Cambridge Centre for Housing & Planning Research

Digital Poverty in the UK: a review of literature

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1. Executive Summary

Digital Poverty is increasingly recognised as a key aspect of the broader disadvantage experienced by many people within the UK. It is understood to be characterised by any combination of limited access to suitable internet-enabled devices, difficulties accessing and securing a stable and reliable internet connection, low levels of digital skills and confidence, and a lack of motivation to use the internet. Experiences of digital poverty are variable, and individuals may experience different levels of digital exclusion over time. It is clear that being unable to get online – or to use the internet frequently and in ways which enable the user to take advantage of a range of online opportunities – has detrimental effects at both an individual and a societal level (see Robinson et al., 2015; Holmes and Burgess, 2020).

This report brings together a range of academic and grey literature on digital poverty in order to provide a useful resource for policy makers in local and central government, as well as the third sector, to draw on in their efforts to tackle digital exclusion. Indeed, if digital poverty is to be addressed successfully, it is crucial to understand the factors underlying the issue, the scale of the problem, who is affected, and the challenges which must be overcome.

Drawing on relevant literature, the report sets out some key drivers of digital poverty before indicating some of the key factors that affect who experiences digital exclusion. While there are many important consequences associated with low levels of digital inclusion, this report focuses on the impacts of digital poverty on productivity and skills, as well as community and social infrastructure, as it seeks to reach beyond individual impacts in order to capture some of the broader societal impacts and roots of the issue. The report outlines some of the key challenges for overcoming digital exclusion, including affordability, infrastructural barriers, and fears around getting online. Some of the ways that digital technologies could be harnessed to address local needs, and the role of governance in addressing the issue (at a range of levels, from national to local) are also set out.

Drawing on the review of literature contained within this report, a series of policy recommendations have been compiled. These are set out here:

Governance and policy-making

- It is clear that a siloed approach to policy making poses a significant barrier to addressing digital inequalities. A more joined up approach which enables different

government departments to collaborate and work together to align their approach to tackling digital exclusion across different policy areas will be required.

- Local knowledge is important in ensuring that efforts to tackle digital poverty target the people who need support, and that this happens in the right way. Local authorities should be given the support they need to engage with their residents and to work with government, private sector and third sector partners to develop strategies which work at the local level.

- Public-private partnerships will be necessary to ensure that provision of digital services (specifically high quality broadband connections) reaches all communities, and avoids privileging the most financially well-off communities where potential for profit is highest.

Targeting responses

- There are variations in the levels of digital exclusion experienced in different places and by different demographic groups. Information on who is affected by digital exclusion should be better utilised in policy to target responses to those who need them most, and to adapt responses to people's needs.

Skills gaps

- There is a clear lack of digital skills in the UK. Providing opportunities for people to improve their digital skills and build their online confidence will be essential to filling the digital skills gap in the workforce. Given that the most disadvantaged children are more likely to be digitally excluded, every effort should be made to avoid further entrenching inequalities and ensure that those without access to the internet at home, or with limited opportunity to use it at home, are given additional opportunities to practice their digital skills and gain access to online opportunities.

Mitigating the impacts of digital exclusion

- Essential services should be easily accessible by everyone, regardless of whether or not they are digitally included. When undertaking changes to services or improving digital provision, care should be taken to ensure that this does not provide a further barrier to those unable to access digital services effectively. Offline provision should therefore be maintained for those who need it. Meanwhile, given that many people who are online have limited digital skills, online platforms should be designed with these people in mind,

and care should be taken to make webpages and apps as easy as possible to navigate and to understand.

Internet access as essential

- Digital inclusion is often treated as a 'nice-to-have' or as a luxury which people can manage without. This is despite an abundance of evidence outlining the detrimental impacts of digital exclusion on people's lives. Efforts should be taken to ensure that digital inclusion is treated as essential in policy. This could mean that access to an internet connection should be treated as a statutory right.

Poverty and digital exclusion

- There is a clear relationship between digital poverty and broader structural disadvantage. Efforts to tackle digital poverty should therefore recognise that addressing inequalities more broadly will be essential to ensuring that people have the opportunities needed to get online. As such, policy should recognise that, while initiatives which target a specific driver of digital poverty (such as those which address a lack of digital devices by distributing tablets and laptops) may be helpful in the short term, long term solutions to digital poverty need to pay greater attention to the societal contexts from which digital poverty emerges.

- It is clear that people on low incomes are at greater risk of digital poverty. Serious efforts should be made by the government – in collaboration with private and third sector organisations – to ensure that the costs of getting online are affordable. For those on the lowest incomes, this will likely mean that free or heavily subsidised provision of high-quality internet access is required to ensure those in the most disadvantaged socio-economic groups have access to online opportunities.

2. Introduction

2.1. What is digital poverty?

Digital poverty is understood to encompass a lack of (or limited) access to devices and internet connections, low levels of digital literacy, or low levels of motivation to get online. There are many factors which shape people's opportunities to use the internet, including age, gender and income. These, and a host of other factors, will be examined in this report. If digital poverty is to be effectively addressed, it is crucial to understand who is affected and in what ways.

Importantly, developments in understandings of digital inequalities have led to a shift away from thinking of a binary divide, between those who can access the internet and those who cannot, towards a conceptualisation of internet use as occurring along a continuum of exclusion/inclusion (Livingstone and Helsper, 2007). In line with this body of literature, this report therefore recognises that, even where people can get online, there may be differences in their means, quality, and frequency of internet access (Tsatsou, 2011). Furthermore, there is a growing body of literature which examines the ways in which different levels of internet use affect the tangible opportunities that individuals have access to (see Scheerder et al., 2017; van Deursen et al., 2017). It is therefore increasingly clear that digital poverty translates into disadvantage in other, non-digital, aspects of life.

A key focus of this report is on the relationship between digital poverty and socio-economic inequalities more broadly. Indeed, following Robinson et al.'s (2015) suggestion that digital exclusion ought to be considered a key aspect of social deprivation, this report draws together literature from across the social sciences to highlight that digital poverty cannot be understood in isolation from poverty and disadvantage more broadly.

2.2. The aims of this report

The existence of a 'digital divide' has been recognised within the social sciences and beyond since the 1990s (Tsatsou, 2011). Since then, a substantial body of literature assessing the causes and consequences of digital exclusion has emerged. This literature has already answered many important questions about digital poverty and setting out the nature of the problem is crucial in answering questions around how to address it. This report brings together existing literature on the topic of digital poverty into one useful resource. The report presents key aspects of existing understandings of digital poverty before concluding with a list of policy recommendations informed by these understandings.

2.3. Methodology

This report was compiled by reviewing academic and grey literature which deals with the issue of digital exclusion. Relevant pieces of literature were identified through previous research undertaken by the Cambridge Centre for Housing and Planning Research (CCHPR), which undertook this review, as well as through supplementary online searches. The exercise of reviewing literature was focused on highlighting key themes, rather than quantifying the problem of digital poverty. While statistics are included in the report where relevant, these are intended to illustrate important points, and the report is largely qualitative. The report is positioned as a broad overview of existing knowledge in the field, which captures current understandings of what digital poverty is, its drivers and impacts, as well as how digital poverty could be addressed through policy and the challenges which emerge in this regard. By setting out the key debates and findings from across the academic and grey literature, the report highlights key issues, and also indicates gaps in knowledge which demand attention.

3. The main drivers of digital poverty

Digital poverty is not the same for everyone. Holmes and Burgess (forthcoming) highlight that experiences of digital exclusion are closely related to the contexts of people's lives. As such, there are many diverse reasons as to why someone might not use the internet. However, access, skills and motivation are three factors which are widely recognised as important in shaping an individual's level of digital inclusion/exclusion. These are discussed in turn in the following.

3.1. Internet access

Data from 2021 suggests that 6% of households in the UK do not have access to the internet from home (Ofcom, 2021a). The quality of broadband services available in the UK is not uniform across the country, with approximately 5% of premises lacking access to superfast broadband (Hutton, 2021). For rural areas, the situation is worse, with almost 14% of premises unable to get broadband at superfast speeds (ibid.). Similarly, internet access via 4G is not available in all homes. While 98% of UK premises are covered by 4G signals (Ofcom, 2021b), a number of construction materials (including concrete) can block or limit signals in some buildings (Musa and Paul, 2019).

Location is, therefore, a key factor affecting the extent to which an individual is able to get access to a reliable internet connection. This is unlikely to change in the immediate future, particularly as the government has recently reduced its ambitions for the roll out of gigabit broadband (which has download speeds of 1GB per second): While initial plans aimed to ensure gigabit broadband was available to 100% of premises by 2025, the current plans have reduced this target to 85% of premises by the same year (Baker and Hutton, 2021).

However, this is not just an infrastructure-related problem. Even for those who live in areas where high-quality broadband connections and data signals are available, there are a number of factors that can prevent people from gaining access to the internet or from using it frequently. For example, a poor credit history can limit a person's ability to gain access to broadband and data contracts (Holmes and Burgess, 2021).

Importantly, broadband and data contracts can be unaffordable for people on low incomes (see section 4). For people who are unable to sign up to a monthly payment contract, pay-as-you-go tariffs may be an option, but these often end up costing more (Lucas et al., 2020). This can result in 'data poverty', whereby a person does not have access to enough data to meet their needs. This can in turn lead to restricted use of the internet, as people may feel

inclined to save their data for 'essential' uses, such as job-searching (Holmes and Burgess, 2021).

3.2. Device access

According to data from Ofcom (2021), 10% of internet users in the UK are only able to get online via a mobile phone. This matters because, when compared to laptops and desktop computers, smartphones have less to offer when it comes to digital inclusion. Napoli and Obar (2014) highlight that internet users who rely on smartphones are disadvantaged compared to those with access to a PC in terms of the opportunities they can access, as they may struggle to perform some functions and access some content using a phone. They argue that, as a result, internet users who only use smartphones have fewer opportunities to develop a wide range of digital skills.

Of course, the cost of purchasing a smartphone, tablet, laptop or desktop computer can be prohibitive. And even where a household does have access to one of these devices, this is not necessarily sufficient to meet their needs. For instance, at the beginning of the COVID-19 pandemic, Yates (2020) highlighted that this created a barrier to online learning for children who only had access to a device which had to be shared with others in their household. This underscores the fact that digital exclusion exists on a continuum, affecting people with varying levels of access, as well as those with no access at all, in different ways (Yates, 2020; Livingstone and Helsper, 2007).

3.3. Skills

It is estimated that just over 21% of the UK's population lack 'essential digital skills for life' (Lloyds Bank, 2021). These are defined by Lloyds Bank (2021) as comprising seven basic digital skills – including basic tasks such as turning on a computer, changing account passwords and connecting to wi-fi – in addition to at least one digital life skill in each of five categories, which include tasks involving communicating, making online transactions, using the internet to solve problems, finding and organising information, and being safe online. This creates a key challenge and highlights the fact that digital exclusion cannot be tackled solely through improved access to devices and internet connections.

In an analysis of 13 models of digital literacy, Iordache et al. (2017) argue that there is a need to embed understandings of digital skills and competencies in the broader social context, rather than focusing solely on the things that individuals can do on their own or for themselves. They suggest that, given the importance of social support in developing digital skills, there is a need to pay more attention to skills and competencies which have a

community-minded focus, treating activities such as offering help to others to aid them in getting online as an important aspect of digital literacy.

3.4. Motivation

The motivation to get online is a key factor in shaping the level of digital exclusion a person faces. The Good Things Foundation (2021) identifies four main motivational barriers among people who do not use the internet: (1) some non-users do not recognise the benefits of being online, and see no need to use the internet; (2) some non-users feel they need better support to get online (or to acquire an internet-enabled device); (3) some non-users consider the internet too 'complicated', often because they have low levels of digital literacy; and (4) some non-users say that they don't want to get online because it would be unaffordable.

Importantly, a lack of motivation to use the internet cannot be reduced to a simple decision to stay offline. Eynon and Helsper (2011) show that socio-economic factors play a role in shaping people's attitudes towards the internet and, as such, the contexts of people's lives are important in their decision to engage or disengage with the internet. They show that, while people do retain the agency to make an independent decision over whether or not to use the internet, the choices that people make in this regard should not be viewed in isolation from broader social structures. Indeed, Helsper (2017) argues that it is not sufficient to view motivation as an individual factor affecting digital exclusion, as the extent to which someone sees engaging with the internet as worthwhile is related to their frame of reference: people perceive their own situation relative to their social context – which may change over time – and compare their own situation to that of the people around them. As such, whether or not someone perceives the benefits of being online and thus is motivated to use the internet is related to the broader context of their life.

4. Who is affected by digital poverty?

As previously highlighted, digital poverty is an issue which affects many people, regardless of which indicator is used (from those lacking basic digital skills to those who have no access to the internet at home). However, it is important to note that there are several factors which affect people's likelihood of being digitally excluded. This section considers who is affected by digital poverty. It highlights that age, gender, ethnicity, education, income and housing circumstances are all factors which shape experiences of digital exclusion. This is of course not an exhaustive list of influencing factors.

4.1. Age

Age is widely known to be a key factor affecting a person's level of digital inclusion. Of the three million people who are completely offline in the UK, 67% are over 70 years old (Centre for Ageing Better, 2021). The ways in which older people use the internet also tend to be narrower than for younger groups (Davidson, 2018). There are a number of reasons for older people's digital exclusion: fears around online safety, health issues affecting people's ability to interact with devices, education levels and income levels have all been cited as contributory factors, such that Gallistl et al. (2020) argue that older people may not be digitally excluded specifically because of their age, but because of socio-economic factors, motivation, and their experiences and interests.

4.2. Gender

Several studies have considered the role of gender in digital exclusion. Data from the Office for National Statistics (2019) shows that there is a clear gender gap in digital exclusion among older people: In 2018, 51.3% of men over the age of 75 had used the internet within the last 3 months, compared with just 37.6% of women in the same age group. However, there was little difference in the percentage of men and women who had recently used the internet in younger age groups (ibid.). It has been argued that the gender gap in digital exclusion in the UK has decreased over time (Bunyan and Collins, 2013) and across much of Europe, there is thought to be little difference in the use of IT according to gender (Faulkner and Lie, 2007). Despite this, women are still less likely than men to be employed in the IT sector (Robinson et al., 2015). A possible reason for this can be found in Hargittai and Shafer's (2006) contention that women tend to perceive their own digital skills in a more negative light than men, leading to less confidence in using the internet. However, when discussing internet disengagement in the UK, Eynon and Helsper (2011) indicated that

gender did not in fact play a role in determining people's reasons for disengagement. Indeed, Bimber (2000) argues that any gender gap in digital access is rooted in socio-economic factors.

4.3. Ethnicity

Attention has also been paid to the role of race and ethnicity in digital exclusion. Using data from the Office for National Statistics (2020), Poole et al. (2021) observe that minority ethnic groups (particularly in older age groups) are more likely to be digitally excluded than those with white backgrounds. For instance, they highlight that, among 55-64 year olds in the UK, 83.6% of those with Asian or British Asian backgrounds had recently used the internet compared with 93.5% of those with white backgrounds. In a discussion of digital exclusion in the USA, Fairlie (2004) found that some of the difference in digital exclusion levels between ethnic groups was related to socio-economic factors. Fairlie (2004) also indicates that, among those for whom English is not a first language, the language barrier can contribute to digital exclusion. Importantly, understandings of how ethnic minority groups are affected by digital exclusion remain limited, and there is a need for improved data to capture this information (Stone, 2021).

4.4. Education

Education levels are also an important influence on a person's likelihood of being online. Helsper and van Deursen (2017) indicate that people who have higher levels of formal education are more likely to be online, have a good awareness of the internet, and are also more likely to have improved online capabilities compared with those who have lower levels of formal education. Crucially, in a discussion of the factors which influence the kinds of online activities people engage in, van Deursen et al. (2015) highlight that several studies have found education levels to be important in shaping the kinds of opportunities people access online. Indeed, when people with lower education levels and higher education levels have a similar level of access and skills, people with lower education levels are nonetheless less likely to use the internet for financial benefit or educational gain (ibid.)

4.5. Income

Given the costs involved with getting online (including paying for internet connections and devices), affordability is a key issue which can lead to digital poverty, particularly among low income groups (Reddick et al., 2020). Indeed, low income households are far less likely to have access to a home internet connection than higher income households: In Scotland, in 2014, 99% of households with an income of more than £40,001 had an internet connection,

compared with 60% of households with an income of £0-£6,000, and just 51% of households with an income of £6,001-£10,000 (ONS, 2019). Furthermore, people with higher incomes are likely to have a wider use of the internet than those with lower incomes (Helsper and Van Deursen, 2017), indicating that those on lower incomes are likely to access fewer online opportunities. Crucially, circumstances can change, and people can lose access to the internet for several reasons, including due to rising costs (Yates, 2020).

4.6. Disability

People with disabilities are less likely to be online than those who do not have a disability. In 2018, over 23% of disabled adults were internet non-users, compared with 6% of people without a disability (ONS, 2019). MacDonald and Clayton (2013) show that because digital technologies and online resources are usually designed for non-disabled people, those with disabilities may have to buy additional adaptive technologies in order to gain access to them, making digital inclusion more expensive. They highlight that the barriers to disabled people's digital inclusion are structural, and include issues with accessibility (due to the non-inclusive design of many technologies and online resources), a lack of skills, and poverty. Indeed, disabled people are more likely to be living in poverty than non-disabled people (Schwendel, 2020), and given that income is an important factor affecting digital exclusion (see section 4.5.), it follows that disabled people have a greater risk of being digitally excluded.

4.7. Location

As highlighted in section 3.1., location is an important factor in digital exclusion. However, it is important to note that this is not just a rural-urban divide, nor solely an infrastructural issue. There are regional differences in people's digital skills, with 83% of people in the South East able to demonstrate the seven basic digital skills (as discussed in section 3.3.) compared with 77% in Yorkshire and the Humber, and just 73% in Wales (Lloyds Bank, 2021). There are also differences in non-use of the internet. Data from 2020 shows that fewer than 6% of people in the South East are non-users, compared with over 11% in Northern Ireland and the North East of England (Education Technology, 2021). Some of this variation is thought to be due to demographic differences across the UK, as London's population is younger than the national average, but regional differences in socioeconomic factors are also an important consideration (ibid.).

4.8. Housing circumstances

One factor affecting digital poverty which has received comparatively little attention in the literature is people's housing circumstances. There are, however, some studies which highlight the relationship between housing inequality and digital poverty. In its 2014 Digital Inclusion Strategy, the UK government highlighted that people living in social housing are more likely to experience digital exclusion (Gov.uk, 2014). Indeed, Yates et al. (2014) highlight that social housing tenants are a key group affected by digital exclusion, particularly since those in the most disadvantaged socio-economic groups are likely to experience digital poverty and are also likely to live in social housing. They show that, even where social housing tenants are able to access the internet from home, they tend to use the internet less, and in a narrower way than expected, based on national averages (and taking age into account).

Housing circumstances themselves can have a direct impact on opportunities to get online. In a study of social housing residents' use of the internet during the COVID-19 pandemic, Ross and Clarke (2021) highlighted that housing can create an infrastructural barrier to the internet with, for example, old blocks of flats, or listed buildings, which lack high-speed connections (and therefore do not meet residents' needs) proving difficult and costly to retrofit. They also found that some residents struggled to work from home because of limited space and internet connection issues. This can be a particular issue in houses in multiple occupation (HMOs), for instance. In addition, there is evidence that some forms of housing, such as temporary housing, can make getting online difficult, as paying broadband installation fees may be unfeasible for people who may expect to move to a different address in the short term (Holmes and Burgess, 2021). Furthermore, mobile signal can be weak in some buildings (see section 3.1). The specific ways in which housing circumstances shape opportunities to get online demand further attention.

5. Impacts of digital poverty on productivity and skills

This section focuses on the relationship between digital poverty and employability. It highlights ways in which productivity and employability, finding work, securing higher pay and adapting to the changing future of work are all affected by digital exclusion.

5.1. Productivity and employability

Using digital tools can improve productivity in the workplace, and employers are increasingly looking for individuals with digital skills to fill vacancies. Considering that over three quarters of the UK economy is service-based, and basic digital skills are intrinsic to the majority of roles in these sectors (Cebr, 2018, p.18), developing basic digital skills can have an impact on the employability of individuals. However, over 11 million people, or 36% of the total workforce in the UK, lack 'essential digital skills for work' (Lloyds, 2021). This represents a clear ongoing challenge to productivity in the UK. Indeed, over 70% of large businesses, and almost 50% of SMEs based in the UK, report a shortage of digital skills (Times Higher Education Consultancy, 2021). Importantly, there are over 200,000 hard-to-fill vacancies across England, Wales and Northern Ireland, 30% of which are due to a lack of applicants possessing the required digital skills (ibid.)

5.2. Finding and securing a job

The internet has become an increasingly widespread tool for job hunting and recruitment (Cebr, 2018). In 2021, just under half (46%) of those with access to the internet had never used it to search for job opportunities or to apply for a job online (Ofcom, 2021a). The number of people in socio-economic group E (which includes casual and lowest grade workers and people who receive state benefits as their only income) who had access to the internet but had never used it to search for job opportunities or to apply for a job is strikingly higher at 75% (Ofcom, 2021a).

As indicated in section 3.2, some of those looking for job opportunities rely on a smartphone for their internet access. This can create difficulties as using a smartphone is often less than ideal for applying for jobs online or preparing a CV using a word-processing programme (Gerrard et al., 2014). It follows that not having access to a proper device and a stable, unlimited internet connection can be particularly problematic for those on Jobseeker's Allowance, given that they are expected to apply for between 10 and 15 jobs a week in order to remain eligible for this welfare payment (ibid.).

While it is clear that digital poverty can pose a significant barrier to finding work, even for those in work, a lack of digital skills can limit opportunities and have a negative impact on people's level of earnings: employers are generally willing to pay higher wages to people who are more productive and who use digital tools for work (Cebr, 2018). Robinson et al.'s (2015) research shows that individuals who use the internet more intensively and in more skilful ways stand a better chance of securing employment and tend to earn more money once employed.

5.3. Adapting to the changing future of work

Technological change and the move towards an increasingly digital economy will affect the future of work in terms of the quantity and quality of jobs available (Cebr, 2018). It is thought that technological change will result in a more digitalised workplace and, if workers do not have the necessary skills to adapt to new tasks and roles, they may risk losing their job (Cebr, 2018). Learning digital skills is a necessary step in preventing the occurrence of marginalised groups of individuals who cannot keep up with digitisation in the workplace. Ensuring that individuals foster and develop their digital capabilities will increase their employability by providing workers with the necessary skills to adjust to the new tasks and roles that technological change has created (Cebr, 2018).

In addition, with the shift to home and hybrid working, workers living in areas with insufficient digital infrastructure, and those who are unable to undertake work online from home due to a lack of digital skills, a lack of a suitable space to work or the lack of a dedicated device or reliable internet connection, face a particular disadvantage in the labour market. Similarly, businesses who are unable to pivot their working models due to poor connectivity may be at risk of reduced productivity (Local Government Association, 2021).

6. Impacts of digital poverty on community and social infrastructure

This section highlights the impacts of digital connectivity on social infrastructure as well as on communities. It first briefly defines social infrastructure and its role in creating communities. The role of the internet in providing social infrastructure is then set out, before the impacts of digital poverty on social infrastructure are highlighted.

6.1. What is social infrastructure?

Social infrastructure can be defined as a range of services and facilities that meet local needs and contribute towards a good quality of life (GLA, 2017). It is made up of places where people can gather for a common cause, or for no specific purpose at all (Schmidt and Power, 2021). Social infrastructure includes healthcare provision (e.g., GP practices, community pharmacists, dentists, opticians), educational facilities (e.g., schools, colleges, universities), community facilities (e.g., libraries, community centres, sport centres, places of worship), and green facilities (e.g., parks and public gardens). Social infrastructure is understood to play an important role in providing the necessary services to maintain and improve individual quality of life, as well as in developing strong and inclusive communities by providing opportunities to bring different groups of people together and thus contribute to social integration (GLA, 2017).

6.2. The role of internet in providing social infrastructure

Historically, social infrastructure was rooted in a physical space where tangible human connection could occur (Klinenberg, 2018). However, many of the activities provided by social infrastructure can now happen online. For example, chatting with friends and family, organising into social groups, engaging in political discourse and keeping up with the news are all elements of everyday offline life which can be carried over into the digital sphere (Thelwall, 2013). Some online activities mimic offline behaviour and serve as a new method for establishing a sense of connection (Schmidt and Power, 2021). Social networking sites represent a key platform for such activities, enabling individuals to engage in meaningful communication with one another, perhaps offering good wishes, sharing life updates, inviting each other to offline (or indeed, online) events, and creating new social meaning and memories (Chi, 2013).

Having access to online social infrastructure has become an integral part of many people's daily lives (including for essential activities such as booking a GP appointment). This is

particularly important for those who may find it difficult leave their homes, for example, because of a physical disability (Schmidt and Power, 2021), or due to other factors such as mental health issues, or caring responsibilities. Importantly, the necessity for online access to social facilities was exacerbated by the COVID-19 pandemic as many services and in-person social interactions moved online (for more detail, see section 10).

6.3. Impacts of digital poverty on community and social infrastructure and education

The increased shift of public and private services, everyday leisure activities, and education to online platforms means that digital inequality can have a significant impact not only on online activities, but also on offline outcomes and opportunities (Yates, 2020; Thelwall 2013). This section looks at some of these impacts.

A feeling of social isolation is recognised in Schmidt and Power's (2021) research among people who are not connected to the internet. They argue that 'without internet, individuals are isolated from family and friends, their local community, and the broader global context' (Schmidt and Power, 2021, p.385). While the internet has arguably shrunk the world for those with a high level of digital inclusion, enabling them to remotely access myriad opportunities for work, socialising and a range of other activities, 'for those without, it has meant a shrinking of the boundaries of what and who their world consists of' (ibid, p.385). There is a general assumption from friends, teachers, and employers that the internet is, and should be, consistently available. Thus, when it is not, people can feel isolated and excluded (Schmidt and Power, 2021).

Digital exclusion can limit a person's ability to find opportunities to engage with others and can leave people feeling excluded, as limited digital inclusion can weaken the ability to form and maintain a sense of interpersonal connectedness with one's community. It also can result in an inability to follow news stories or keep up to date with local events because more traditional means of communication (e.g., flyers, mailers, or the local paper) are increasingly shifting to virtual means. Social media is increasingly becoming a key platform for finding information about local events and situations (Schmidt and Power, 2021).

It is clear that digital poverty can also negatively impact upon education. Ofcom (2020) data on UK households found that approximately 9% of households with children lacked access to a laptop, desktop or tablet; 2% had no access to the internet; and 4% had only smartphone access. Given that the majority of children in the UK are online, this creates a clear disadvantage for those who do not have the same opportunities for digital inclusion as their peers. Although the impact of digital exclusion on education existed prior to the school

closures during the COVID-19 lockdowns in the UK, this is understood to have exacerbated the issue (Coleman, 2021; van de Werfhorst et al., 2020). As Coleman (2021, p.3) discusses, 'there are concerns that the move to remote education has led to inequalities in access to learning', with already disadvantaged children being most affected. This divide has various dimensions, including issues around access to devices and internet, digital skills, and external factors such as parental support, teacher skills and the learning environment (Coleman, 2021).

In addition, people who do not use the internet face additional obstacles in accessing health-care-related information and technologies (Watts, 2020), miss out on online upskilling and learning opportunities, and are unable to engage as fully as others in democratic participation, citizenship and wider social activities.

7. Challenges for addressing digital poverty

There are a number of barriers to reducing the levels of digital exclusion which are found across the UK. These challenges include social, economic and cultural factors, as well as barriers which stem from the ways in which digital poverty is treated within policy. Some of the key barriers are highlighted here.

7.1. Affordability

Affordability remains a key barrier to getting online and, as previously highlighted (see section 4.5), digital exclusion is particularly prevalent among people on low incomes. As well as limiting digital inclusion, not being able to afford a device or internet connection can add to the financial strains of poverty by limiting access to better deals which can be found online (Roscoe and Johns, 2021). As previously highlighted, where affordability is a problem, people may have to use pay-as-you-go data (which can work out more expensive than monthly contracts, but which does not require customers to commit to paying a monthly sum). This can in turn lead to people rationing their use of the internet in order to conserve their data (Holmes and Burgess, 2021), meaning that people have fewer opportunities to practice their digital skills, and may use the internet in a narrower way. Ensuring that affordable options are available for getting online and for using the internet in an unrestricted way – taking into account both device access and connectivity – will be needed in order to reduce digital poverty in the UK.

7.2. Fear of getting online

The UK Consumer Digital Index 2021, produced by Lloyds Bank (2021), highlights that for some people, digital exclusion is rooted in a fear of getting online, both because the internet is largely unknown to them, and because they are worried about the threat posed by online scams. In a study of digital exclusion among older people, Holgersson et al. (2021) indicate that the fears people have around getting online include fears of fraud, computer viruses, and causing negative effects by not using a device or website correctly. This fear is not limited to older people: Holmes and Burgess (2021) observe that where people have limited digital skills and understanding of the internet, these fears can be pronounced, particularly when it comes to online activities with a higher perceived risk, such as online banking.

7.3. Digital literacy

A fear of getting online is closely related to digital literacy, which represents another key challenge for addressing digital poverty. As highlighted in section 3.3, a lack of digital skills is a widespread problem in the UK. If digital poverty is to be tackled effectively, there will need to be a significant improvement in digital literacy.

However, it is important to note that improved literacy has not historically led to an alleviation of poverty, and Bach et al. (2018) argue that digital literacy programmes which aim to help people to learn online skills will also not succeed in helping people out of poverty. Indeed, while digital exclusion and poverty are closely linked, because this relationship is complex, and is embedded in broader structural inequalities, improving individuals' digital literacy is not a solution on its own (ibid.) As Helsper (2017) suggests, focusing on individuals' skills alone in efforts to tackle digital poverty may distract from these broader inequalities, and from collective responsibilities to tackle them.

7.4. Infrastructure

As highlighted in section 3.1, a lack of suitable infrastructure – including insufficient signals from the 4G or 5G network, a lack of high-speed broadband connections and issues caused by construction materials within homes and neighbourhoods – can pose a barrier to accessing the internet. The infrastructural challenge is particularly pronounced in some rural areas, where broadband and mobile signals may be slower or more expensive, if they are available at all (Williams et al., 2016). This is particularly problematic for rural residents who are unable to get online as their location may also mean that they have to travel long distances to access offline services (ibid.).

However, as previously highlighted, a lack of suitable infrastructure is not solely a rural issue. Indeed, construction materials can block signals in built-up areas (see section 3.1). In addition, housing can impact infrastructural challenges associated with digital poverty in several ways. For instance, people living in multi-storey buildings may struggle to gain access to broadband as fire safety regulations can be prohibitive for installing the necessary cabling. Meanwhile, in new-build developments where developers have made deals with particular broadband providers, residents may have limited choice, and may not have an affordable option (for more details on the infrastructural barriers related to housing, see Holmes et al., 2022).

7.5. Other priorities

As previously highlighted, there is a close relationship between digital poverty and poverty more broadly. As a result, therefore, many people facing digital exclusion are also facing an array of other critical issues, meaning that getting online may not be considered a priority. For instance, Holmes and Burgess (forthcoming) observe that where people are facing pressing financial issues, such as debts or rental arrears, and are forced to choose where to make savings, maintaining or gaining internet access may be considered less important than other financial outgoings. People who are struggling financially may also feel that they cannot justify spending more on improving their levels of digital inclusion, reflecting the persistent view that digital inclusion is a 'nice to have', despite mounting evidence that being online is now essential in many ways (ibid.). Tackling this issue would require policy recognition that digital inclusion is essential, as well as concerted efforts to address other aspects of poverty which are often experienced by those directly affected as more urgent than digital inclusion.

7.6. Siloed policymaking

The tendency for policy to be siloed is a further challenge for tackling digital poverty. Digital inclusion is essential for success across a whole range of governmental priorities, including education and economic growth, and Garallo (2019) argues that, for the issue to be tackled successfully, the silo-ing of policy across different governmental departments (at both local and national levels) must be overcome. While Garallo's (2019) study was based on practices in the USA, this is also an issue within the UK. There is recognition within policy circles that a 'joined up' approach will be needed to improve the situation (Edwards, 2021), and ensuring that strategy and funding for policy areas such as infrastructure and growth are aligned will best support local digital inclusion outcomes.

8. Harnessing digital technologies to address local needs and inequalities

This section points out some of the ways in which technologies can be harnessed to meet local needs and address inequalities. The section indicates that in order to ensure this can be done effectively, the challenges highlighted in the previous section will need to be addressed and mitigated against. The section also highlights some of the ethical issues raised by the increased use of digital technologies.

8.1. Opportunities for harnessing digital technologies

Digital technologies have become increasingly prominent in everyday life, and there is recognition that such technologies could play a role in addressing the local needs of residents. For instance, digital technologies are increasingly put to use as a means of providing access to health and community services. In terms of health services, digital technologies can help address healthcare needs by providing online health information (e.g., the NHS website[1]), as well as facilitating access to medical expertise (e.g., video conferencing for GP appointments) and medical commodities (e.g., ordering medicines and devices) (World Economic Forum, 2021). In addition, the use of telecare and telehealth technologies to offer remote care for elderly and physically less able people has been proven helpful in providing care for patients and helping them to continue living independently (Age UK, 2021).

Digital technologies can also facilitate access to local services provided by local authorities. For a variety of reasons, including to reduce costs or in response to budget cuts, to facilitate easier sharing of information and resources with other public bodies, to streamline their services, and to manage demand, many local authorities have been moving key services online (Local Government Association, 2014). Those citizens who have digital access can benefit from self-service platforms or interact with public services electronically (Local Government Association, 2014), something which can be more time and cost effective for both citizens and the local authority.

In addition, technology can make joined-up services accessible in one place. For example, family-focused websites (e.g., Family Space in in the London Borough of Croydon) facilitate easier access to information on local children's services. Technology can also help to bring people together through online social media and information sites (e.g., Casserole Club - a

[1] www.nhs.uk

community project specifically designed to connect people who like to cook with their older neighbours who aren't always able to cook for themselves). These services can help users to continue living independently and enjoy an improved quality of life (Local Government Association, 2014).

Smart technologies in homes have the potential to improve residents' quality of life. Technologies which can identify condensation, damp or mould and flag fuel poverty are all available. In addition, technologies such as smart meters can help residents to optimise energy use, lower their heating bills and reduce energy consumption. A smart meter can also be a touchpoint between a supplier and their more vulnerable customers, as households can receive tailored energy advice, safety advice and eligibility checks for government schemes which may ultimately help to address their fuel poverty (Smart Energy GB, 2019).

8.2. Concerns around the increased use of digital technologies

Despite the above-mentioned benefits that digital technologies can offer to address local needs and inequalities, there are concerns that these technologies may reinforce inequalities for those with limited or no access to these services. There are also concerns around the risk of abolishing ordinary face-to-face services which may disadvantage those without access to the internet and digital technologies. For instance, while the UK government has now made many of its services 'digital by default', there are serious concerns that those needing access to government welfare support are likely to be at high risk of digital exclusion (due to the relationship between broader disadvantage and digital poverty) and may be further disadvantaged by this shift to online service provision (Yates et al., 2015). In addition, there are ethical issues raised by the increased use of digital technologies, including the potential for privacy issues, the misuse of personal information, and algorithmic biases which can create unfair outcomes (Royakkers et al., 2018).

9. Governance

In tackling digital poverty, the role of the public sector is key to widening access to digital technology and providing digital skills initiatives in the community. However, there are also suggestions that collaboration with the private sector is vital to making this happen (Local Gov, 2020). Furthermore, connections need to be made across multiple levels of governance (at national, regional, and local scales) to address digital poverty. This section highlights some of the key discussions on the role of governance in tackling digital divide.

Several third-sector organisations, community groups, and charitable organisations have already made a considerable impact in their efforts to tackle digital exclusion within the UK. For instance, the Good Things Foundation has launched a number of initiatives, including Learn My Way which provides free beginners' courses on digital skills (Good Things Foundation, 2021). Meanwhile, the APLE Collective – a national network of people experiencing poverty – has been campaigning for people on low incomes to have access to free wi-fi, and for people with experience of digital exclusion to have the opportunity to provide input into efforts to tackle the issue, among other goals (APLE Collective, 2022). Community groups are understood to be well-placed to learn how people experience digital exclusion locally, and to call for action to address it in line with local needs (Local Trust, 2021). However, there is recognition that the government, together with the private sector, has a key role to play in delivering initiatives to overcome digital poverty (ibid.).

While central government can play a determining role in addressing the digital divide, particularly due to its ability to provide funding (e.g., through programmes like Project Gigabit), local councils have local knowledge and expertise that can make a difference to a well-managed roll out of a digital inclusion programme (Local Government Association, 2021). It is thought that local councils are well-positioned to act as a key contact point between government, internet service providers and communities (Local Government Association, 2021). The Superfast Broadband Programme is an example of how a programme funded by government and delivered by councils can be set up with the aim of targeting communities most in need and providing digital upskilling (Local Government Association, 2021).

By partnering with the private sector, particularly the telecommunications industry, local councils can deliver skills programmes and increase access to devices, as well as extend high speed mobile and full-fibre broadband to the hardest to reach areas to increase access to affordable broadband connections (Local Government Association, 2021). The Greater Manchester Combined Authority partnership with Virgin Media Business is one example of a public-private collaboration to tackle digital inequality. As a result of this collaboration, in

addition to delivering fibre optic connectivity to public sector sites throughout the city-region, new apprentice roles were provided, digital skills programmes for young people were organised, free connectivity was delivered to homeless shelters and community centres, and some school children were provided with digital kit bundles (Virgin Media Business, 2022).

Although local government is often well-placed to tackle digital inequality for local communities due to their embedded local knowledge, partnerships with central government and regional stakeholders will be required to go further and tackle regional inequalities in broadband infrastructure and accelerate the roll out in rural communities (Local Government Association, 2021). This will be necessary to design an approach to roll out that will benefit those communities which are currently disadvantaged (ibid.). As recommended by the Local Government Association (2021), to move forward, 'councils should be empowered to work innovatively with their communities, government and its agencies to design a locally determined skills and employment offer that aligns with infrastructure spend and delivers better outcomes for residents and businesses'.

10. Understandings of digital poverty and COVID-19

As this report has indicated, there is a wealth of knowledge about digital poverty, both in the UK and elsewhere. Much of this knowledge is derived from social sciences and humanities disciplines, providing a complex picture of how digital poverty emerges and is experienced across a number of different contexts. The understandings of digital poverty and inequality offered by these disciplines could usefully inform approaches to tackling digital exclusion going forward.

The COVID-19 pandemic has drawn attention to digital poverty and has brought the issue into the spotlight within both the policy agenda and public consciousness. Moreover, the pandemic has worsened the impact of digital exclusion for many as an increasing number of daily activities have moved online (Centre for Ageing Better, 2021). Existing understandings of digital poverty have identified key issues with regards to the pandemic. For example, Watt (2021) raised concerns that the reduction in availability of in-person medical appointments, combined with a reluctance to go to a doctor's surgery during the pandemic; health inequalities were growing as a result of digital exclusion, as some patients could not make effective use (or indeed any use) of online appointments. Existing understanding of who is affected by digital poverty suggests that people with higher levels of education are more likely to use technology for their healthcare, resulting in widening health inequalities between this group and those with lower levels of formal education (ibid.). Where the wider disadvantage of those who are experiencing digital exclusion is understood, steps can be taken to mitigate it, including ensuring continued access to in-person care.

Of course, the impact of COVID-19 on people facing digital poverty is not limited to health outcomes. Children learning from home without adequate access to the internet or a suitable dedicated device were often disadvantaged compared to their peers who did have this access, particularly in households where a limited number of devices needed to be shared among multiple household members who all had online learning or work to complete (see Holmes and Burgess, 2020). It is thought that the disruption to learning was greatest for children from already disadvantaged households. Indeed, approximately 20% of children eligible for free school meals are understood to have been unable to access a computer from home, compared with 7% of children who are not eligible for free school meals (Green, 2020). Again, it is clear that digital poverty and broader disadvantage are closely linked, and that addressing this relationship will be key in tackling digital poverty during the pandemic period and beyond.

As set out in this report, the existing body of social sciences and humanities research on digital poverty provides a number of key insights which will be highly valuable in policy-

making going forward. The following section distils a number of these insights into a set of key policy recommendations for tackling digital poverty.

11. Policy recommendations

Having set out several important contributions to the literature on digital poverty, this report has made it clear that the knowledge generated by the social sciences and humanities on the topic is highly useful for both expanding our understanding of the problem and for subsequently addressing it. In this section, recommendations informed by the literature are set out with suggestions for how digital poverty could be appropriately addressed going forward.

Governance and policy-making

- It is clear that a siloed approach to policy making poses a significant barrier to addressing digital inequalities. A more joined up approach which enables different government departments to collaborate and work together to align their approach to tackling digital exclusion across different policy areas will be required.
- Local knowledge is important in ensuring that efforts to tackle digital poverty target the people who need support, and that this happens in the right way. Local authorities should be given the support they need to engage with their residents and to work with government, private sector and third sector partners to develop strategies which work at the local level.
- Public-private partnerships will be necessary to ensure that provision of digital services (specifically high quality broadband connections) reaches all communities, and avoids privileging the most financially well-off communities where potential for profit is highest.

Targeting responses

- There are variations in the levels of digital exclusion experienced in different places and by different demographic groups. Information on who is affected by digital exclusion should be better utilised in policy to target responses to those who need them most, and to adapt responses to people's needs.

Skills gaps

- There is a clear lack of digital skills in the UK. Providing opportunities for people to improve their digital skills and build their online confidence will be essential to filling the digital skills gap in the workforce. Given that the most disadvantaged children are more

likely to be digitally excluded, every effort should be made to avoid further entrenching inequalities and ensure that those without access to the internet at home, or with limited opportunity to use it at home, are given additional opportunities to practice their digital skills and gain access to online opportunities.

Mitigating the impacts of digital exclusion

- Essential services should be easily accessible by everyone, regardless of whether or not they are digitally included. When undertaking changes to services or improving digital provision, care should be taken to ensure that this does not provide a further barrier to those unable to access digital services effectively. Offline provision should therefore be maintained for those who need it. Meanwhile, given that many people who are online have limited digital skills, online platforms should be designed with these people in mind, and care should be taken to make webpages and apps as easy as possible to navigate and to understand.

Internet access as essential

- Digital inclusion is often treated as a 'nice-to-have' or as a luxury which people can manage without. This is despite an abundance of evidence outlining the detrimental impacts of digital exclusion on people's lives. Efforts should be taken to ensure that digital inclusion is treated as essential in policy. This could mean that access to an internet connection should be treated as a statutory right.

Poverty and digital exclusion

- There is a clear relationship between digital poverty and broader structural disadvantage. Efforts to tackle digital poverty should therefore recognise that addressing inequalities more broadly will be essential to ensuring that people have the opportunities needed to get online. As such, policy should recognise that, while initiatives which target a specific driver of digital poverty (such as those which address a lack of digital devices by distributing tablets and laptops) may be helpful in the short term, long term solutions to digital poverty need to pay greater attention to the societal contexts from which digital poverty emerges.
- It is clear that people on low incomes are at greater risk of digital poverty. Serious efforts should be made by the government – in collaboration with private and third sector organisations – to ensure that the costs of getting online are affordable. For those on the lowest incomes, this will likely mean that free provision of high-quality internet access is

required to ensure those in the most disadvantaged socio-economic groups have access to online opportunities.

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