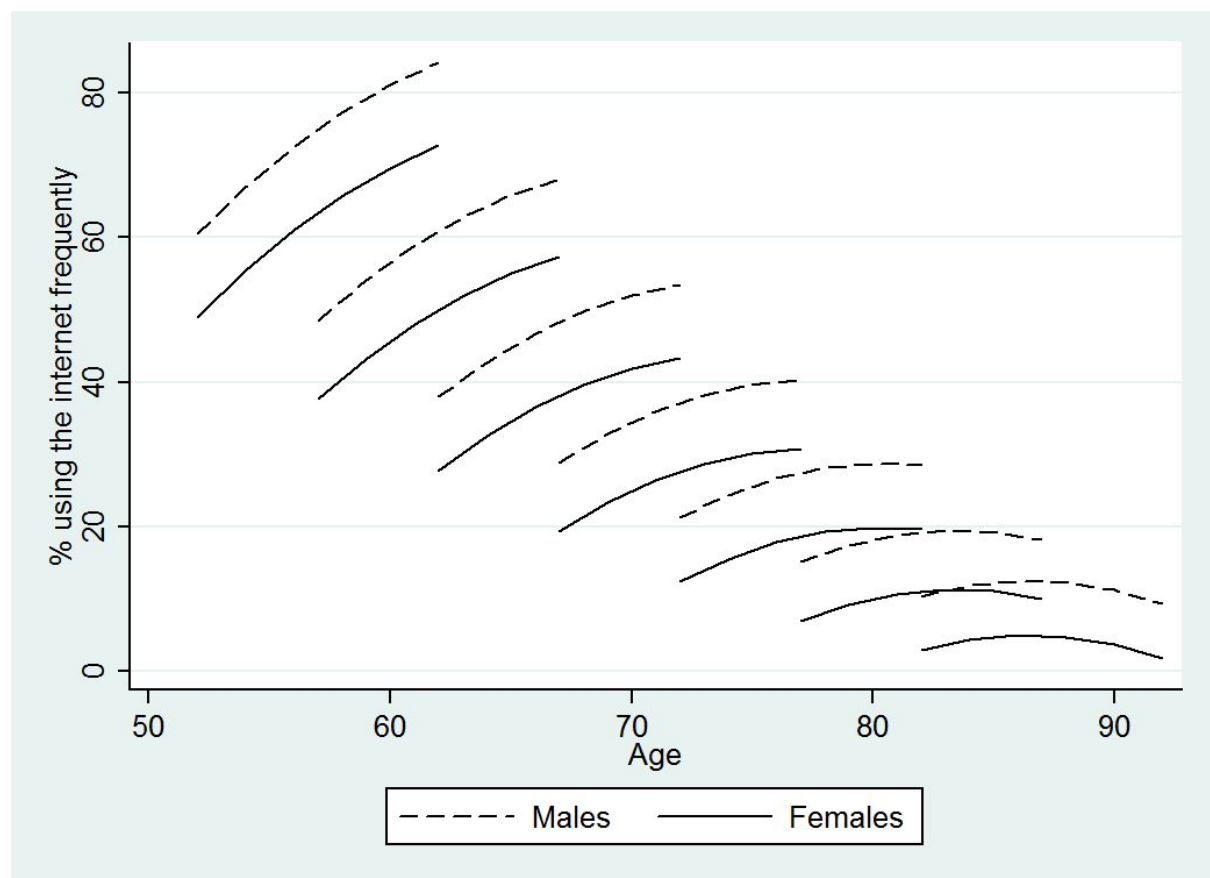
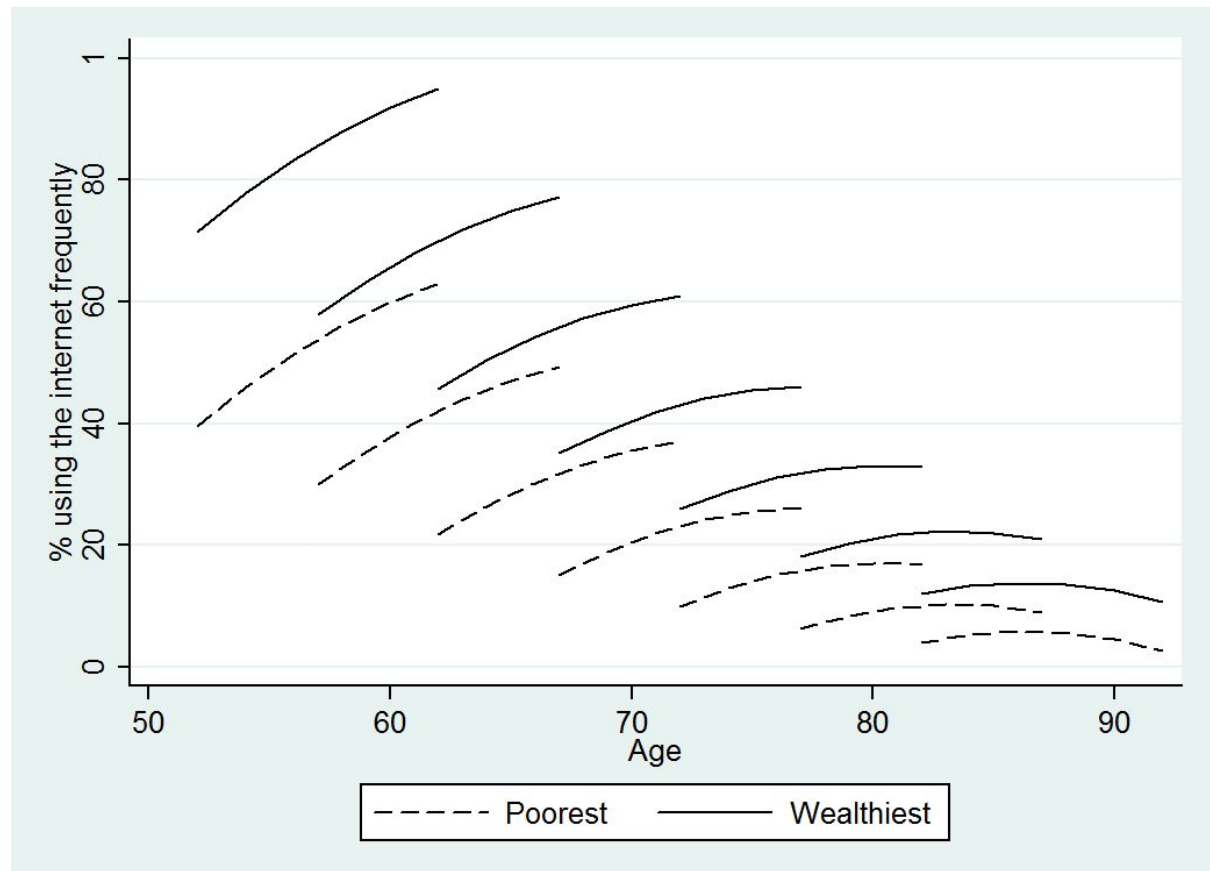


Figure 2 appears to show the same overall pattern for both men and women in frequent internet use as that shown in Figure 1. The separate lines for men and women show that, although men

are consistently using the internet more frequently, the rate of uptake of frequent internet use, as well as the rate of decline in older cohorts, follows the same pattern for both men and women.

Figure 3 shows the relationship between internet use and age cohort on the basis of wealth. Here, the richest wealth category is inclusive of those individuals belonging to the highest two wealth quintiles examined in previous sections of the report, and the poorest category is comprised of individuals in the lowest three quintile groups.



Again, Figure 3 shows more recent cohorts use the internet more frequently than earlier cohorts, and increase frequent internet use uptake at a faster rate. Although the patterns over time appear similar for both optimal and suboptimal groups, the graph clearly demonstrates an association with wealth and greater internet use. The youngest cohort within the poorest wealth category display average levels of frequent internet use in 2002 similar to those of the richest wealth group cohort at age 60-64.

Table 31 provides the coefficients for the growth models specified to produce Figures 1 to 3, which suggests the more recent cohorts of older adults use the internet more frequently and, over the past decade, uptake of frequent internet use has occurred at a faster pace among more recent age cohorts than older cohorts. The negative values of the coefficients for age cohort reflects the less frequent internet use among the earlier cohorts demonstrated by Figure 1, and the positive wave coefficients demonstrate the increase in frequent internet use over time, suggesting that over the past ten years older people have started to use the internet on a more frequent basis.

The negative value of the interaction between wave and age cohort suggests uptake of frequent internet use is higher among the more recent cohorts, and again this is reflected in Figure 1.

Table 31. Growth curve model of frequent internet use by age cohort, gender and wealth.

	Model 1	Model 2	Model 3
Fixed effects			
Cohort	-0.051***	-0.055***	-0.050***
Wave	0.163***	0.163***	0.160***
Wave*cohort	-0.002***	-0.002***	-0.002***
Female		-0.185***	
Female*cohort		-0.185***	
Optimal wealth		0.001	
Optimal wealth*cohort			0.734***
Intercept	0.238***	0.274***	0.212***
Random effects			
Within-person	0.162***	0.160***	0.148***
Intercept	-0.013***	-0.013***	-0.013***
Slope	0.005***	0.005***	0.005***

Model 2 examines patterns of internet use by men and women separately, and corresponds to the graph in Figure 2. The coefficient for females is negative and significant, telling us that women are less likely to be frequent internet users than men. However, the interaction between sex and age cohort is not significant, which suggests that there are no real differences in the gender patterns of frequent internet use across age cohorts.

Model 3 considers the relationship between internet use, age cohort and wealth. The wealth coefficient is positive and significant, demonstrating those who are in the richest two wealth quintiles are more likely to be frequent internet users, as is reflected in Figure 3. The interaction between wealth and age cohort, however, is negative, suggesting that the wealth differences in internet use lessen among older cohorts.

7. The relationship between internet use and wellbeing

The final section of the report focuses on six aspects of wellbeing: depression (measured using CES-D score), quality of life, satisfaction with life, social isolation, loneliness and social engagement. Details of these wellbeing variables were outlined in the Methods section of the report. However, in order for easy interpretation of the tables below, it is worth noting that a negative depression, satisfaction with life, social isolation and loneliness coefficient signifies beneficial associations between internet use and wellbeing, while beneficial effects on quality of life and social engagement are signified by positive coefficient values.

Table 32 shows the results of models regressing frequency of internet use on wellbeing. All models are linear regressions, with the exception of the model of the binary variable of loneliness which is a logistic regression model. Frequent internet use is defined as those using the internet every day, almost every day or at least once a week. Non-frequent internet use is defined as using the internet less than weekly to never. Again, less frequent users are combined with those who report that they never use the internet due to low numbers. All models control for gender, age, wealth quintile and self-rated health. Self-rated health is measured using the five-point Likert scale self-rated health variable described in the Methods section of the report. All models are weighted using the wave 6 cross-sectional weight.

Base: all wave 6 ELSA respondents

Table 32. Regression of frequent internet use (daily or almost daily) on wellbeing (models control for gender, age, wealth and self-rated health).

CES-D	-0.07 (0.02)***
Quality of life	0.15 (0.07)*
Satisfaction with life	0.10 (0.06)
Social isolation	-0.03 (0.02)
Loneliness	0.81 (0.06)**
Social/civic engagement	0.04 (0.01)*

The models presented in Table 32 show those who use the internet frequently see depression scores 0.07 lower than those who use it infrequently or not at all, and this association is significant. Frequent internet users also have quality of life scores 0.15 higher than those who do not use it frequently, and social and civic engagement scores 0.04 higher. However, frequent internet users have significantly higher loneliness than those who use the internet less frequently, with a 0.04 difference in scores.

Table 33 presents the results of regression models of reasons for internet use on the six wellbeing outcomes of interest. Models are specified as in Table 32, controlling for gender, age, wealth and self-rated health. All models are linear regressions, with the exception of the model of the binary variable of loneliness which is a logistic regression model. The models are run only on the sample of individuals who class themselves as frequent internet users which, as in the previous model, are those who use the internet every day, almost every day or at least once a week. Again, all models are weighted using the wave 6 cross-sectional weight.

Base: those who have use the internet at least one a week

Table 33. Regression of reasons for internet use on wellbeing (models control for gender, age, wealth and self-rated health).

CES-D	Email, research, etc.	-0.70 (0.34)*
	Finances	-0.03 (0.06)
	Networking/gaming	-0.01 (0.06)
	Selling, uploading, other	0.07 (0.07)
	Job searching/applications	0.28 (0.13)*
Quality of life	Email, research, etc.	3.41 (1.56)*
	Finances	0.23 (0.23)
	Networking/gaming	0.45 (0.23)
	Selling, uploading, other	-0.35 (0.28)
	Job searching/applications	-1.83 (0.45)***
Satisfaction with life	Email, research, etc.	-0.51 (1.92)
	Finances	0.13 (0.21)
	Networking/gaming	-0.19 (0.22)
	Selling, uploading, other	0.65 (0.26)*
	Job searching/applications	2.21 (0.42)***
Social isolation	Email, research, etc.	-0.58 (0.29)*
	Finances	0.11 (0.05)
	Networking/gaming	0.07 (0.05)
	Selling, uploading, other	-0.02 (0.06)
	Job searching/applications	0.33 (0.11)**
Loneliness	Email, research, etc.	0.71 (0.30)
	Finances	0.97 (0.08)
	Networking/gaming	1.12 (0.09)
	Selling, uploading, other	0.96 (0.09)
	Job searching/applications	1.64 (0.23)**
Social/civic engagement	Email, research, etc.	0.69 (0.15)***
	Finances	0.02 (0.04)
	Networking/gaming	0.07 (0.05)
	Selling, uploading, other	0.27 (0.06)***
	Job searching/applications	0.09 (0.08)

Using the internet for popular reasons, such as for email and research, is associated with significantly lower levels of depression, higher quality of life, lower social isolation and higher social and civic engagement, even after controlling for wealth and self-rated health. Those who use the internet for reasons such as email and research see depression scores 0.7 lower than those who do not. Similarly, their quality of life scores are 3.4 points higher, they observe over half a point lower social isolation, and see social and civic organisation scores 0.7 higher than those who do not report using the internet for these reasons.

Using the internet for selling and uploading is associated with better wellbeing in terms of social and civic engagement yet poorer satisfaction with life. Finally, using the internet for the purposes of job searching and applying for jobs is associated with significantly higher levels of depression, lower quality of life and life satisfaction and higher social isolation and loneliness. As the models here are cross-sectional associations, this may reflect lower wellbeing among those who are

unemployed yet would prefer to be working, rather than a specific effect of this particular type of internet use.

Conclusions

It has been well acknowledged that older people use the internet less often than the younger people, and that interventions designed to increase rates of internet use among older people have had limited success. The analyses presented within this report provide a useful insight into the internet behaviours of older people living in England. Previous research into the topic has been sparse and studies have not been representative of the older English population. However, the results discussed here complement some previous findings, such as the fact that older women use the internet less than older men, and that those in poorer social circumstances are less likely to use the internet than those with better circumstances.

The analyses reported here used ELSA data, which enabled exploration into the internet behaviours of older people on several levels. ELSA is a large dataset, and is nationally representative, allowing a substantive analysis of behaviour, rather than the qualitative analyses that have made up the majority of previous research. Additionally, the ELSA data, particularly at wave 6 (2012-13), contain a rich set of variables on internet behaviour, allowing us to look at specific behaviours beyond frequency of use, such as how and where the internet is accessed, as well as why older people choose to go online. The multidisciplinary nature of ELSA also allows us to look at these behaviours in relation to a variety of other factors, such as geographical region, indicators of disability and social disadvantage and various aspects of mental wellbeing. Finally, the longitudinal nature of ELSA allows us to look at how internet behaviours are changing over time and as people become older.

In terms of general internet use, this report shows that large differences in frequency of use exist on the basis of gender, age and wealth. Younger cohorts of older people use the internet far more frequently than older cohorts, and men of all age groups consistently use the internet more frequently than women. The analyses also demonstrate those with lower levels of wealth use the internet less frequently than those with higher levels of wealth, and again, across all levels of wealth, men are more likely to use the internet frequently than women. The longitudinal analysis presented showed that internet use among older people increased over time, but uptake of frequent internet use happened much faster among the more recent cohorts of older people compared with those in the oldest cohorts. These relationships exist for both men and women, and are independent of wealth.

The results also showed some regional variations in frequent internet use, with the North East of England having the lowest proportion of internet users and the south and east of England, including London, having the highest. Additionally, those living in cities are less likely to be frequent internet users than those in more rural locations, and people living in areas characterised by higher deprivation are also less likely to use the internet frequently when compared with those in less deprived areas. The lower internet use among people living in cities and in areas of deprivation reflect the initial findings that level of wealth is associated with internet use.

Frequent internet use was more commonly observed among older people without difficulty accessing services than among those with difficulty accessing one or more services. Again, this finding is likely to be related to the associations with wealth and internet use, as those

experiencing difficulties in accessing services are likely to be in poorer health and poorer social circumstances. Again, the relationship was the same for both men and women.

Finally, cross-sectional regression analyses, controlling for age, gender, wealth and self-rated health, showed that frequent internet use was significantly associated with better wellbeing in terms of lower levels of depression and higher quality of life. However, frequent internet use was also associated with increased feelings of loneliness.

Some associations were also found between the circumstances of older people and specific internet behaviours. Almost all internet users access the internet from home, and this finding persists across all age and wealth groups for both men and women. The second most commonly reported place of access is the workplace and, as might be expected, this is particularly true among younger age groups and higher wealth groups, with a noticeable decline in the proportion using the internet at work for both men and women once State Pension Age is reached. Those in higher wealth groups are more likely to be employed in sedentary occupations where computer use is a central part of the job role, compared with those in lower wealth groups who might be more likely to be working in manual types of employment. There is also a relationship between higher levels of wealth and accessing the internet while on the move, but, for both men and women, the proportion of people accessing the internet while on the move decreases rapidly with age.

The majority of people access the internet with either desktop or laptop computers, but the use of laptop computers falls with age at a much faster rate than the use of desktop computers. Other devices for internet use are much less commonly used, but again, when they are, the rate of use drops quickly as age increases for both men and women. This may be because younger older people have better access to knowledge of more modern devices to access the internet and therefore are more likely to access the internet by such means, or that such devices are less usable as people get older. Older age cohorts might have less knowledge about newer technologies, perhaps due to longer periods of retirement and a lower dependence on internet use prior to workforce exit. Mobile devices might also be more difficult to operate for older individuals in poorer health, such as those with disability limitations or poorer vision.

Among all age and wealth groups, the most commonly reported use of the internet is for activities such as email and research. All types of activity decrease with age and wealth for both men and women. Men are noticeably more likely to use the internet for finances than women, but women are more likely to report using the internet for networking and gaming than men.

The results presented within this report provide a useful insight into the internet behaviour of older people, an under-researched area. It is commonly acknowledged that older people in general use the internet less frequently than younger people, but little else is known about how and why older people use the internet and the impact internet use might have on factors affecting their wider lives, such as certain aspects of mental wellbeing. The association between internet use and better wellbeing demonstrates the importance of encouraging older people to use the internet, and the tables presented in sections 1 to 5 are useful in highlighting the individuals who are most at risk of being excluded from internet use; those who are the oldest, those who experience the lowest levels of wealth, in terms of overall wealth and regional characteristics, and

those with poorer health or higher rates of disability, demonstrated by means of whether or not the individual struggles to physically access key services.

While the analyses show internet use is less common among the oldest age groups, and the longitudinal analysis demonstrates that uptake of frequent internet use over the past ten years has been lowest and slowest among the oldest age cohorts, it is worth considering that these groups might have been excluded from internet use at a higher level than more recent cohorts of older people. The individuals who were already older at wave 1 of the study are likely to have been retired for some time from occupations, and occupations that were less dependent on internet use than those engaged in by more recent cohorts, and so may not have been encouraged to engage in internet use at any point in their lives. As internet use has become increasingly common across many domains of life, including the workplace, future cohorts of older people might be more likely to display higher levels of internet use than those participating in this study. However, the low levels of internet use at older ages point to an important source of social exclusion as internet access becomes more important for active citizenship.

References

- Dutton, W. H., Helsper, E. and Gerber, M. (2009), 'The Internet in Britain: 2009'.
- Friemel, T. N. (2014), 'The digital divide has grown old: Determinants of a digital divide among seniors', *New Media and Society*.
- Green, M. and Rossal, P. (2013), 'Digital inclusion evidence review', *Age UK Digital Inclusion Evidence Report*.
- Helsper, E. J. and Eynon, R. (2010), 'Digital natives: where is the evidence?' *British Educational Research Journal* **36**(3), 503–520.
- Hill, R., Beynon-Davies, P. and Williams, M. D. (2008), 'Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use', *Information Technology and People* **21**(3), 244–266.
- Morris, A., Goodman, J. and Brading, H. (2007), 'Internet use and non-use: Views of older users', *Universal Access in the Information Society* **6**(1), 43–57.
- Office for National Statistics (2014), 'Internet Access Quarterly Update 2014 Q1'.
- Selwyn, N. (2004), 'The information aged: A qualitative study of older adults' use of information and communications technology', *Journal of Aging Studies* **18**(4), 369–384.
- Sourbati, M. (2009), 'It could be useful but not for me at the moment: Older people, internet access and e-public service provision', *New Media and Society*
- Steptoe, A., Breeze, E., Banks, J. and Nazroo, J. (2013) 'Cohort Profile: The English Longitudinal Study of Ageing (ELSA)', *International Journal of Epidemiology*, **42**, 1640-1648
- Wei, L. (2012), 'Number matters: The multimodality of internet use as an indicator of the digital inequalities', *Journal of Computer-Mediated Communication* **17**(3), 303–318.