

## Beyond The Virus: Bridging the Digital Divide in a Post – Pandemic World

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### ABSTRACT

Because there are more than three billion people living in isolation, the status of digital spaces is shifting from that of an amenity to that of a necessity. This is because digital spaces are not only becoming the primary means by which people can access information and services, but they are also becoming one of the only remaining vectors for economic, educational, and leisure activities, as well as for social interactions to take place. Yet, not everyone has the same level of access to networks and connected devices, and not everyone possesses the abilities necessary to navigate digital areas in the most effective way. Inequalities in the digital realm were always there, but the COVID-19 problem is substantially worsening the situation. One effect of the crisis will be to exacerbate existing digital inequities within the population. On the other hand, digital disparities represent a major risk factor that increases a person's vulnerability to exposure to the virus itself as well as the non-sanitary effects of the crisis. As a result, the purpose of this article is to investigate the ways in which the COVID-19 issue and digital disparities have mutually reinforcing effects, and to provide workable solutions that can assist in the battle against the negative effects that the crisis has had. In the first part of this article, we will discuss how digital inequalities affect people's health. Next, we look into how COVID-19 can make digital disparities worse, as well as how digital inequalities make people more susceptible to COVID-19. In conclusion, in order to make a contribution to the reduction of the severity of this crisis, we propose a collection of multi-layered strategies with a primary emphasis on their applicability. These strategies can be put into action at a variety of structural levels, ranging from the level of the government to that of corporations and communities.

**Keywords:** COVID-19, Vulnerability, Social Interactions, Reinforcing Effects

### INTRODUCTION

In the course of human history, mankind has previously been exposed to a number of pandemics, including the Great Plague and the Spanish Flu (Taubenberger, Kash, & Morens, 2019; Hays, 2005). Yet, the COVID-19 pandemic is one that has never been seen before for at least two different reasons. To begin, the scale and scope of the problem is unprecedented, given that there were over three billion incarcerated individuals on the planet at the time this study was written. Second, there is a fundamental difference between the era of forced isolation that we are collectively living through now and quarantines that have occurred in the past, and that difference is the overwhelming presence of technology (Guitton, 2020). The use of online technologies has become the preferred method through which governments and supranational organisations like the World Health Organization can communicate their messages and suggestions to the public. Online technologies are becoming the primary instrument in the attempt to deal with the economic repercussions of the crisis. This includes everything from online buying and teleworking to learning at a distance. Moreover, technology is rapidly becoming an indispensable component in the operation of dynamic social relationships. As a result, the COVID-19 pandemic issue has increased the significance of digital disparities, which are a sort of social inequality that is not readily apparent. Indeed, differences exist between individuals and social groups not only in terms of their access to technologies but also in terms of their capacity to obtain benefices from the use of technologies (Buchi; Festic; Latzer, 2018; DiMaggio & Hargittai, 2001; Hargittai, 2010). These differences can be attributed to both differences in access to technologies and differences in capacity to obtain benefices from the use of technologies. Digital inequalities can be conceptualised as emerging from differences in actual access to technology as well as differences in digital literacy. Digital literacy refers to the degree to which individuals have the capacity, knowledge, motivation, and competence to access, process, engage, and understand the information needed to obtain benefits from the use of digital technologies such as computers, the internet, mobile devices, and applications. Although multiple

definitions coexist, digital inequalities can be conceptualised as emerging from these differences. The social, economic, cultural, and global environments each play a role in shaping these disparities in access and digital literacy. Those who are already socially and economically disadvantaged are at an increased risk of contracting the virus as well as the myriad socioeconomic effects of the pandemic because of digital inequality. Yet, despite the significant effect that digital inequalities are having on the progression of the disease, the issue of digital inequality is not receiving nearly enough attention from decision makers at this time.

## REVIEW OF RELATED LITERATURE

Dr. Vikas Kumar, Professor of Marketing at the Indian Institute of Management (IIM) Kozhikode, has published several articles on the impact of digital inequalities on marginalized groups during the COVID-19 pandemic. In one of his recent articles titled "COVID-19 and digital divide: Analyzing the impact of technology on marginalized groups," he highlights the disparities in digital access and use and their consequences on the health and socio-economic well-being of disadvantaged communities. He proposes strategies to bridge the digital divide and promote digital inclusivity.

Dr. Ritu Paliwal, Assistant Professor at the School of Humanities and Social Sciences, IIT Indore, has written extensively on the impact of the COVID-19 pandemic on digital inequalities in India. In her article "The COVID-19 pandemic and digital inequalities: An analysis of the Indian context," she examines the challenges faced by different sections of society, such as rural communities, women, and the elderly, in accessing digital resources and participating in the digital economy. She suggests policy measures to promote digital literacy and ensure equitable access to digital technologies.

Dr. Sunita Yadav, Assistant Professor at the Department of Community Medicine, Lady Hardinge Medical College, New Delhi, has conducted research on the impact of digital inequalities on health outcomes during the COVID-19 pandemic. In her article "Digital inequalities and their impact on health outcomes during COVID-19: An Indian perspective," she highlights the correlation between digital access and health outcomes, such as telemedicine consultations and access to health information. She proposes measures to enhance digital literacy and promote the use of telemedicine in underserved communities.

Dr. Pallavi Gupta, Assistant Professor at the Department of Educational Technology, IIT Bombay, has researched the impact of the COVID-19 pandemic on the education sector in India. In her article "Addressing digital inequalities during COVID-19: A study of the Indian education sector," she examines the challenges faced by students and teachers in accessing digital resources and conducting online learning. She proposes strategies to bridge the digital divide and ensure that online learning is inclusive and accessible to all.

Dr. Arpan Kumar Kar, Assistant Professor at the School of Management, IIT Bhubaneswar, has written on the impact of the digital divide on the Indian economy during the COVID-19 pandemic. In his article "The impact of digital divide on the Indian economy during COVID-19," he examines the consequences of limited digital access and literacy on business operations and consumer behavior. He suggests measures to enhance digital infrastructure and promote digital inclusivity to boost the country's economic recovery.

Dr. Amit Sharma, Assistant Professor at the Department of Information Systems and Analytics, IIM Indore, has published research on the impact of digital inequalities on remote work during the COVID-19 pandemic. In his article "Digital inequalities and the challenges of remote work during COVID-19," he examines the disparities in digital access and skills that hinder remote work productivity and job satisfaction. He suggests measures to promote digital literacy and enhance access to remote work tools.

**Sharma, A. (2020).** Inequalities in digital access amidst COVID-19 pandemic: review of early evidence. *Journal of the Indian Medical Association*, 118(10), 30-33.

This article examines the impact of the COVID-19 pandemic on digital inequalities in India and reviews the early evidence on the inequalities in digital access that have emerged as a result of the pandemic. The article discusses the need for policy interventions to address the digital divide and mitigate the impact of the pandemic on vulnerable groups.

**Singh, R., Adhikary, P., & Banerjee, D. (2020).** COVID-19 and digital divide in India: challenges and opportunities. *Journal of Public Affairs*, 2463.

This article analyzes the impact of the COVID-19 pandemic on the digital divide in India and discusses the challenges and opportunities for addressing the divide. The article suggests that the pandemic has highlighted the urgent need for policy interventions to ensure digital inclusion and calls for the development of innovative solutions to bridge the digital divide.

**Bhatnagar, S., & Raghavendra, P. (2020).** Technology-enabled delivery of health services in India: opportunities and challenges. *Journal of Family Medicine and Primary Care*, 9(4), 1874-1879.

This article explores the opportunities and challenges of using technology to deliver healthcare services in India. The article discusses the potential of technology to bridge the gap in access to healthcare services and improve health outcomes for marginalized communities, while also highlighting the challenges of ensuring equitable access to digital health services.

**Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020).** Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*, 51, 102083.

This study examines the knowledge, attitudes, and perceptions of mental healthcare needs among the Indian population during the COVID-19 pandemic. The study highlights the need for digital mental health services to address the mental health impact of the pandemic and the importance of ensuring equitable access to these services.

**Sharma, S., & Sahu, D. (2021).** COVID-19 pandemic and its impact on digital education in India. *International Journal of Information Management*, 56, 102186.

This article explores the impact of the COVID-19 pandemic on digital education in India and the challenges of ensuring equitable access to online learning resources. The article discusses the need for policy interventions to address the digital divide and improve access to digital education for all students, particularly those from marginalized communities.

### **INEQUALITIES IN DIGITAL ACCESS AS A POSSIBLE FACTOR IN HEALTH**

There are many different ways that digital disparities might be hypothesised. Although the subject of access to technological equipment and Internet connection is extremely important, it is important to note that these are not the two sides of a dichotomous digital divide in which some people would have and some people would not have (DiMaggio & Hargittai, 2001). According to Hargittai (2003), there are four proximal elements that have an impact on the degree of capability to use technology efficiently and effectively: 1) the availability of technical means (including the quality of the hardware and software that can be accessed, as well as the strength and dependability of an Internet connection); 2) the autonomy of use (including the location where technology can be accessed, as well as the perceived freedom to use it as desired); 3) the presence of social support networks (including assistance from other users with experience); and 4) the accumulation of experience (time dimension enabling people to be familiar enough with the technology for retaining benefits from its use).

The use of technology, which is influenced by both physical access and digital literacy, is a factor that determines health and has multiple effects on a person's mental, physical, and social well-being. Inequalities in the use of digital technology have ramifications for the capabilities that individuals can muster to protect their health and well-being (Baum, Newman & Biedzycki, 2014; Golder, Newman, Biedzycki & Baum, 2010; McAuley, 2014). Inequalities in the use of digital technology are a form of social inequality that is strongly ingrained in the setting of the socioeconomic system (Robinson et al., 2015). In point of fact, digital inequality is not merely a reflection of the dichotomous divide that is sometimes represented as existing between digital immigrants and digital natives. Not only do they affect people in their later years, but also people who are socially and economically disadvantaged (Robinson et al., 2015; Yates, Kirby, & Lockley, 2015). Rather, digital inequalities exist alongside a multi-dimensional continuum, reflecting already existing social inequalities in areas such as socioeconomic status (Hargittai, 2010; Yates et al., 2015; Haight, Quan-Haase, & Corbett, 2014), age (Hall, Bernhardt, Dodd, & Vollrath, 2015; Yates et al.,



2015), level of education (Cruz-Jes (Bailey et al., 2015; Baum, Newman, & Biedrzycki, 2014).

In many nations, residents and other society entities are increasingly using digital technology as a primary mode of communication, contact, and involvement. This trend can be attributed to the proliferation of digital technologies (Baum et al., 2014). In general, having limited access to digital technologies means having limited access to other services, resources, and information – as well as the potential benefits of those things – as well as having an altered pattern of access to the other factors that determine health (Golder, Newman, Biedrzycki, & Baum, 2010). In point of fact, digital literacy is frequently required in order to gain access to the services, assistance, and information made available by governments, corporations, or educational institutions of a higher level (Hardill & O'Sullivan, 2018; Cruz-Jesus et al., 2016). The use of digital technologies is becoming increasingly essential for establishing and sustaining social connections. For example, Mesch, Mano, and Tsamir (2012) found a correlation between the use of communication applications and an increase in social capital as well as a decrease in social isolation (Cho, 2015). In addition to this, it is necessary to comprehend digital disparities within both a macrosocial and a technosocial framework. Indeed, public decisions regarding network covering politics (DiMaggio & Hargittai, 2001; Warf, 2011) and macroeconomic constraints are responsible for the fact that some countries have a lower Internet penetration rate than others (Poushter, 2016), as well as disparities within different regions of the same country (Cruz-Jesus et al., 2016; Haight et al., 2014). Inequalities in access to and use of a particular device (for example, a smartphone) are more affected by a person's age and socioeconomic level than by the sort of technology that is utilised, which can also play a role in the process of creating inequalities (Bert, Giacometti, Gualano; Siliquini, 2014; Ernsting et al., 2017). Digital exclusion, a relatively new type of social exclusion, is one factor that contributes to the worsening of both material and social deprivation. Being digitally excluded has repercussions on health factors such as education, employment, and social networks. These repercussions, in turn, contribute to the maintenance of limited access to and usage of technologies, a phenomenon known as the "digital vicious cycle" (Baum et al., 2014). Consequently, upstream factors influence individual access to technologies as well as abilities with such technologies, and as a consequence, contribute to the rise of digital disparities and the harmful effects these gaps have on health.

### **HOW COVID-19 POTENTIATES DIGITAL INEQUALITY**

The COVID-19 epidemic has prompted large, instantaneous, and unprecedented changes in the population's use of digital technologies and media. This is important to note from a technological standpoint (Guitton, 2020). Access to and use of the internet was not necessarily a priority – or even a possibility – for everyone prior to COVID-19, as some people were able to function normally in most aspects of social life without it. This could be due to the assistance of another person, or it could be simply because their social context did not require it. Regardless of the reason, access to and use of the internet was not a necessity for everyone (Lupac, 2018). The position of virtual digital places, however, has shifted from that of an amenity to that of a need as a result of what can only be described as a worldwide lockdown that severs the interpersonal links that are so important to the maintenance of our core social structures. In the context of the COVID-19-related quarantines, there are very few options available besides the utilisation of technologies to handle even the most routine of responsibilities. Because of the strain that COVID-19 places on the structures themselves on the one hand, and the greater reliance on technology on the other, existing digital disparities are likely to become even more pronounced as a result of the four considerations that were stated earlier in this paragraph.

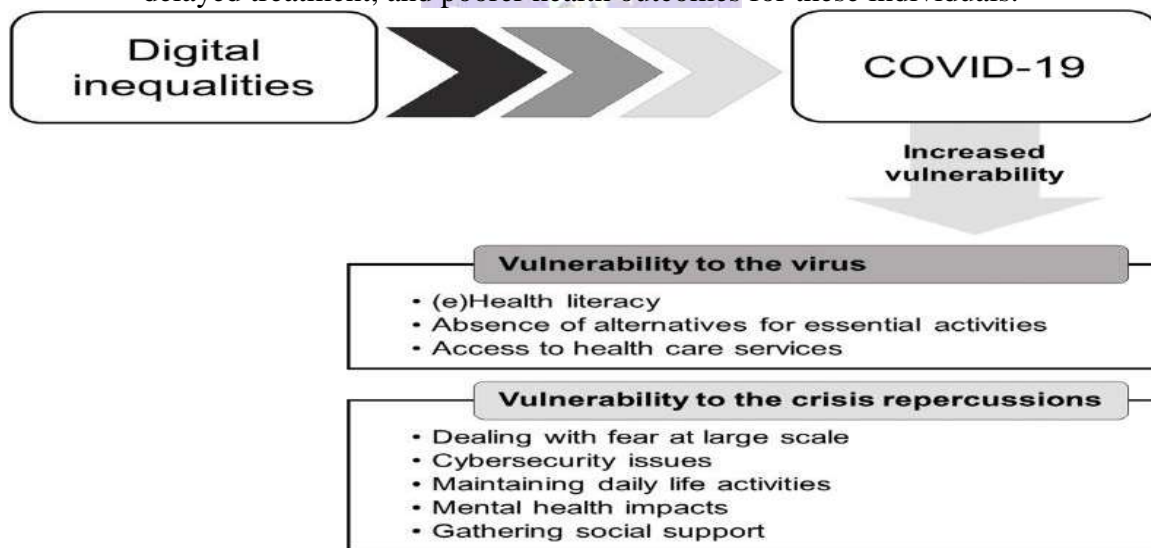
The convenience of accessing technologies (like computers and the Internet, for example) is different for people who can do so from their own homes and for people who must do so from public places like schools, libraries, or Wi-Fi hotspots in coffee shops. Those who can do so from their own homes have an advantage in this regard. Disparities in the autonomy of usage are particularly troubling in the context of COVID-19 due to the fact that state authorities are closing a large number of centres throughout the country that people may use

to access the internet. Those who were able to use the internet while they were at work are no longer in a position to do so because many businesses have shut down. More importantly, a surge in unemployment is one of the direct economic repercussions of the crisis (Fernandes, 2020). This makes it unlikely that people with little means would be able to keep a home connection to Internet provider services. In addition, those who have a restricted digital skill set will have a more difficult time obtaining alternative employment in the aftermath of the pandemic. In addition to problems that arise from a lack of physical access to the internet, the COVID-19-induced confinement will also result in changes to one's feeling of freedom when it comes to the usage of technological devices. In point of fact, the use of the Internet at home is becoming increasingly constrained due to the presence of other members of the household, such as the children, or by the imperatives of telework, which increases the difficulties associated with carrying out desired online activities.

### **ROLE THAT DIGITAL INEQUALITIES IN THE PROMOTION OF COVID-19 VULNERABILITY**

The relationship between COVID-19 and digital inequalities is complex and multifaceted, with digital inequities exacerbating the vulnerability of certain populations to the pandemic. The COVID-19 pandemic has highlighted the critical role of digital technologies in ensuring access to essential services, such as healthcare, education, and employment opportunities.

However, the unequal distribution of digital resources has created significant barriers for many individuals and communities, particularly those that are marginalized and vulnerable, in accessing these services. Digital inequities have potentiated vulnerability to COVID-19 in several ways. One of the most significant impacts of digital inequities is limited access to healthcare. The lack of access to digital technologies, including internet connectivity and digital literacy, can hinder individuals' ability to access essential healthcare services, such as telemedicine consultations and online health information. This can lead to delayed diagnosis, delayed treatment, and poorer health outcomes for these individuals.



**Fig. 1 Impacts of digital inequalities on COVID-19 Vulnerability**

Furthermore, digital inequities can also limit individuals' ability to participate in public health measures to prevent the spread of COVID-19. Individuals who lack digital access are more likely to work in essential services and may not have the option to work remotely. This puts them at a higher risk of exposure to COVID-19, and also limits their ability to participate in remote learning or other virtual activities, which can exacerbate existing educational and economic disparities. In addition, digital inequities can also lead to social isolation and exclusion, which can have significant mental health impacts. The lack of access to digital technologies can hinder individuals' ability to connect with family and friends and access social support networks, which can exacerbate the negative mental health impacts of the pandemic.

In conclusion, the reciprocal impacts of COVID-19 and digital inequalities are complex, with digital inequities exacerbating the vulnerability of certain populations to the pandemic. It is

essential to address these inequalities by providing access to digital technologies and promoting digital literacy, especially for marginalized and vulnerable populations, to ensure that all individuals can participate fully in the digital society and access the critical resources needed to prevent and treat COVID-19.

### ***Vulnerability to the virus itself***

When it comes to an individual's capacity to take preventative measures, the question of whether or not they can access, comprehend, and act upon suggestions regarding material found online is central. Since the beginning of the COVID-19 crisis, the primary tool that the government and official agencies, such as the World Health Organization, have used to disseminate information about the precautions that individuals need to take in order to avoid becoming contaminated themselves and contaminating others is the use of digital spaces. Nevertheless, if digital media are the primary means of communication, some of the most vulnerable socioeconomic groups, such as the elderly, the homeless, recent immigrants, or residents of rural areas, are the ones who are the most difficult to reach (Lee, Rogers, & Braunack-Mayer, 2008). In this setting, existing discrepancies in digital literacy and health literacy are compounded, which has the effect of making existing inequities more severe. eHealth literacy is defined as people's literacy, knowledge, motivation, and competence to access, understand, and appraise health information from electronic sources and to apply it to make decisions in everyday life to address healthcare, disease prevention, and health promotion to maintain or improve quality of life (Norman & Skinner, 2006; Srensen et al., 2012). These two factors cause differences in eHealth literacy, which is defined as people's ability to access, understand, and appraise health information from electronic sources. Individuals who have lower levels of eHealth literacy have a more difficult time accessing, comprehending, and using preventative measures, which makes them more susceptible to COVID-19 contamination or spread. This makes them more likely to become infected. Processing and implementing information that is relevant to health is made more difficult as a result of the context of COVID-19, which brings up supplementary factors. In point of fact, making a decision always involves the incorporation of abstract concepts that have a direct bearing on one's day-to-day existence. This is because one is required to consider the possibilities and outcomes associated with the adoption of previously routine behaviours.

### ***Exposure to the potentially devastating effects of the crisis***

Pandemics have the potential to create significant devastation, not just in terms of the lives lost but also in terms of the economic fallout. In today's highly linked world, epidemics can also generate large reactions from the general populace. In this day and age of "fake news" and distrust towards official messages, these responses, powered by social media and nurtured by misleading representations of popular culture, can spark widespread panic that can be extremely harmful – in fact, it has the potential to be significantly worse than the outbreak itself. In the process of disseminating information, governments and public health agencies need to strike a balance between adequate sensitization and unwarranted fear. The proliferation of false news and other material originating from unreliable sources that may be in conflict with the advice given by governments and organisations concerned with public health is facilitated significantly by the Internet. People who are unable to determine the degree of veracity of the information (typically as a result of a low level of critical digital or health literacy) may follow various pieces of advice pertaining to COVID-19, which may not only be harmful for their own health but also be harmful for the health of the population as a whole.

In the context of COVID-19, the increasing importance of digital inequalities as one of the primary determinants of well-being draws attention to the fact that digital spaces are becoming essential to the maintenance of daily life activities such as education, work, service provision, or entertainment. Concerns relating to cybersecurity can also be raised in the context of COVID-19. In point of fact, people are more susceptible to being victims of cybercrime as the amount of time they spend online and their reliance on technical tools continues to grow (Guittou, 2019). It should be noted that several fraudulent frauds that prey



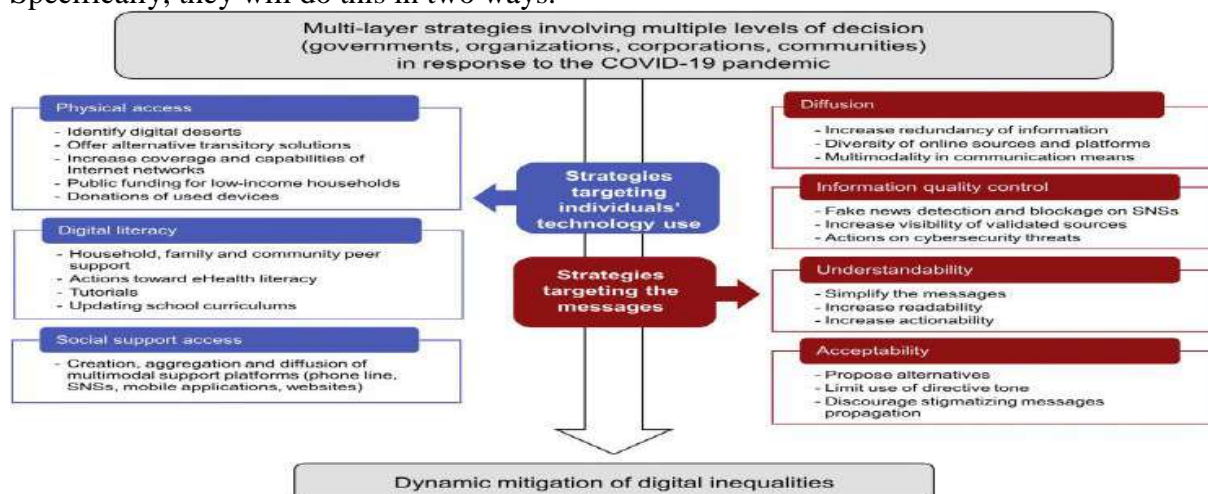
on people's fears and their lack of knowledge about eHealth have already been recorded (Saltzman, 2020; World Health Organization, 2020).

Virtual spaces offer a means of communication that can be used to maintain social bonds between family members, friends, coworkers or community members and strengthen durable social bonds in light of the primary strategy that governments around the world have adopted to combat the COVID-19 pandemic, which is to impose various degrees of social distancing measures (Sunderland, Beekhuyzen, Kendall, & Wolski, 2013). It is essential to maintain social relationships through the use of virtual spaces in order to receive the required social support in order to cope with the unpredictability, worries, and anxiety that come along with the repercussions of the pandemic (Brooks et al., 2020; Qiu et al., 2020). In addition, the significance of online communities such as discussion forums and online groups, which can be utilised for social support as well as information gathering, is expected to grow in the coming years (of note, Reddit, one of the major online forum platform, is already supporting at least three community rooms about COVID-19). Those who are able to efficiently navigate digital environments will have a significant advantage over their competitors if they are able to resort to virtual communities when social isolation is imposed on them.

Traditional grieving rituals provided by funeral homes are being disrupted as a result of the pandemic. This is the case regardless of whether a deceased loved one passed away as a result of the COVID-19 virus or some other cause. The stress of not being there for the final moments of a loved one and the lack of funeral rites could have many consequences on mental health and the grieving process. These impacts have yet to be qualified but are likely to have a negative effect. Even though digital technology may offer ways to mitigate these effects, such as online memorials and virtual funerals (Arnold, Gibbs, Kohn, Meese, & Nansen, 2018) and online peer support groups (Robinson and Pond, 2019), the benefits that people can retain from these tools vary depending on their levels of digital skills. For example, online memorials and virtual funerals can be created by people who have low levels of digital skills. For example, those who have never used the online memorials features found on grief-specific and general websites (like the memorialization option on Facebook), may find that utilising these services is difficult because of a lack of prior knowledge. In a similar vein, a sluggish Internet connection can restrict one's ability to attend virtual funerals.

### STRATEGIES FOR MINIMISING THE IMPACT

It is necessary to put into practise mitigation techniques in view of the obstacles and complexities posed by digital inequalities for the resistance of the people to COVID-19. These measures will try to mitigate both the implications of the COVID-19 crisis on digital disparities as well as the impacts of digital inequalities on COVID-19 vulnerability. Specifically, they will do this in two ways.



**Fig. 2 Mitigation strategies to limit the impacts of digital Inequalities during the COVID-19 crisis.**

These strategies will invariably consist of many tiers and will be required to take into account a number of different decision-making levels, including governmental, organisational,

community, and individual levels, in collaboration with research and higher education institutions. In the specific setting of the COVID-19 pandemic, every strategy should keep an overall goal of actionability and equity in mind. According to a Saussurean concept of human communication (de Saussure, 1916), all strategies should ultimately be directed towards people. Yet, while some strategies are directly addressing individuals' access to and use of technologies, other strategies are focusing on the message itself (Fig. 2 ).

### **Strategies targeting Individuals' Technology use**

**Digital Literacy:** Providing digital literacy training to individuals can help them acquire the skills needed to navigate the digital landscape and access essential services, such as remote education and telehealth.

**Access to Devices:** Ensuring access to affordable and reliable digital devices can enable individuals to participate in the digital society and access basic services.

**Internet Connectivity:** Ensuring affordable and reliable internet connectivity is critical to bridge the digital divide and enable individuals to access digital services, especially for those living in rural and remote areas.

**Digital Skills Development:** Promoting digital skills development can help individuals acquire the technical and social skills necessary to navigate digital platforms and utilize digital services effectively.

**Tailored Digital Solutions:** Developing digital solutions that are tailored to the specific needs of marginalized and vulnerable groups can help address their unique challenges and improve their access to digital resources and services.

### **CONCLUSION**

To sum up, the COVID-19 pandemic has had a profound impact on digital inequalities worldwide, exacerbating pre-existing disparities and creating new forms of divide. This has had far-reaching consequences for marginalized and vulnerable groups, hindering their access to basic services and their ability to participate in the response to the crisis. The situation calls for urgent and multi-pronged action, including policy interventions, community-based initiatives, and technological innovations, to bridge the digital divide and mitigate its impacts. By addressing these issues and ensuring equitable access to digital resources and skills, we can create a more inclusive and resilient society that is better equipped to tackle future crises. It is therefore imperative that all stakeholders work together towards this common goal, to build a digital society that is truly inclusive and equitable.

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