Information and Communication Technology (ICT) Use Amongst People Who Were Housed in Emergency Hotel Accommodation During the COVID-19 Pandemic: Lessons from a Policy Initiative

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Abstract_ *Use of mobile phones, computers, and the Internet (ICTs) is part of everyday life; however, people experiencing homelessness have reduced opportunities to connect digitally. Responding to the COVID-19 pandemic, the UK Government implemented a policy initiative ('Everyone In') to provide emergency accommodation for people without homes. Alongside other essential support, many were given smartphones, credit, and/or access to free WiFi. This paper explores how people engaged with ICTs whilst they lived in two Everyone In hotels and after they returned to community settings. Between June 2020 and July 2021, we conducted 312 interviews with 35 people and analysed the data via Iterative Categorization. Participants owned inexpensive devices, that were sometimes in poor repair, and had often been gifted to them. Most described themselves as reliant on their phone and used it daily. Key barriers to ICT use were lack of credit, no/poor WiFi, and inability to charge devices. Desire for additional devices increased over time, especially after participants moved into more independent accommodation. We relate our findings to theoretical literature on digital inequalities, capital, and new materialism, and a simple model of ICT engagement is proposed. Drawing upon this, we identify ways of enhancing ICT use amongst people experiencing homelessness.*

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Introduction

There is no universally agreed definition of homelessness, but its more extreme forms involve having no shelter or place to live (Neale, 1997; Humphry, 2014; Busch-Geertsema et al., 2016). People who are experiencing homelessness comprise one of the most vulnerable groups within society, often experiencing high levels of morbidity, mortality, poverty, unemployment, social isolation, loneliness, and poor access to healthcare (Rokach, 2005; Beijer et al., 2012; Fazel et al., 2014; Shinn et al., 2015). In England, official statistics suggest that, in the autumn prior to the COVID-19 pandemic, there were 4266 people experiencing street homelessness on a single night (MHCLG, 2021). According to the UK homeless charity Shelter, meanwhile, the number of people who were experiencing homelessness or in temporary accommodation in England in 2019 was 280000 (Shelter, 2019).

Information and Communications Technology (ICT) refers to the use of computers and other electronic equipment and systems to collect, store, use, and send data electronically (Cambridge Advanced Learner's Dictionary and Thesaurus, 2021). The use of ICTs, such as mobile phones, computers, and the Internet, are now part of everyday modern life and having access to ICTs is increasingly considered an essential prerequisite to meaningful participation in society (OECD, 2000; Phipps, 2000). Despite this, the spread of ICTs have been uneven and many groups, including people experiencing homelessness, have had reduced opportunities to connect digitally (Sanders, 2020; Good Things Foundation and Homeless Link, 2021).

Poor engagement with ICTs has often been termed 'the digital divide' and people not using ICTs have been referred to as 'digitally excluded' (Selwyn, 2004; Dutton and Blank, 2013). More recently, the assumption that people are either users ('included') or non-users ('excluded') of technology has been replaced by a more nuanced understanding that there are different types and degrees of exclusion (or 'digital inequality'). Thus, digital exclusion is better understood as a multidimensional phenomenon; including, for example, not having the physical infrastructure (devices, software, and network access) to go online; an inability to acquire, maintain, or update digital skills; and lack of motivation for, or interest in, using digital technologies (Czaja and Urbaniec, 2019). Digital inequalities are also underpinned by socio-economic disparities relating to income, class, gender, race, education, age, disability, and place etc. (Lawson-Mack, 2001; Robinson et al., 2003; Gilbert et al., 2008). Furthermore, digital inequalities themselves create and

compound socio-economic disparities because poor engagement with technology reduces access to societal resources and other life opportunities (Halford and Savage, 2010; Humphry, 2014).

Establishing an accurate picture on the use of ICTs by people who are experiencing homelessness is difficult given the rapid pace of technological change and variability within and between countries and homeless populations. Studies from the UK, North America, and Australia have, however, shown that many people who are experiencing homelessness are digitally connected, but their use of ICTs is different from those who are housed (Humphry, 2014; Rhoades et al., 2017; Calvo et al., 2019; Sanders, 2020). For example, many people who are experiencing homelessness own a mobile phone, but not a computer, and rely on expensive pre-paid services, rather than cheaper contracts with network providers (Humphry, 2014; Neale and Stevenson, 2014). This often results in higher costs and reduced mobile credit, as well as periods of disconnectivity (Humphry, 2014; Gonzales, 2016; Polillo et al., 2021). In one study of people who were experiencing homelessness and using substances conducted in England during 2012/2013, nearly all participants had a mobile phone, but most had basic inexpensive phones, several had phones that did not work, and many spoke of losing or having phones stolen (Neale and Stevenson, 2014).

Although many participants in the study by Neale and Stevenson (2014) used their mobile phone daily to call or text, others explained that they did not use their phones very often as they could not afford credit, had problems charging their devices, or just wanted a phone to make or receive calls occasionally. Alongside calling and texting, participants said that they used their phones for emailing, setting alarms or reminders, listening to the radio or music, keeping a diary, making audio recordings, taking photographs or videos, playing games, and using the calculator function. Some reported good knowledge of their mobile phone and its capabilities, but others said that they did not take full advantage of their device because they did not know what it could do, how to set up and use functions, what their current payment method covered, or how to monitor their usage to avoid large bills. Computer literacy was also variable. A few participants said that they knew how to program, others stated that they knew 'enough', and some emphasised that they did not know much about computers at all (Neale and Stevenson, 2014).

According to a more recent international scoping review, the percentage of adults who were homeless and using social networking sites ranged from 17% to 41% (Calvo and Carbonnell, 2019). Meanwhile, a separate review of ICTs and e-Health found that people experiencing homelessness used mobile phones primarily to communicate with other people or to access information via the Internet, whereas they used computers to search for work, refuge, or housing; to communicate with other people; and for leisure (Calvo et al., 2019). A later systematic review concluded

that people experiencing homelessness were interested in using ICTs and were willing to use technology for health-related purposes (Polillo et al., 2021). This finding is consistent with Neale and Stevenson (2014) whose participants expressed a desire to learn more about ICTs; Calvo and Carbonnell (2019) who concluded that people experiencing homelessness were motivated to use social networking sites; and Dorney-Smith and Gill (2017) who reported that members of the homeless population in London, UK, were interested in having online access to their GP records.

Using ICTs is not without risk and dangers; for example, online theft, fraud, harassment, violations of privacy, data loss, account hacking, and other breaches of trust. Nonetheless, research has shown how mobile phones and computers have many potential benefits. Amongst people experiencing homelessness, this can include helping them to (re)establish and maintain relationships and alleviate boredom (Neale and Stevenson, 2014; Moczygemba et al., 2021). Virtual contact through social networking sites can also reduce their risk behaviour, substance use, and depressive symptomology whilst increasing their opportunities for employment and job training (Yost, 2012; Rice et al., 2011; 2012). Learning to use Facebook has additionally been shown to enhance the psychological well-being of people experiencing homelessness (Calvo and Carbonell, 2019) and mobile phones can help them manage medication (Burda et al., 2012). In short, ICTs can offer important opportunities for improving health and well-being, increasing social integration, raising goals and aspirations, and producing tangible benefits in a range of life areas (Neale and Stevenson, 2014).

COVID-19

In March 2020, COVID-19 was declared a pandemic (WHO, 2020a) and there was rapid and widespread agreement that people who were experiencing homelessness were at heightened risk of contracting the virus and of becoming unwell (Bernard, 2020; US CDC, 2020; WHO, 2020b). In response, the UK Government implemented a policy initiative, known nationally as 'Everyone In', to provide temporary and emergency accommodation (often in commercial hotels) for everyone experiencing street homelessness and other forms of homelessness (Crisis, 2020). By July 2021, data suggested that 37 000 people had been supported by Everyone In, and, of these, over 26 000 had been moved into longer-term accommodation (The Kerslake Commission, 2021).

In London, Everyone In was overseen by the Greater London Authority and London borough councils, which brought together multiple services and agencies to provide temporary accommodation for over 5 000 people. Alongside a room, free food, medical care, advice on benefits, and broader social care and support, many

of those accommodated within Everyone In were given relatively inexpensive smartphones and credit, as well as free WiFi, to make it easier for them to maintain contact with professionals (St Mungo's, 2021). Some service providers also helped those living in the hotels to access online services and to apply for grants for laptop computers (St Mungo's, 2021). This was considered necessary given that the pandemic had resulted in most care and support, including assessments and routine appointments, being transferred online or to phone or video calls; yet mobile phone ownership amongst those accommodated was believed to be low (Doctors of the World, 2020).

In this paper, we explore how a group of people, including some who had been given mobile phones, engaged with ICTs whilst they were living in two Everyone In hotels and during the nine months after they had moved out. To this end, we draw upon data collected as part of an unfunded rapid evaluation of Everyone In conducted between June 2020 and July 2021 (Neale et al., 2020; Neale et al., 2021; Parkin and Neale, 2021). Ethical approval for this research was granted by King's College London Research Ethics Committee (CREC-HR-19/20-18676) and access to the two hotels (hereafter Hotel A and Hotel B) was approved by the service providers managing the premises. In separately analysing and presenting the data on engagement with ICTs, our objective is to provide insights that might inform digitally inclusive policies and service delivery for people experiencing homelessness in the future.

Methods

Recruitment

The study design was qualitative, longitudinal, and conducted by telephone due to social distancing requirements (Parkin et al., 2021). As all hotel residents were presumed to have been given a phone if they did not already own one and had been advised to stay in their rooms except for essential activities, this provided an unusual opportunity to interview people who might normally be invisible to, or excluded from, telephone-based research. To optimise recruitment, however, three team members (JN, NM, and DR) attended the two hotels in person on six separate occasions between June 2020 and September 2020. During each visit, they knocked on room doors, gave brief verbal explanations of the research (whilst wearing face coverings and at a safe distance), and left study information packs comprising a participant information sheet and informed consent form. The study pack also included a phone number which residents were invited to text or call if they wanted to learn more and/or participate. Approximately 300 study packs were distributed, and 41 hotel residents contacted the research team.

One team member (SP) answered all telephone calls and texts and spoke to all potentially interested hotel residents to check that they understood the aim of the study and what participation would involve. Once a resident had confirmed that they wanted to participate, SP established a date and time for their first interview. Six residents who made contact spoke almost no English and so could not meaningfully consent, meaning that only 35 of the 41 residents were recruited. These 35 residents were told that a researcher would be in touch to interview them at the agreed time, and interviews were then conducted by one of a team of 11 interviewers. Prior to any data collection, all 11 interviewers attended online training sessions on conducting the interviews and managing, entering, and storing the data securely. Throughout the study, team members also maintained regular online contact with each other to share procedural information, trouble shoot, and ensure consistency of approach.

Data generation

Data were generated in three distinct stages (see Box 1).

Box 1: Data Generation

	Stage 1 ('in hotel')	**Stage 2 ('move on')**	**Stage 3 ('post hotel')**
Date	June – September 2020	July – December 2020	April – July 2021
Number of participants	35	28	13
Recruitment hotel			
Hotel A	31	26	13
Hotel B	4	2	0
Number of interviews completed by each participant	1-5	1-5	1
Duration of interviews	20-30 minutes	20-60 minutes	25-30 minutes
Total number of interviews completed	165	134	13
Topics covered	Demographic characteristics and life circumstances; experiences of moving into and living in the hotel; housing and homelessness prior to the pandemic; alcohol and other drug use; smoking; health, including COVID-19; accessing support; relationships; use of ICTs; and expectations about moving out of the hotel	Current life circumstances; experiences of moving out of the hotel; current accommodation; alcohol and other drug use; smoking; health, including COVID-19; accessing support; relationships; use of ICTs; and views on the future	Current life circumstances; current accommodation; relationships; substance use; health, including COVID-19; use of ICTs; and views on the future

Stage 1 ('in hotel') comprised interviews with the 35 hotel residents whilst they were living in Hotel A (n=31) or Hotel B (n=4). So as not to overwhelm participants by asking them to commit to a lengthy telephone interview, each resident was invited to participate in up to five brief telephone interviews (each lasting between 20 and 30 minutes, conducted over the course of a week). Whenever possible the same interviewer conducted all the interviews with any given participant. During Stage 2 ('move on'), 28 participants were successfully recontacted, and all again participated in up to five follow-up interviews (each lasting between 20 and 60 minutes, conducted on a weekly basis over one month). Where possible, each Stage 2 interview was completed by the same interviewer who had undertaken any given participant's Stage 1 interviews. Stage 3 ('post hotel') occurred nine months after participants had left the hotel where we had recruited them. Many of the phone numbers used at Stages 1 and 2 were now out of service but 13 participants were successfully recontacted, and each completed one short follow-up interview with SP (each lasting between 25 and 30 minutes).

In total, 312 interviews were conducted (165 interviews at Stage 1; 134 interviews at Stage 2; and 13 interviews at Stage 3). Of these, 311 interviews were audio recorded; generating a total of 125 hours of recorded interview data (52 hours from Stage 1; 62.5 hours from Stage 2; and 10.5 hours from Stage 3). One Stage 3 interview was conducted by email because the participant was in Europe and had problems connecting by phone. Prior to the interview, participants provided verbal consent which was also audio recorded (Gordon, 2000). All participants received a £40 gift voucher on completion of their Stage 1 'in hotel' interviews; a £50 gift voucher on completion of their Stage 2 'move on' interviews; and a £10 voucher on the completion of their final Stage 3 'post hotel' interview. Those who completed all three stages of the study therefore received a total of £100 in gift vouchers.

Data management and analyses

The 11 interviewers entered their own interview data into a preprepared Excel file. This comprised a sheet for each interview, a row for each participant, and a column and sub-columns for each topic. Each interviewer listened to their own interviews and summarised their participants' responses into the appropriate cells in the file. After each study stage, JN merged all the interviewers' Excel files into one main Excel file which then provided the source for undertaking a framework-guided rapid analysis (Ritchie and Lewis, 2003; Gale et al., 2013; Parkin et al., 2021) for the main study reports (Neale et al., 2020; Neale et al., 2021; Parkin and Neale, 2021). This was achieved by reading across the spreadsheets to review individual participants' responses to different topics at different times and down the spreadsheet to identify patterns and themes relating to each topic.

For this paper, all data entered under ICT-related topics (columns in the Excel file) were first analysed inductively by JN following the principles of Iterative Categorization (Neale 2016; 2020). To this end, the ICT-related columns within each sheet (interview) were reviewed and similar points were grouped together in one Word document to produce a summary for each of the three interview stages. Findings from the three ICT summaries were then read together and this indicated that all the key ICT data could be organised under five descriptive headings: i. the types of devices participants owned; ii. ICT usage; iii. data and credit; iv. barriers to ICT engagement; and v. the relevance of ICTs to participants' lives. Next, the content of each of the three summary documents was merged into one main Word document and re-ordered under the five descriptive headings by interview stage. After the data had been reorganised in this way, JN returned to the Excel file to check for accuracy and updated the Word document with minor amendments.

At this point, internal university funding was secured to professionally transcribe the Stage 3 interviews. In addition, JN and SP listened to a selection of the remaining audio files and transcribed salient comments relating to ICTs. The professionally transcribed and team transcribed data together provided a stock of verbatim data from which quotations could be selected to illustrate key findings. Once a draft of the manuscript had been completed by JN, all authors who had been involved in the interviews (AB, SP, LH, and LK) reviewed the findings to check that they were consistent with their own recollections and interpretations of the data. Any discrepancies were resolved by returning to the study Excel files and audio transcriptions, and the manuscript text was amended accordingly.

Participants

Most of the 35 study participants were single, separated, divorced, or widowed (few said that they had partners). As Hotels A and B only accommodated adults, no participants had resident children (although about half had children who were living with ex-partners or who were grown up). At Stage 1, participants were mostly male (n=28) and had a mean age of 48 years (range 21-75 years). In total, 11 had been born in the UK, three had been born in other parts of Europe, and 21 had been born in other parts of the World (Algeria, Angola, Antigua, Brazil, Ecuador, Eritrea, Ghana, Iran, Iraq, Jamaica, Nigeria, Guinea, South Africa, Togo, Trinidad, and the United States). Several participants said that they were asylum seekers, refugees, or had no legal immigration status (others preferred not to discuss this topic).

The longest period of homelessness at Stage 1 was 30 years and the shortest period was four nights. Whilst homeless, people stated that they had slept in a variety of places, including hostels and shelters, bed and breakfast hotels, empty buildings, parks, vehicles, at airports, on the streets, and in the homes of acquaintances. When Hotels A and B closed (autumn 2020), participants were moved to

diverse types of accommodation, including other hotels within Everyone In, hostels, bed and breakfast hotels, shared flats, independent flats, houses of multiple occupation, and supported accommodation. In addition, two male participants went travelling in Europe and another returned to living in a tent. Only one of the 13 participants interviewed at Stage 3 had a secure tenancy beyond 2021.

Table 1 presents other basic information about participants at all 3 stages and shows how the profile of the sample changed slightly between Stages 1 and 3 due to participant attrition.

Table 1: Participant Characteristics

Characteristics	Stage 1: 'in hotel' N = 35 (%)	Stage 2: 'move on' N = 28 (%)	Stage 3: 'post hotel' N = 13 (%)
Sex:			
Male	28 (80.0)	23 (82.1)	11 (84.6)
Female	7 (20.0)	5 (17.9)	2 (15.4)
Mean age in years (range)	48 (21-75)	47 (21-75)	53 (29-76)
Born			
UK	11 (31.4)	11 (39.3)	5 (38.5)
Europe	3 (8.6)	2 (7.1)	1 (7.7)
Other parts of the world	21 (60.0)	15 (53.6)	7 (53.8)
Formal qualification			
Yes	20 (57.1)	18 (64.3)	9 (69.2)
No	15 (42.9)	10 (35.7)	4 (30.8)
Homeless for three years or more			
Yes	14 (40.0)	13 (46.4)	7 (53.8)
No	16 (45.7)	13 (46.4)	6 (46.2)
Missing	5 (14.3)	2 (7.1)	0 (0.0)
Self-reported problems with alcohol or other drugs			
Yes	10 (28.6)	9 (32.1)	4 (30.8)
No	24 (68.6)	19 (67.9)	9 (69.2)
Missing	1 (2.9)	0 (0.0)	0 (0.0)
Given a hotel phone			
Yes	14 (40.0)	13 (46.4)	4 (30.8)
No	19 (54.3)	15 (53.6)	9 (69.2)
Missing	2 (5.7)	0 (0.0)	0 (0.0)

Findings

Devices owned

At Stage 1, all participants confirmed that they owned a mobile phone, and some reported that they owned more than one phone. However, these devices were often basic ('non-smart') phones that offered limited functionality. Fourteen participants

said that they had been given a smartphone with some credit or free data (all from Hotel A), and others described how they owned phones that they had bought or been gifted prior to the pandemic. For example, one male participant had previously been given a basic phone from a homelessness charity but had more recently bought a second-hand phone from a friend:

> [Homelessness charity] did give me one… It's not the latest Samsung whatever. It's just a little… old-fashioned green screen mobile… That saved me because I didn't have a phone at that time… Since then, I managed to save up money and buy a proper phone. I've bought a Motorola phone from a friend of mine. It's a second-hand phone… I just pay him in instalments. (Stage 1, participant 18, Hotel A, male, aged 55 years, born in the UK)

When interviewed at Stage 2 (immediately after leaving their first hotel), some participants were still using the smartphone given to them in Hotel A, others were using a phone that they had prior to the pandemic, and some were using a phone that they had been given or bought more recently. A few participants reported that they continued to own more than one phone, although many said that they owned phones that were broken or not fully functional (for example, one participant's phone could not make calls whilst another's had audio problems).

By Stage 3, only four of the participants who had originally been issued with a hotel phone remained in the study and only two continued to use that phone (the third had reverted to an 'old' phone, and the fourth had swapped the SIM card over to a different phone). Most participants at Stage 3 were using their own (non-hotel) phone and again described a mixture of relatively inexpensive smartphones and old 'basic' phones, which were often in poor working order:

> It's damaged, because the screen, it fell… As I'm talking to you the screen is black. (Stage 3, participant 03, Hotel A, female, aged 36 years, born outside the UK)

In addition to owning a mobile phone, several participants at Stage 1 reported that they owned a tablet and/or laptop computer and one said that he had an iPod Touch. Participants did not, however, always have these devices with them in the hotel, often explaining that they were being stored by family, friends, or a charity. By Stages 2 and 3, a small number of participants who had moved into more independent accommodation had acquired extra devices, such as a smart television, Kindle, and/or laptop, usually donated by a friend, relative, or charity, rather than personally purchased. In addition, several participants said that they visited community libraries to access a computer and one borrowed a laptop belonging to the hotel where he was currently staying.

ICT usage

Whilst living in Hotels A and B, several participants reported that they only used their phone occasionally whereas many said that they used their phone all the time. Most reported using phones for making and receiving calls and texts, but also for other internet-based activities. As one male participant explained:

> I use my phone for calling people, social media, texting people, emails, banking, so every potential thing. (Stage 1, participant 02, Hotel B, male, aged 21 years, born outside UK)

Participants routinely described how they liked to use applications (apps) for listening to the radio, music, and podcasts; watching TV; getting news; looking things up; studying; emailing; writing blogs or poetry; learning about arts and crafts; taking photographs or videos; supporting their recovery from addiction; participating in online social groups; playing games; monitoring their fitness; learning languages; reading the bible; shopping; or banking. A few participants said that they did not engage with social media because they did not want an obvious online presence in case they were identified by the Home Office (government department responsible for immigration, security, and law and order), and one expressed concern about dating apps, to which he believed he was addicted. In contrast, many others said that they enjoyed using social media (including Facebook, Snap Chat, Instagram, Twitter, LinkedIn, Viber, YouTube, TikTok, and Grindr); although a few clarified that they preferred to view others' profiles rather than post material themselves:

> I'm kind of like a voyeur of apps… I watch YouTube videos and, erm, and social media wise, like, I'm on a few but… I don't ever post anything on Facebook, but I just use it to, like, look at my friends… and stuff like that. (Stage 1, participant 16, Hotel A, female, aged 44 years, born outside the UK)

Whilst living in the hotels, many participants also used video calling platforms (WhatsApp, Zoom, Facetime, Skype, and Vivo) to speak with relatives (who were often overseas), friends, employers, or members of church or refugee groups to which they belonged. Indeed, many said that they liked to see the caller's face on their screens. Despite this, some participants stated that they did not have anyone to video call (particularly if family members in their home countries did not have the necessary technology), they preferred face-to-face contact, or they were too self-conscious about their appearance to use this facility:

> Personally, I don't really like video calling, because… I hate seeing my face on things. (Stage 1, participant 29, Hotel A, male, aged 56 years, born in the UK)

In addition, participants sometimes used laptops and tablet computers for studying, looking things up, attending online classes, producing artwork, applying for benefits and jobs, and completing paid work. Only a few participants stated that they did

not know how to set up a mobile phone and would need support with this. In contrast, many said that they would be willing and able to help other hotel residents set up their phones, and some added that they had already assisted people in the hotel with this.

Varied patterns of phone and wider ICT use were also evident at Stages 2 and 3, after participants had left their first hotels. Alongside the ICT-related activities reported at Stage 1, people were now using their phones and other devices for contacting a wider range of services and professionals (doctors, hospitals, drug treatment services, housing organisations, immigration services, solicitors, lawyers, and benefit agencies); for working or a paid job; for travel-related activities (booking and paying for tickets and using maps); and for jobhunting or looking for volunteering opportunities. For example, one male participant, who had returned to travelling in Europe, explained how he used his phone constantly:

> I'm never off it [phone]… you have to take videos and pictures of everything… you have to look up everything on Maps… And then I'm on like Facebook poetry groups and then I type up my poetry on my phone too… Then you have to use it for all the other things like for volunteering, and emails, and coaches, and Duolingo and Google Translate and Workaway app. It's just endless. (Stage 2, participant 15, Hotel A, male, aged 38 years, born in the UK)

Data and credit

Most participants stated that they relied on the free hotel WiFi when interviewed at Stage 1, although a few paid their own phone bills (via either a contract or a monthly top up) and several explained that charities, friends, or family members sometimes added credit to their phone. Some participants also described how they had previously struggled to pay phone bills and had accrued debts (sometimes ongoing and sometimes now repaid). One participant noted how he had experienced difficulties paying his phone bill after losing his job in the year prior to the pandemic, but had since managed to repay what he owed and swapped to a less expensive phone contract:

> I was kind of like struggling… until I was able to set up all my payments… But since I got my first Universal Credit [state benefit], then I'm able to clear it [phone debt] all off… Then they [phone company] offered me unlimited everything… For £20 a month… So, I have unlimited calls, unlimited texts. (Stage 1, participant 29, Hotel A, male, aged 56 years, born in the UK)

At Stage 2, several participants confirmed that they had retained their phone contract from before the pandemic, which they continued to pay monthly using their state benefits or work income. Meanwhile, a few had also tried shopping around for a better data package as they felt they were paying too much. Others still relied

on friends or relatives to 'top up' their data or remained grateful for the credit remaining on the free package received with their hotel phone; although several worried about how long these data would last and how they would manage once they ended. Some participants also expressed dismay that they had already used all their credit and so were reliant on free WiFi whenever they could access it, or on a phone in the staff office if this was available in their move-on accommodation:

> Phone calls they don't give us credit for… No top up, no credit… I don't have phone for anything, so if I want to call… [I need to] go down and use the office phone line. The credit they gave me… is finished now. Maybe I can receive a call, but I can't call anybody. (Stage 2, participant 05, Hotel A, male, aged 63 years, born outside the UK)

Participants' ability to buy credit and top up their mobile data nine months after leaving their first hotel varied according to their wider financial situation (access to benefits, employment, and family support) but remained overall limited. Several participants had shopped around in search of data packages that were good value for money; however, most remained dependent on the free WiFi within their current accommodation; had to rely only on incoming calls and texts; or waited for a friend, family member, or charity to top up their credit:

> I'm managing, just managing. Sometimes the charity tops it [phone credit] up for me… Sometimes when I have top-up… I can use the Internet on my phone. (Stage 3, participant 11, Hotel A, male, aged 44 years, born outside the UK)

Barriers to ICT engagement

At Stage 1, only a few participants said that they did not own or use technology because they lacked the necessary IT skills. Most said that cost (particularly having to pay phone bills but also the expense of buying larger devices) was the main barrier to owning and using ICTs:

> Interviewer: Is there a particular reason you don't have an iPad or computer?
> Participant: Because I can't afford it…. You can give me one, I'll be happy.
> (Stage 1: participant 03, Hotel A, female, aged 56 years, not born in the UK)

Some participants also reported that it had previously been difficult to retain devices when living on streets because they were often stolen and/or difficult to charge. Indeed, participants described how, prior to the pandemic, they had to be creative in locating and using electricity sources in public locations, such as cafes, toilets, blocks of flats, libraries, tourist information centres, churches, day centres, and transport hubs. One participant also explained how he and a group of other people who were homeless had accessed free WiFi by sleeping in the doorway of a large London theatre:

> Sleeping at the [name of theatre], you used to get free WiFi there at night. So, I'd try to keep the power [on his mobile phone] up so I could watch the TV at night-time… It's free WiFi down at the theatre. It's just one of the bits of London where you can get free WiFi… It was brilliant… once I worked it out. (Stage 1, participant 13, Hotel A, male, aged 40 years, born in the UK).

During their Stage 2 interviews, participants again reported that the main reasons they did not use ICTs were lack of phone credit, having no or poor access to WiFi, and not being able to charge devices. By this time, some phones had already been disconnected because of non-payment of bills, and many stated that they missed the free WiFi from their first hotel. Those who had been moved into other hotels also often complained that the WiFi available to them now was weak and unstable, which made it difficult to complete online tasks and necessitated constant trips to the hotel reception where the signal was generally stronger. One participant who wanted to study expressed frustration at the combination of noisy hotel neighbours, which disrupted his concentration, and the unstable hotel WiFi:

> There is WiFi… disconnecting, connecting, disconnecting, connecting… it's not stable. (Stage 2, participant 06, Hotel A, male, aged 43 years, born outside the UK)

In addition (and in slight contrast to the Stage 1 interviews), several participants now said that they did not fully understand how their smartphone or tablet computer worked and one noted that her iPad was locked, but she could not afford to pay £20 to unlock it. Another, who relied on an iPod Touch for staying in contact with people by email, was also struggling to keep this charged:

> I have an iPod Touch which I was using quite a lot… with a USB port I could keep the thing trickle charged all the time… I was going to throw it away as not working… but I left it in this trickle charger… and after a couple of weeks it started working, much to my surprise… I'm afraid I haven't had chance at the moment [to charge it]. (Stage 2, participant 12, Hotel A, male, aged 73 years, born in the UK)

After nine months (at their Stage 3 interviews), participants continued to identify the same three core factors as barriers to ICT use. These were: lack of credit, no or poor access to WiFi (including weak signal or slow download speed), and not being able to charge devices (particularly if participants had returned to sleeping on the streets). One participant encountered problems using his mobile phone because he was travelling in Europe and could not connect to the phone networks there. Another, who was still living in an Everyone In hotel, identified a combination of problems, including the slow hotel WiFi, his poor eyesight, and lack of peripheral devices for printing and scanning.

ICT relevance

At Stage 1, most participants said that they relied on their mobile phones for all kinds of tasks and functions. Nearly all were consequently pleased to have received a mobile phone from Hotel A and many of those who had not received a phone expressed disappointment and/or annoyance. Whilst a couple of participants explained that they did not want or need a second phone, others appreciated, or said that they wanted, an additional device. Several participants referred to mobile phones as being 'essential', particularly during the national lockdown. Indeed, one male participant said that playing games on his phone had stopped him from 'going mad' in his hotel room.

Despite this positivity, two participants expressed reservations about mobile phone ownership for moral and ethical reasons (although both said that they were happy to own a phone now that they were in the hotel). One man explained that he had always felt that it was 'wrong' to own a phone whilst he was begging, and another said that he objected to how phones were made:

> Not agreeing with where they [manufacturers] get the minerals from for their screens… making them illegally, illegal mines in Central Africa, and just promoting poverty and starvation and whatever… They ain't got no morals. (Stage 1, participant 33, Hotel A, male, aged 55 years, born in the UK)

Overall, participants at Stage 1 favoured smartphones over non-smartphones because of the former's greater functionality. Equally, they preferred mobile phones over larger devices, because they said that computers were too heavy to carry around, they could access a computer in a library, and/or they did not feel that they needed a computer if they had a phone. Nonetheless, several participants confirmed that they would like to learn more about computers and/or would consider getting a computer after being rehoused or when working again. Indeed, several participants recognised that computers and tablets had a range of advantages over mobile phones as their keyboards made them better for typing and video editing and they also had greater storage:

> A few things that I am doing, I would rather [have] an iPad… Because it's bigger and I can store things on it… Because sometimes, with my phone, I have to delete things on it, because… I can't use it without clearing everything… If I have that [an iPad], I wouldn't be doing that… I would store things inside there. (Stage 1, participant 09, Hotel A, female, aged 52 years, born outside the UK)

After moving out of Hotels A and B, most participants said that they continued to rely on their mobile phones. Again, several participants emphasised that their phone was their 'lifeline' and/or their 'connection to the world'. One participant, who reported that he was using an old phone because his hotel issued phone had been

stolen, explained how he had had no access to the Internet since leaving Hotel A and this disadvantaged him when applying for jobs as he had to physically walk around local hotels asking for kitchen work.

In addition, many participants at Stages 2 and 3, particularly those who seemed more stable in their move on accommodation, expressed a desire for better phones, additional devices, and improved connectivity. This included hopes for devices with larger screens (particularly for those with eyesight problems and those who wanted or needed to type), speakers (for listening to and making music), a PlayStation, a printer, and an Amazon Alexa (type of virtual assistant). Several participants also emphasised that they wanted, or hoped, to secure a tablet, laptop, or desktop computer in the not-too-distant future so that they could complete 'more serious' tasks, such as preparing their CV, completing government forms, job searching, 'getting organised', reading, and 'keeping busy'. By Stage 3, only one participant said that he had no interest in owning any devices besides his phone.

Discussion

There are notable consistencies between our findings and the extant international literature. For example, our participants tended to own relatively inexpensive (basic or smart) mobile phones, which were sometimes in poor repair or not fully functional and had frequently been gifted to them by others (Humphry, 2014; Neale and Stevenson, 2014). Despite this, most described themselves as being reliant on their phone and many said that they used it for a wide range of daily functions (Neale and Stevenson, 2014; Dorney-Smith and Gill, 2017; Calvo et al., 2019; Humphry, 2019; Moczygemba et al., 2021; Polillo et al., 2021). For the most part, participants seemed to have good basic mobile phone literacy. Nonetheless, participants' wider computing skills seemed less strong, with many reporting a desire to learn more and some adding that they would be interested in acquiring and using a computer once they were more settled (Neale and Stevenson, 2014; Polillo et al., 2021).

As also found in previous research, affordability was a major barrier to ICT engagement (Humphry, 2014; Neale and Stevenson, 2014; Doctors of the World, 2020; Good Things Foundation and Homeless Link, 2021). In practice, this was less of a problem at Stage 1 when everyone had access to reliable free WiFi within their hotel, but more of a constraint at Stages 2 and 3 after participants had moved on to new accommodation and credit from hotel-issued phones had expired. Whilst some participants relied on *ad hoc* financial support from friends, relatives, or charities, others said that they had phone bills they could not pay, and some had run out of credit so could only receive incoming texts or calls; resulting in periods of disconnectivity (Humphry, 2014; Gonzales, 2016; Polillo et al., 2021). Other

barriers to ICT use included slow WiFi connections, keeping devices charged, having to carry and store heavy devices, and theft, particularly whilst sleeping on the streets (Humphry, 2014; Neale and Stevenson, 2014; Good Things Foundation and Homeless Link, 2021).

The longitudinal design of our study facilitated some further insights. For example, the devices on which we had initially contacted participants were frequently not in service by Stage 3. Whilst this may reflect the poor quality and consequent short-life span of the inexpensive phones that our participants owned, it seems equally likely to relate to the difficulties participants experienced in paying for calls and data and keeping their devices charged. Additionally, our participants mostly preferred smartphones over non-smartphones and mobile devices over laptop and tablet computers, particularly at Stage 1. Yet, ownership of, and desire for, additional devices seemed to increase over the course of the study, especially after participants moved into more independent accommodation, seemingly highlighting latent ICT needs. Furthermore, ICTs were mostly used for communication and entertainment during the 'in hotel' Stage but employed for a wider range of more formal reasons, including 'organisational' and 'productivity' functions, at the 'move on' and 'post hotel' stages. This reminds us that devices serve different functions and choice of device is context dependent.

Our findings confirm the existence of digital inequalities rather than a simple binary digital divide (Lawson-Mack, 2001; Robinson et al., 2003; Gilbert et al., 2008). Thus, participants were not excluded from technology in any absolute sense. Rather, they had differential access to devices, data, charging points, storage, skills/knowledge, contracts, and tariffs. Moreover, these changed over time and place (for example, on the streets, in the hotels, and in their diverse forms of move-on accommodation). Equally, participants had differential access to wider physical and social resources (for example, supportive family or friends who would pay for credit or donate devices, ability to engage in paid work, or even good eyesight and dexterity for using small screens). As a result, participants experienced digital inequalities in relation to their resources and contexts, but these were not fixed, and digital inclusion could increase or decrease (if, for example, a device suddenly stopped working, a participant moved to new accommodation without reliable WiFi, or a service provider allowed someone to use an office phone).

The analyses we present also speak to theoretical literature on 'capital' (that is, the economic, cultural, and social assets that enable people to progress and achieve in society) (Bourdieu, 1977; 1985; 1986; Coleman, 1988; Putnam, 1995; Halford and Savage, 2010). According to Bourdieu (1977; 1985; 1986), capitals operate within contexts or 'fields' and have the potential to accumulate within that field and/or convert to advantage in other 'fields'. For example, within the context of homeless-

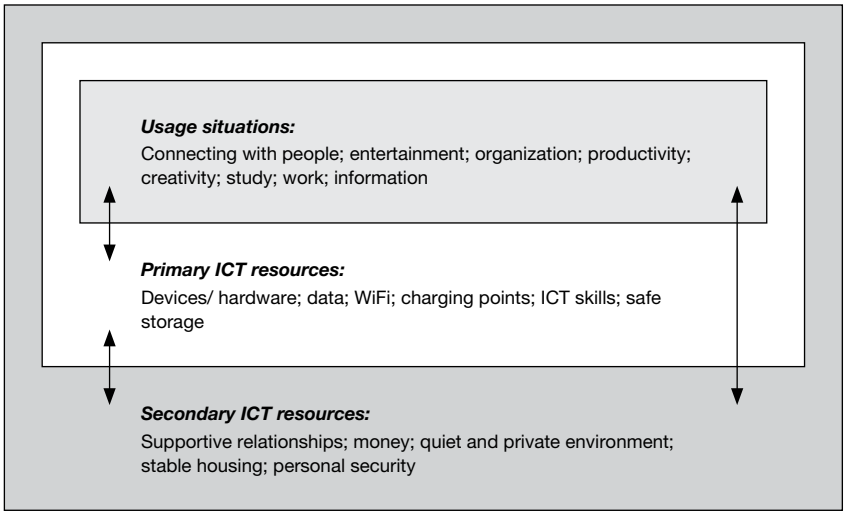
ness ('field'), ICTs ('capital') helped our participants to maintain relationships (generating 'social capital'); participate in education, travel, art, and poetry (generating 'cultural capital'); and apply for state benefits, organise their finances, and engage in paid work (generating 'economic capital') (cf. Parkin, 2013; Neale and Stevenson, 2014; Neale and Brown, 2016; Montgomery et al., 2020). In this way, the use of ICTs created additional capital that enabled our participants to manage their homelessness, but also produced benefits in other fields or contexts (such as, work, health, and immigration). In contrast, poor access to ICTs impeded participants' ability to deal with their homelessness and perpetuated their wider social, cultural, and economic marginalisation by diminishing their opportunities for social contact, meaningful activity, study, work, and engagement with professionals who might help them with health, housing, social care, and immigration-related needs. This appeal to the concept of capital is not to suggest that the use of ICTs is unambiguously positive; indeed, a few participants avoided social media because they were anxious about being identified by the Home Office, one was concerned about being addicted to dating apps, and some had accrued debts from phone bills. However, our participants' accounts clearly showed how the benefits of ICT use and engagement outweighed the negatives.

Beyond this, our findings can be linked to the interdisciplinary field of 'new materialism' and particularly to 'actor-network theory', which is a key strand of new materialism (c.f. Halford and Savage, 2010). As an approach, new materialism maintains that human and non-human phenomena are interconnected (rather than discreet) and, as such, their effects are contingent and variable rather than fixed or stable (Haraway, 1991; Coole and Frost, 2010; Braidotti, 2013; Fox, 2016). Thus, ICTs (such as mobile phones, computers, and technological infrastructure and availability) are physical but simultaneously social, cultural, historical, and political. ICTs do not exist independently of the humans who use them, the places and times they are used, and the reasons they are used. Accordingly, and as our data revealed, the properties of any device are affected by multiple interrelated factors including its cost; how easy it is to charge and store securely; the functions it performs; to what extent those functions are a deemed a priority by the end user; and the financial and wider life circumstances of that end user. Furthermore, the use of ICTs, in turn, affects other human and non-human phenomena, such as relationships, employability, income, the ability to contact doctors and solicitors, and the potential to acquire other technological devices (Latour, 1991; Halford and Savage, 2010; Humphry, 2019).

These theoretical approaches have their respective strengths and weaknesses and require further empirical investigation which we leave for future studies. Until then, we have brought our findings together into one simple visual model that we hope will be of interest and use to those who wish promote ICT engagement amongst

people who are experiencing homelessness with more immediate effect (see Figure 1). At the core of this model are 'usage situations': the activities we understand that people who are experiencing homelessness want to perform using digital devices: for example, staying in touch with family, friends, and services; finding entertainment; being organised, productive, or creative; studying; working; and accessing information. Surrounding this are the 'primary ICT resources' needed to complete the desired activities. These will include devices and other hardware; data and/or WiFi; charging points; ICT skills; and safe storage. Finally, and external to this, are 'secondary ICT resources' which comprise the infrastructure that enable people to meaningfully use the primary resources to complete the desired ICT activities. These will likely include supportive relationships, money, a quiet and private environment, stable housing, and a degree of personal security. Our findings suggest that these three spheres operate in a dynamic and interactive way with increases in one potentially generating benefits in the others.

Figure 1: Facilitating ICT engagement amongst people experiencing homelessness



Limitations

Our study was conducted at short notice, during a pandemic, and with almost no funding. As such, the data we have generated and analysed have limitations. Most obviously, our participants came from only two (and mostly from just one) Everyone In hotel in London. In addition, they had specific demographic characteristics (predominantly single men; most born overseas; all able to read and speak basic

English; and all in possession of, and able to use, a mobile phone). We cannot therefore claim that our sample is representative of all people accommodated by Everyone In or all people experiencing homelessness in the UK during the pandemic. Furthermore, only 13/35 (37.1%) of our original study participants were reinterviewed at Stage 3 and the balance of participants' demographic characteristics had changed by this point; meaning that those participating at the end were not necessarily representative of the initial study sample.

Although many of the mobile phone numbers used in the Stage 1 interviews were no longer in service by Stage 3, we cannot definitively conclude that we lost participants to follow up because they no longer had a working mobile phone (since we do not know how many had simply secured a new phone or number). After nine months, we had lost contact with 10 of the 14 participants who had been given a mobile phone in Hotel A. Nonetheless, we successfully reinterviewed four, of whom two were still using their hotel-issued phone (so demonstrating the ongoing utility of some of the phones distributed). Although engagement with ICTs was not the focus of our research, we generated a significant amount of data on the use of devices and technology by people who were homeless, including many who had uncertain immigration status and who would have otherwise been difficult to identify and interview. This has enabled us to generate insights that add to the existing literature. Moreover, by relating our analyses to broader theoretical approaches and by presenting a simple model of ICT engagement, we hope that our findings have transferability to other settings and might be of interest to others working in this field.

Conclusions

As society becomes ever-more digitalised (a phenomenon accelerated by COVID-19), those who do not have access to ICTs will likely find themselves increasingly isolated, and without access to critical support networks (including health and social care, and other professional services) and opportunities for social participation (Sinclair and Bramley, 2011; Humphry, 2014; Park and Humphry, 2019; Polillo et al., 2021). Our data reveal the potential benefits of a policy initiative that included distributing free mobile phones to people experiencing more extreme forms of homelessness. These include opportunities for communicating with family, friends, and professionals; entertainment/alleviation of boredom; and completion of a wide range of essential life tasks and activities, such as study, job searching, and applying for benefits and housing. Nonetheless, we also found that providing a mobile phone in the absence of wider ICT infrastructure (including accessible WiFi, charging facilities, safe storage, and ICT training) limits any lasting benefits. Equally,

giving a phone to someone who is experiencing homelessness, but does not have other resources, such as supportive relationships and a stable and safe environment, will also weaken what can be achieved.

The phones provided within the Everyone In hotels were undoubtedly an important element in the success of the initiative (The Kerslake Commission, 2021). However, the devices themselves were not discreet interventions. Using the language of new materialism and actor network theory, mobile phones function as part of a wider dynamic ICT 'network' or 'assemblage' (including both the primary and secondary ICT resources we have identified). This helpfully reminds us that organisations can facilitate ICT engagement amongst people experiencing homelessness, even if they are not able to donate devices. For example, health centres, hospitals, libraries, transport hubs, shopping malls, and cafés can all contribute at little or no cost to themselves by providing free WiFi and access to charging points. Additionally, homelessness service providers, such as shelters and day centres, can offer lockers for storing devices; access to desktop, laptop, and tablet computers for activities that require larger screens and keyboards; and ICT training and support to those who want to learn more (Polillo et al., 2021). Lastly, and more ambitiously, innovative partnerships between those working in the homelessness sector and telecommunications companies can, and have already begun to, generate valuable hardware and infrastructure, including devices, data, and connectivity (Humphry, 2019; Polillo et al., 2021; Tesco Mobile, 2021).

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