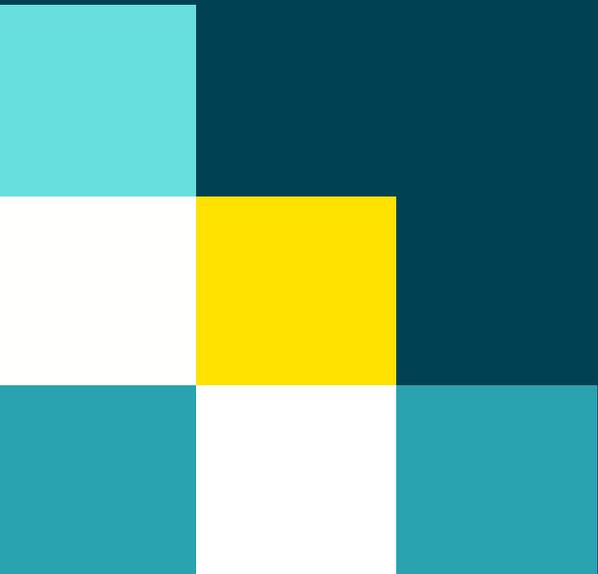




**Wales Centre for Public Policy**  
**Canolfan Polisi Cyhoeddus Cymru**

# Designing technology-enabled services to tackle loneliness

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# Summary

- Tackling loneliness was a priority for Welsh Government and public services across Wales before the Coronavirus pandemic and has become a greater concern since.
- Early evidence suggests that those at greatest risk of loneliness before the Coronavirus pandemic have become lonelier and there has been a considerable increase in the numbers of people who are sometimes lonely
- The measures introduced to manage the Coronavirus pandemic have presented us with a unique set of circumstances, wherein the experience of loneliness is increasing at the same time that the usual strategies of governments and public services to tackle it are compromised.
- There is very limited robust evidence about what works to tackle loneliness, including the use of technology. We know that technology isn't a substitute for face-to-face interaction and that whilst it may be a useful tool, it cannot replace in-person services.
- Nevertheless, interventions that both pre-date and have been introduced in response to the pandemic highlight some key design principles that might improve the effectiveness of technology-enabled provision to tackle loneliness and social isolation.
- The evidence points to a number of important design principles to consider when developing or adapting services that use technology to tackle loneliness.
- Some of these principles relate to *what* you do including; prevention of loneliness through maintaining existing social connections; building new connections built on meaningful activities or shared interests; enabling peer support; and fostering intergenerational connections.
- Others relate to *how* you do it including: ensuring services are co-designed and co-managed with users; building on pre-existing community assets; enabling access to technology; using a tailored communication format; and deploying a range of support strategies.

# Introduction

The policy response of governments across the world that are dealing with the Coronavirus pandemic has focused on us all keeping a physical distance from others. There is growing concern about the effect of physical distancing policies – often referred to as social distancing - on loneliness and social isolation. Technology may offer individuals, families, friends, and communities some potential means to mitigate these effects. The experience of loneliness can be highly distressing and the mental and physical health effects are extremely serious. Research shows that loneliness increases risk of depression, cognitive decline and dementia, as well as high blood pressure, coronary heart disease, stroke and increases risk of death by 26% (Campaign to End Loneliness, n.d). This report provides a synthesis of research relating to interventions that make use of technology to combat loneliness and social isolation. For the purposes of this report we adopt a broad definition of technology, that incorporates simple and highly accessible technologies such as telephone and radio, as well as digital technologies such as devices and platforms that require an internet connection.

While related, loneliness and social isolation are different concepts. Loneliness is the subjective feeling of being alone and reflects a person's feelings about the quality of their relationships. Social isolation reflects the quantity of relationships a person has (de Jong Gierveld et al., 2006). Social isolation may, for some people, lead to loneliness, but tackling loneliness is not simply a matter of increasing the number of social connections or opportunities for social interaction that a person has. Those connections and interactions need to meaningfully change that person's subjective feeling of loneliness (Campaign to End Loneliness, 2020b; Campaign to End Loneliness, 2020c).

The aim of this report is to distil some of the core features of how technology-enabled interventions have been designed to enable meaningful social interaction. As we learn to live with the implications of the Coronavirus pandemic and adjust to new 'normal' ways of life, these design principles may help policy makers and public services, in Wales and beyond, to develop effective technology-enabled services to instigate and maintain familial, friendship and community connections. Such services will be vital for alleviating feelings of loneliness and enhancing wellbeing.

## The challenge

The various restrictions and social distancing measures that have been introduced to slow the spread of the Coronavirus have affected our social interactions in many ways, with the potential to significantly impact on the prevalence of loneliness and social isolation. These restrictions have been unprecedented, and have included government instruction to stay at home and/or shield, bans on households mixing, the closure of schools, colleges, universities and many workplaces, the introduction of 2-metre or 1-metre plus distancing and significant restrictions on visiting care homes and hospitals. One consequence of these restrictions has been that many of the services that aim to mitigate the experience of loneliness have been unable to operate, or have had to adjust how they work where face-to-face interventions are not viable. In short, the Coronavirus pandemic has presented us with a unique set of circumstances, wherein the experience of loneliness is likely to increase at the same time that the usual strategies of governments and public services to tackle it are compromised.

As the rules about lockdown restrictions and social distancing evolve through different stages of the pandemic, different groups will be subject to different guidelines about the extent to which they can connect with others in person. Throughout these stages, technology has increasingly been and will continue to be an important option for services and interventions seeking to address loneliness and social isolation.

## Loneliness in Wales

In results from April 2019 to March 2020, the National Survey for Wales (2020a) found 15% of people in Wales were lonely, with 51% sometimes lonely. 9% of those aged 75 and over were lonely compared with 20% of 16-24 year olds. 19% of non-white people were lonely compared with 15% of white people and 41% of people in material deprivation were lonely compared with 12% of those not in material deprivation. Other important factors impacting on the experience of loneliness include marital status, health and wellbeing and a range of community factors such as satisfaction with local area and feeling safe after dark.

At this stage, we have limited evidence about the impact of the Coronavirus pandemic on loneliness in Wales. Monthly survey data collected since May 2020 (National Survey for Wales, 2020b) shows that the proportion of people who are lonely has fallen (from 15% to 11-12%) but the proportion of people who are sometimes lonely has increased, from 51% to between 75% (in June 2020) and 64% (in August 2020). The UCL UK wide Covid-19 weekly social study (Bu et al, 2020a) found that whilst loneliness overall did not change during the first six weeks of lockdown, loneliness increased for those who were experiencing the highest levels of loneliness before lockdown. This finding is supported by the experience of organisations supporting those most at risk of loneliness in lockdown and beyond, who report increased levels of mental distress among vulnerable people (Campaign to End Loneliness, 2020a).

Research from the Office for National Statistics (2020) found that whilst chronic loneliness does not appear to have changed significantly as a result of lockdown, the equivalent of 14.3% of the Great British population reported that their wellbeing had been detrimented as a result of feeling lonely during the pandemic. This group has been termed the 'lockdown lonely'. Those more likely to be 'lockdown lonely' include adults living alone, those who are single, widowed or divorced, those who report being in bad or very bad health and those in rented accommodation. Similarly, the British Red Cross (2020c) found people were experiencing loneliness more often as a result of the pandemic and that the restrictions have impacted their strategies for managing loneliness. This has led to an increased reliance on technology and entertainment rather than physical social interactions, that will continue to be important in the current context.

## How technology has been used to respond to loneliness during the pandemic

Technology has been a powerful tool during the Coronavirus pandemic, enabling us to connect with others where face-to-face contact is not possible. At the outset of the pandemic, various experts and organisations highlighted the potential role of technology in helping us all to stay in touch with family and friends, for example via telephone or video conferencing, and keep up activities that we enjoy and have meaning for us, such as participating in online book clubs or exercise classes and attending virtual gigs or lectures (Hwang et al. 2020; Mental Health Foundation, 2020; British Red Cross, 2020a).

The WCVA have described the rapid adjustment of the voluntary sector in Wales to the use of digital technology to deliver services (WCVA, 2020a; WCVA, 2020b), and the various ways these technologies have been used during the pandemic, including to coordinate volunteering; deliver advice services and provide wellbeing support by phone or video conferencing; and using social media to connect (Stone, 2020).

Similarly, work by the British Red Cross (2020b) describes how services to tackle loneliness and social isolation have switched from in-person to telephone and online contact. They highlight a number of challenges of tackling loneliness during the pandemic including people reporting that telephone contact was less satisfying than in person contact, lack of face-to-face contact making it more difficult for support workers to assess causes of issues as well as greater need for mental health and wellbeing support, and the challenge of digital exclusion particularly for people using refugee services.

## The challenges of using technology to respond to loneliness during the pandemic

The Coronavirus pandemic has highlighted the importance of digital inclusion in a number of ways, including the extent to which the use of technology to address loneliness and social isolation is reliant on access to devices, as well as having the skills and knowledge to use them, and the financial resources to stay connected. The WCVA (2020a) report both benefits and challenges experienced in the use of technology by the voluntary sector during the pandemic. They raise the issue of digital exclusion, which disproportionately affects some – often vulnerable – groups (such as the elderly or those on low income) more than others, and highlight that service adaptations, developed at a pace, should now be reviewed to ensure they are working for and with service users and are financially sustainable. Whilst not all technology-enabled services rely on digital tools, access and skills, many of them do, or may be enhanced as a result, and as such digital inclusion is vital to ensuring equitable access.

A substantial number (10%) of adults in the UK do not use the internet and 19% of the population in Wales do not have basic digital skills (ONS, 2019). In 2018, Wales had the highest proportion of those with zero basic digital skills (19%) and the lowest proportion of people with all five basic digital skills (66%). Office for National Statistics (2019) figures highlight some of the ways in which digital exclusion impacts different groups including older people, disabled people, the economically inactive, those on low incomes, and those who live alone. In 2018, among the working age population, the economically inactive were most likely to be internet non-users, particularly those adults on long-term sick leave or disabled. The most common reasons people gave for not having internet access included that they didn't need it (64%) and a lack of skills (20%). The majority (76%) of those with zero basic digital skills were over 65.

Issues of digital exclusion - due to a lack of access (for example, to broadband services in rural areas), financial resources to pay for data, and/or a lack of skills and confidence to use technology - are commonly raised as a barrier to the use of technology as a means to mitigate feelings of loneliness. Other issues raised include the need for technologies to be improved, for example by being more evidence-based and 'person-centred' (for example, designed with and for specific users and incorporating opportunities for peer-support) in order to more effectively tackle loneliness (Wu, 2020).

## What works to tackle loneliness and the role of technology: what we know and the limitations of the evidence base

In general, there is limited evidence about what interventions work for tackling loneliness and social isolation. In 2018, What Works Wellbeing published a comprehensive review of interventions to tackle loneliness and social isolation. The findings were tentative and largely focused on older people. Their work highlights the importance of tailored interventions, approaches that avoid stigma and the importance of creating opportunity for meaningful relationships. Most of the interventions relied on social groups and activities. More recently, the Campaign to End Loneliness published their updated guide to the different types of activity that are needed to tackle loneliness – from services providing loneliness interventions to connection services that link people to that provision, as well as the infrastructure and system-level conditions that underpin tackling loneliness and foster connected communities. They provide examples of “promising approaches” for each of these types of activity (Campaign to End Loneliness, 2020b). In the context of the Coronavirus pandemic, they highlight the increased importance of digital access, to facilitate an increased role for technology.

Prior to the pandemic, research on the role technology can play in tackling loneliness has - explicitly or implicitly – tended to judged interventions that utilise technology against those that promote face-to-face contact and found technology to be a poor substitute. Many important elements of communication and connection – such as nonverbal cues and touch - are more difficult or not possible online (Lawson et al 2014; Kruger et al 2005; Nie 2001). More recent research suggests that technology works best to relieve loneliness and social isolation where it is used to enhance relationships rather than displace face-to-face social interaction (Nowland et al, 2018).

However, the existing literature does not reflect our current circumstances where face-to-face interventions are not always viable. There is little evidence that develops our understanding of *how* technology functions to facilitate services that effectively support social connectedness or what about the *design* of that technology-enabled service helps people feel meaningfully connected to others. Not all uses of technology are the same and social distancing restrictions mean it is increasingly important that we develop our understanding of what makes technology work well in different settings.

This report builds on our briefing on loneliness in lockdown (WCPP, 2020) and outlines the key design principles of interventions that utilise technology to tackle loneliness and social isolation and provides examples of these.

# Design principles

The literature points to some key components or design principles that can be applied to technology-enabled interventions for loneliness. Some of these principles relate to *what* you do and others relate to *how* you do it. We describe each of these design principles and the evidence relating to them in more detail below and provide examples of interventions that apply them.

## Our approach

It is too early to draw conclusions about the role technology has played in preventing or tackling loneliness and social isolation during the Coronavirus pandemic. However, examples of interventions that have emerged may offer insight into what technology needs to be able to do to meaningfully address loneliness and how it can best be deployed to achieve this. Furthermore, there have always been groups that have experienced greater social isolation (due to, for example, caring commitments or poor health) and for them technology has offered vital means to maintain and enhance social connections long before social distancing restrictions. Understanding how technology-enabled interventions have been designed to support these groups stay connected and alleviate loneliness may offer vital insight into how we can design or adapt services in response to the conditions imposed by the Coronavirus pandemic.

For this report we searched academic literature and publications from public and third sector organisations to identify technology-enabled interventions that have sought to tackle loneliness. We did not restrict the search to interventions targeting any specific groups. However, we only include examples that detailed the design features of the technologies used. From these studies we extracted common or key design principles that are set out in the following sections, along with some examples from cases where these have been applied.

We found few examples of rigorous, independent evaluations of the impact of technology-enabled interventions on loneliness, and a large proportion of the studies retained presented small-scale self-evaluation. There is therefore a lack of robust evidence about the effectiveness of these interventions. However, our focus here is on the insight these studies offer on design principles; what the technology-enabled interventions are seeking to do and how they seek to do it. Further trial and evaluation of intervention that apply these principles would consolidate knowledge on the link between technology design and effectiveness for tackling loneliness. To aid reading of this report we use the following symbols to indicate the type of evidence we draw on in the following sections:

**Figure 1: Key**

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	<p><b>Systematic reviews</b></p> <p>Systematic reviews assess the quality of many intervention studies and synthesize their findings. They are a strong form of causal evidence.</p>
	<p><b>Interviews, Focus Groups and Surveys</b></p> <p>Studies conducted by independent researchers including interviews, focus groups and surveys. Such studies cannot conclusively determine whether the intervention has had a positive impact.</p>
	<p><b>Self-evaluation</b></p> <p>Organisations delivering an intervention may generate their own learning by reflecting critically on the successes and challenges of the intervention.</p>

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## What you do

### Prevention of loneliness through maintaining existing social connections



Maintaining existing connections and relationships is key to preventing loneliness and social isolation and shouldn't be overlooked in favour of building new connections. One study found use of the internet to communicate with existing family and friends reduced loneliness for older people but using it to find new friends increased emotional loneliness (Sum et al, 2008).

There are a range of simple and mainstream technologies that can be utilized to maintain existing social connections when face-to-face is not possible, ranging from the telephone to Facebook and Whatsapp to Amazon Echo and Alexa (British Red Cross, 2020c).

Barcelona's **Vincles** app is a care platform where individuals can communicate via text message, photograph or video. Users can invite up to ten friends, family and neighbours to be part of their personal network and also have access to a group network that is made up of other users who live in the same area and/or have interests in common. In some cases, existing mainstream technologies such as Alexa may be more user friendly and inexpensive than specialist platforms (Wright et al, 2020).

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## Example: Circle

### The Intervention

Circle is an early (pre-Coronavirus pandemic) example of a community asset-based approach to supporting people with a range of needs, including with loneliness and social isolation. This example illustrates how simple technology such as telephone can be utilized and how non face-to-face interventions and tools can be combined with face-to-face interventions. Members pay a small yearly subscription and get access to a free phone number, a local monthly social calendar and practical support. A small local team respond and connect members to each other. Support is provided by members themselves and paid helpers. The first Circle was established in Southwark London in 2007 Since then regional Circles have been developed for example in Nottingham and Rochdale. Each circle was run as a social enterprise which employs around 5 people and was led by a full-time director.

### Learning

It was developed based on a co-design process where it was identified that participants did not want to see themselves as needy and did not want a traditional service. As such, it's a community-based approach that aims to foster a core set of capabilities by fostering relationships and active contribution.

Circle has been independently reviewed and evidence suggests its effectively reduced social isolation as well as other social and health outcomes and unnecessary use of statutory services. Attracting people in their 50s and 60s was a key factor in building a community with the strength to support older and frailer members. An externally verified survey of members of [Heywood, Middleton and Rochdale Circle](#) found 71.6% reported making new friends and 79.9% reported increased social activity since joining Circle. However, in 2014 the London Circle closed as a result of lack of funding (Cottam and Dillon, 2014).

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**Provide opportunities for connections offering meaningful activities or developing shared interests**



Much of the literature on interventions to tackle loneliness emphasises the importance of enjoyment and connecting over meaningful and interesting activities (Campaign to End Loneliness, 2020b). In their review of reviews, What Works Wellbeing (2018) found that there was some positive evidence for the effectiveness of interventions involving gardening, music and physical activity. Similarly, SCIE (2012) find that group-based schemes to tackle

Loneliness are especially effective where activities are creative, therapeutic or discussion-based.

These principles can also be applied to technology-based interventions. Barnado's have developed an online cooking club for care-experienced young people. As well as facilitating social connections, the club provides an opportunity for the members to develop meaningful life skills (Catalyst 2020b). Alzheimer Society 'Singing for the Brain' music groups bring together people with dementia and their carers in tailored groups to share music, socialize and offer peer support. Following the Coronavirus pandemic, these groups are now offered via Zoom with song lyrics on screen and breakout groups to enable people to chat informally (Campaign to End Loneliness, 2020b).

A review of digital interventions to tackle loneliness among older people, highlighted the importance of reciprocity and recommends that interventions go beyond simply getting older people online, to facilitate meaningful interaction (Sharma et al., 2015). Examples of the value of reciprocity include **SpeakingExchange**, an initiative which connects older people with students looking to improve their English-language skills.

### **Provide means for enabling peer-to-peer support**



Where interventions are targeted at specific groups, it may be beneficial to include an element of peer support. Qualitative research with carers and young mothers found that these groups viewed peer support as an effective method to reduce loneliness. Carers felt that peer support sessions provided a 'safe space' to share their experiences of caring for loved ones (Long et al., 2017). Similarly, new mothers felt that connection with others facing the same challenges was important, but sometimes felt this could be difficult due to the fear of being judged (Lee et al., 2017).

An important consideration for approaches based on peer support is training and support for peer supporters themselves. The children's charity Barnado's have reflected on the challenges of supporting young people to deliver peer support during the COVID-19 pandemic. They have suggested that online support groups are muted between certain hours and have introduced debriefing sessions with an increased focus on play (Catalyst, 2020a). AV1 is a telepresence robot developed for children who are unable to attend school due to long term illness to maintain their connections to school and enable peer social interaction (No Isolation, 2020).

## Encourage intergenerational connections fostering intergenerational solidarity



Intergenerational connections bring together people from different generations for mutually beneficial activities. A review found intergenerational interventions have the potential to reduce social isolation, challenge stereotypical attitudes, foster friendships and relationships and increase understanding and that embedded, longer-term interventions make the greatest contribution (Bryer and Owens, 2019).

The **Digital Heroes** project recruits children through schools and other community groups to provide digital inclusion support to older people in their community. The project is delivered by the Wales Cooperative Centre as part of the Welsh Governments Digital Communities Wales project.

## How you do it

### Co-design and co-management of services



Co-design is the practice of engaging service-users in the design of services, going beyond consultation to more active forms of participation. The co-design of interventions can help to ensure services are well-tailored to the target group and users are engaged as active participants. The Loneliness in the Digital Age project mapped the responses of different groups to loneliness and developed potential digital interventions to help manage those experiences. A key tenet of the project was the priority given to engaging with service users throughout the process – designing the intervention ‘with’ rather than ‘for’ them.

Some interventions have gone further than this and proactively engage users in the management of the service. Circle, a community-based membership organisation for people over 50 (described in more detail above) provides an example of this approach. Circle aims to provide support for practical needs as well as foster relationships and active contribution. Boundaries between staff, helpers and members are blurred and members take on an active role in the delivery of the service.

### Builds on pre-existing community assets, services and partnerships



Interventions and services that build on existing community assets and networks are a key feature of some interventions, but their overall effectiveness is not known (What Works Wellbeing, 2018). Linking to existing services and partnerships has the potential to reconnect people to their communities and networks, as well as enable services to reach more people.

A few interventions of this kind such as community gatekeepers and signposting services have been found to be effective (What Works Wellbeing, 2018).

**Caerphilly Council** has Community Connectors who work to re-connect people with their communities, linking people who have similar interests and helping them find suitable activities. As part of their digital first approach to public health, **Essex County Council** have built relationships with admins of local Facebook groups to provide support, training and funding including for example mental health first aid and suicide prevention training.

### Enabling access to technology and skills



The capacity of individuals to access and use technology safely is crucial to ensuring remote interventions are effective. Given the persistence of digital exclusion, technology-based approaches could risk reinforcing isolation without appropriate assessment of the capabilities of service users (What Works Wellbeing, 2018).

One approach is to focus on simpler technologies that are easier to adopt. A recent systematic review found that providing technology that is simple and easy to use has positive outcomes for older people (Ibarra et al., 2020). This could be achieved by using analogue technologies such as radio and landline telephones. The Radio Heroes project established by **WaveLength**, distributed free DAB radios to over 4,000 older people experiencing social isolation. Other interventions have focused on increasing the capabilities of users to access and use digital support services. The **DevicesDotNow** initiative distribute digitally-enabled devices through community partners which provide wrap around digital skills support.

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## Example: DevicesDotNow

### The Intervention

**DevicesDotNow is a collaborative initiative of Nominet, Good Things Foundation and FutureDotNow delivering internet-enabled devices to digitally excluded individuals and families across the UK. The devices are distributed through a network of community organisations such as libraries and housing associations and are pre-loaded with data and apps focusing on wellbeing and digital skills. Wrap around digital skills training is also offered by the community partners through phone and video chat, covering topics including basic internet skills, being safe online, using essential services and connecting to families and friends.**

To be eligible for the scheme, households must be on a low income, digitally excluded and either over 70, disabled, or without a local support network. 25% of recipients are also medically vulnerable. Established in the early stages of the Covid-19 pandemic, the schemes aims to support those at greatest risk of hardship and digital exclusion and enable community partners to continue providing support remotely.

## Learning

Over 11,400 devices and data packages (dongles, SIM cards and mobile hotspots were distributed from March to July. The scheme has been successful in targeting support to communities most in need, drawing on the diverse network of community partners through Good Things Foundation's existing 'Online Centres Network'. Early evaluation found that 54% of the community partners are located in the 20% most deprived areas in the UK and 51% are located in the 20% of areas with the largest proportion of Black and minority ethnic (BAME) residents.

The effectiveness of the intervention has been assessed through feedback and discussions with community partners. 80% of people who received devices reported feeling more confident and 89% reported that the intervention has had a positive impact on their life during lockdown. Other benefits reported included: greater social connectedness and wellbeing, support with money and benefits (such as being able to manage Universal Credit payments online) and helping adults and children to keep learning. Some recipients also reported that the device acted as a 'circuit breaker', helping them to resolve challenges before they compounded into a vicious cycle.

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### Tailored communication format



Communication format (such as voice or text, real time or asynchronous) can impact the potential for people to engage. Tailoring the approach to meet a range of needs is key.

Interacting using technology brings additional challenges as key aspects of communication such as active listening and conveying emotion are more difficult to achieve. For this reason, **voice and video messages** and calls may be more suitable forms of communication for interventions tackling loneliness in some cases. Carers participating in a co-design workshop reported that communicating through social media could sometimes exacerbate feelings of loneliness if friends are not online or messages read but not responded to. Instead video and audio communication was preferred (Long et al., 2017).

**Asynchronous communication** is where communication can happen intermittently rather than in real time or in a steady stream, for example, through recorded voice notes instead of a 'live' phone call. For those with limited time and unpredictable schedules such as carers and new parents, asynchronous communication provides the benefits of voice in a format that is flexible to their needs. However, the challenge is to design these to still evoke a sense of a conversation (Long et al., 2017).

**StoryCorps Connect** was started in March 2020 in response to the Coronavirus pandemic and is a platform where people can upload and share interviews for archive. StoryCorps is a non-profit in the USA that aims to preserve and share human stories to build connections. People record interviews about their lives or are connected to interview others. They have different projects including a project that links people who do not agree, a project aimed at helping children cope with the death of loved one, and a project to preserve stories of refugees and asylees. They report 81% of participants felt more connected to interview partners and 78% better understood each other. In online listeners, 89% reported that listening made them feel connected to others.

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## Example: ChatR

### The Intervention

**ChatR is a radio-like device for carers. Carers audio record pieces of advice, news and stories and broadcast them to a closed network of other carers, and others in the network can record a response or send a heart to show their support. There are separate channels for different types of content such as advice, news, pick-me-ups and music. The device was designed with input from carers in design workshops (Long et al, 2017) which found that carers had very limited freedom over their time. This fed into the decision to make interaction through ChatR asynchronous (not occurring at the same time) as carers might not be able to commit to scheduled interactions. Carers also reported having limited opportunities for social interaction, yet they particularly valued opportunities to connect to other carers with similar experiences. This finding influenced the audio-based channel approach, which allows carers to simply talk to other carers and access peer support as well as practical advice. The service also includes a music channel with songs chosen by the carers, enabling connection over an enjoyable activity.**

### Learning

**ChatR was piloted with carers over a two-month period, which highlighted appreciation of being able to hear the voices of other carers, with listening carers**

finding themselves compelled to respond to the posted audio of other carers seeking advice and help. The asynchronous qualities of the system were also appreciated, with carers using ChatR at very different times of the day and with diverse patterns across the weeks. However, while enthusiastic for ChatR, carers stressed how they considered it important that the peers they spoke with via the system were people they already had some “offline” familiarity with (i.e., through prior carer support groups and services). The researchers also noted how discussion between carers would have benefitted from explicit prompting or facilitation (i.e., by a support worker, or in this case a research team member), highlighting how the technology on its own could not act as a solution to the issue of loneliness amongst this group.



**Wide range of support strategies deployed**

Experiences of loneliness and social isolation vary considerably meaning a range of support strategies are needed. One study highlighted the multiple strategies used by students to cope with experiences of loneliness associated with the transition to university (Vasileiou et al, 2018) which were dependent on specific contextual factors of the persons environment, social resources and individual needs. Strategies included distraction, support-seeking and contact seeking, including using technology to communicate with geographically distant social ties. This example illustrates the importance of providing a range of support options for healthy coping strategies to meet the range of needs and contexts of people experiencing loneliness and social isolation.

**Table 1: Design principles**

Design Principle	Evidence	Rationale (that emerges from the examples)
<b>WHAT YOU DO</b>		
Prevention through maintaining existing connections		Maintaining existing connections is key to preventing loneliness and social isolation.
Connections based on meaningful activities and shared interests		Conversations or connection over an area of interest or activity is more fulfilling than small talk or checking-in.

Peer-to-peer support    For some groups, such as carers, it is particularly important to connect with others who have relevant lived experience.

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Inter-generational connection  Intergenerational interventions have the potential to reduce social isolation, challenge stereotypical attitudes and foster friendships.

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### HOW YOU DO IT

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Co-design and co-management    If interventions are not designed to take into consideration the needs of the target group they are less likely to be effective. People often prefer to actively and equitably participate in a service rather than be a passive recipient. This may also reduce the perception of stigma surrounding loneliness.

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Builds on pre-existing community assets and partnerships   This could reconnect people to their communities and enable services to reach more people.

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Enabling access to technology and skills  Many people are digital excluded. Older people and low-income families are particularly at risk.

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Tailored communication format    People rely on different communication formats to enable them to engage. Video and voice are closer to face-to-face interaction and convey greater emotional information.

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Wide range of support strategies deployed  People rely on lots of different coping strategies to manage loneliness so a range of support services will be most effective.

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# Conclusion

It is too early to draw firm conclusions about the impact of the Coronavirus pandemic on loneliness and social isolation. However, early research suggests social distancing measures have exacerbated loneliness for groups already at risk and heightened feelings of loneliness among many more; the lockdown lonely. Loneliness was a policy priority before the Coronavirus pandemic, as a result of increased recognition of the far reaching detrimental implications of loneliness, for example on our mental and physical health.

As well as impacting on loneliness itself, the restrictions in place as a result of the pandemic impact the ability of governments, as well as public and third sector providers of services to respond. Whilst face-to-face and community-based interventions to combat loneliness are preferred, these may not be possible for many of us for some time. Technology is likely to continue to be part of the mix of provision, and an increasingly useful tool as services continue to adapt to varying and changing restrictions on social interaction for different groups. However, very little is known about what is effective in tackling loneliness and social isolation and even less is known about the effectiveness of technology-enabled interventions.

Drawing on the limited evidence that is available, this report sets out some key principles to guide what technology-enabled services should seek to offer and how they should be designed to combat loneliness. This evidence suggests that technology-enabled services should seek to: prevent loneliness by maintaining existing social connections; facilitate new connections through participation in meaningful activities based on shared interests; enable peer support; and foster intergenerational connections. To do this, technology-enabled services should be co-designed and co-managed with users and built on pre-existing community assets. In addition, they should ensure access to technology; use a tailored communication format; and deploy a range of support strategies.

The design principles we outline are mostly drawn from an assessment of approaches taken by technology-enabled services that existed for some groups prior to the Coronavirus pandemic. Given that, for those at highest risk, loneliness has been exacerbated by the pandemic, the examples we present will continue to be relevant to tackling loneliness during the pandemic and beyond; for example for groups such as carers, new parents and those experiencing poor mental and physical health. However, for groups such as the lockdown lonely, there may be a need to adapt some of these principles to ensure their relevance to potentially different sets of needs. The importance of co-designing and, where possible co-managing services with users may be amplified to ensure user need drives technology-enabled service design, both in terms of what these services offer and how they work. Furthermore, there is a need to recognise that for those experiencing the most chronic forms of loneliness and for those that are most digitally excluded, there may be additional

considerations associated with both the nature of the support they need and the manner in which that support should be offered. Indeed, for most people technology shouldn't be seen as a substitute for face-to-face social interaction or a replacement for in-person connections. It may, however, be a useful tool, and the design principles we outline provide a baseline from which to trial and test approaches for harnessing technology to combat loneliness throughout the pandemic and beyond.

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