Telehealth: A Viable Option for Optimizing Health System Performance during COVID-19: Call to Action for Future Pandemics

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Abstract: Delve into the 21st century to welcome telehealth! It has taken so long coming, only to be accelerated by the COVID -19 pandemic. With the advent of telehealth solutions, healthcare systems are on the edge of the biggest gush in activity in over a century. In this paper, we look for evidence in the literature that treats the disruption introduced by Telehealth diffusion and the resulting, long awaited, contribution to optimizing health system performance. In our paper, we attempt to use the scoping review to detect evidence to answer this question. We performed a search up to April of 2021. Data were extracted on general study characteristics, clinical domain, technology, setting, category of outcome, and results. We then concluded with a synthesis of the information and call to action. We then coded the findings through the lens of the quadruple aim, provided reflections from the scoping review to inform how telehealth can be a dynamic element of system resilience. Though faced with unintended consequences, telehealth promises to be a viable alternative to in-person care, optimizing health system performance especially in times of constrained resources during a pandemic.

1 INTRODUCTION

As the pressing need to expand the delivery of healthcare has surpassed the traditional limits of implementation, the substantial burden of the COVID-19 pandemic has placed the provision of healthcare services under duress. Embracing telehealth paves the way for all those vigilant in the work of improving and transforming health care systems, to usher in the new era of delivering healthcare services through a reconfiguration of technology to improve healthcare.

A US study conducted before the COVID-19 Pandemic, shows that the use of telemedicine was in the most part, to address issues of accessibility and reach of care to underserved areas (Barnett, 2018).

By January 2020, as COVID-19 was becoming ostensible, the demand for telehealth services spiked a 2000% increase in visits before the end of April 2020, and in-person visits declined 80% (Kaplan, 2020). In response to the pandemic, some research has reported the surge in the use of telehealth services as an option for clinic appointments, in some cases, 83% of the surveyed, cited the COVID-19 pandemic as the impetus for implementation of such services (Parisien et al, 2020).

Quick telehealth expansion is an astounding example of what can happen in a matter of weeks that was reputed to take a decade. As we explore the outcomes associated with the implementation of telehealth technology in healthcare ecosystems, we are mindful of the challenge in bridging the gap between the potential for extending healthcare technology to overcome the disruption in the provision of health services and the potential impact on the quality of healthcare services and health ecosystem performance.

This phenomenon was a worldwide event as countries moved towards a hurried adoption of telehealth-based practice to reduce the risk of the pandemic spread. Health systems have added billing codes on their schedules that differentiate Telemedicine based care. Even prehospital telecare became common, more in Europe than the US (Winburn et al, 2018). The uptake of telehealth implementations has been reported in Urgent and Non

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Urgent Care (Parisien et al, 2020), clinical consultations (Smith et al, 2020), for children and adult care (Tan, 2020) and has accelerated with the increased restrictions. Even developing countries reported an increase in video consultations as a primary means of care (Helou et al, 2020). This is an indication that Telehealth use came as an urgent, temporary, alternative care to face – face consultations, fuelling the reconfiguration of the care ecosystem (Badr et al, 2021). Technology implementers have joined the front line of the medical provider workforce to deploy and maintain the platforms that make these "at a distance" services possible. A new level of interaction between the care team and a new set of sociotechnical complexity arise.

Have some implementations of telehealth solutions disrupted the quality of care or were they a long awaited contribution to optimizing health system performance? In our paper, we attempt to use the scoping review to detect evidence to answer this question.

2 BACKGROUND

2.1 Telehealth: Care at a Distance

Efficiency of healthcare service, effectiveness in resource usage, and patients' satisfaction occupy central attention in the discourse around care at distance. These sustainability principles are essential to the optimization of the services that would otherwise be traditionally with one building and controlled setting. With telehealth technologies, it has become possible to extend these principles to distance care solution such as care at home for instance (Polese et al., 2018). Hence, telehealth is the delivery of healthcare services by healthcare professionals using information and communication technologies, for the exchange of valid information for diagnosis, treatment, and injuries and prevention of disease, evaluation and research, and the healthcare providers' continuing education (Fisk et al., 2020).

The modes of delivery of telehealth incorporate technologies such as videoconferencing, mobile applications, and secure messaging. Furthermore, telehealth services include provider-to-provider services with patient presence, provider to provider without patient presence, tele monitoring, and health education etc. (Tuckson et al., 2017). In our paper, we

refer to telehealth as the overarching term to signify the service of providing care, which the central notion of our work.

2.2 Optimizing Health System Performance

The pandemic has accentuated the focus on distant care, pushing the limits on telehealth deployments for safety concerns and for the optimization of the resources in the healthcare systems. The facilitation of telemedicine services has made care possible and accessible. Though in some cases disruptive to the existing traditional processes and care delivery models, this new way of mainstream care may continue to contribute to optimizing the provision of care. Indeed, practitioners and academics have advocated leveraging health information technology to achieve the "triple aim" of healthcare reform (Bisognano and Kenney, 2012; Sheikh, 2015).

Improving care quality while containing costs of care are the central arguments for the Triple Aim framework developed by the Institute for Healthcare Improvement (IHI)[1] for optimizing health system performance. The framework directs health systems to pursue three dimensions, simultaneously for Improving the patient experience of care (including quality and satisfaction); Improving the health of populations; and Reducing the per capita cost of health care. Extending this recommendation, the Quadruple Aim adds the dimension of improving the work life of health care providers, including clinicians and staff (Bodenheimer and Sinsky, 2014).

In our scoping review, we choose the Quadruple Aim Framework as a lens to evaluate our findings and synthesize on lessons we can glean from the current literature.

3 METHODOLOGY

We conducted a scoping review to evaluate the potential for improvement in the healthcare ecosystem performance driven by the implementation of telehealth. A scoping review, in this case, can be useful to synthesize the relevant evidence in the literature and identify opportunities for further research or calls to action (Munn et al, 2018). Our search involved online databases including Google Scholar and PubMed, exploring articles from the Journal of Telemedicine and Telecare, Journal of

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[1] http://www.ihi.org/Topics/TripleAim/Pages/Overview.aspx

American College of Surgeons, International Journal of Medical Informatics, New England Journal of Medicine, JAMA Dermatology, NEJM Catalyst Innovations in Care Delivery, JMIR Public Health Surveillance, International Journal of Environmental Research and Public Health, and JAMA Intern Med. The initial search was performed using the search filter of "Telehealth" AND "Impact on Quality of Care" in which 209 queries were retrieved.

Then, in a second step, we refocused our lens on the combined terms "Telehealth" AND "Quadruple Aim" AND "impact on quality of care" to isolate the content that would address our research question. We found limited material (6 papers) on the narrow subject. In scanning the literature, the terms telehealth and telemedicine were found to be often used interchangeably which echoed a primary concern making the evidence more problematic to evaluate. Upon review, we found that most telehealth literature refers to telehealth as the broader practice of the concept of delivering healthcare services at a distance and refers to examples from the field of practice for telemedicine as the term that describes the actual practice of medicine at a distance. Therefore, we expanded our narrow search on the combined terms "Telemedicine" AND "Quadruple Aim" AND "impact on quality of care" (six papers were also found).

Thus, our results offered little evidence in the literature to support the conversation on the potential of telemedicine for healthcare improvement guided by principles of the quadruple aim. We found sparse evidence on how Telehealth and Telemedicine use would influence the ability of a healthcare ecosystem to fulfil the quadruple aim. We therefore proceeded with the initial 209 articles in an attempt to be most encompassing to yield the subset of articles for our coding, hoping to develop hidden information in the direction of our research question. After the screening, the relevant articles were identified, only those that were written in the English language were chosen. Duplicate publications in different journals were removed and student dissertation excluded. Articles were read in full to confirm eligibility. The review was narrowed to 50 articles. After carefully inspecting the identified articles, we further refined our synthesis to extract evidence of improvement in the healthcare system performance. Each author reviewed findings individually, and then coded using themes from the four principles of the quadruple aim:

(1)   Improving the patient experience of care,

(2)   Improving the work life of healthcare providers,

(3)   Reducing the per capita cost of health care;

And

(4)   Improving the health of populations.

The coding revealed secondary codes that we categorized under the main codes, adding depth to our findings.

4   FINDINGS AND DISCUSSION

Despite the existence of some literature on Telehealth and Telemedicine to impact on quality of care, few papers trace the connection between these same technologies and the context of Quadruple AIM.

The dialogue in the context of telemedicine and the impact on quality in the context of the goals of the quadruple aim has been limited to very few inferences. One paper addressed how telemedicine and smartphones are enabling more flexible and mobile work (Nakagawa and Yellowlees, 2019) with emphasis on continuity of care at home (Helmer-Smith, et al, 2020). In other examples, healthcare technology in general has shown evidence of impact on healthcare quality (Buntin, 2011; Fiani, 2020). Innovative health technologies such as telehealth can possibly help improve training, patient centeredness, access, agreeableness, decency, efficiency, quality, outcomes, and cost viability (Fund, 2017; Lopo, 2020). Therefore, we found sparse evidence on how Telehealth and Telemedicine use would influence the ability of a healthcare ecosystem to fulfill the quadruple aim; this paper puts the focus on this context, as our scoping review isolated the concepts of the quadruple Aim in the context of Telehealth adoption (Figure 1).

We have identified some works that demonstrate telehealth as a technology to improve the patient experience through timeliness of care (Caffery et al, 2016; Gattu et al, 2016; Lum et al, 2020); and better access (Qureshi et al, 2015; Lurie and Carr, 2018; Lavin et al, 2020); leading to an improved quality of life for care seekers (Waibel et al, 2017). Other works connected a decreased hospitalization and resource utilization to the implementation of telehealth solutions (Gattu et al, 2016), lessening the workload on the care staff (Bashir and Bastola, 2018), thus improving the work life of health care providers (Lopo et al, 2020). Our investigation revealed that Telehealth has the potential of reducing cost of care (Mehrotra et al, 2013; Liu et al, 2016) and improving the outcome of care (Flodgren et al, 2015; Snoswell et al, 2017).

Improving Patient Experience	Timeliness of Care
	Access to Care
	Patient Centricity
	Enhancing the Patient Journey
Improving Work Life of Health Care Providers	Decreased hospitalization / resource utilization
	Lesser workload on the staff.
	Improved satisfaction / provider experience
Reducing Per Capita Cost	Direct: lower actual cost of intervention
	Indirect: reduction of resource utilization
	Virtual care claims cost a fraction of in-person alternatives
Improving Health of Populations	Improved Mortality rate
	Improved ICU infection rate
	Better quality of life
	Improved Outcome: medication adherence

Figure 1: Telehealth & Optimizing Health System Performance – from our Scoping Review.

4.1 Improving Patient Experience of Care

Timeliness of Care: Evidence suggests that the adoption of telehealth has improved timely access to care, especially for low acuity conditions or serious, time-sensitive situations; hospitals are adopting telehealth to improve operational efficiencies and provide timelier access to specialty care (Lum et al, 2020).

Our review has identified a case, with a significant (75%) reduction in patient wait times for urgent care conditions, through a telehealth triage program (Caffery et al, 2016). In another case, while chronic pain clinic patients waited for an in person consultation, they have received useful advice in 86% of cases, through their telehealth portals, reducing the negative impact of the long wait times on their day to day lives. Using virtual visits for low-acuity patients, reduced the emergency departments wait from 2.5 hours to 40 minutes (Caffery et al, 2016) and timely diagnosis of minor illnesses in children and adolescents has improved school attendance (Gattu et al, 2016).

Access to Care: Our scoping review has identified instances of improved access to care with telehealth services, while also recognizing access barriers of technology reach in some rural populations of Central Asia (Qureshi et al, 2015) and Africa (Lurie and Carr, 2018). By placing the technologies directly in patients' homes or at local clinics near them (Lavin et al, 2020), patients have reported an improved quality of life, ameliorating their experience and almost half strongly disagreed whether they still must see the provider in person and most (86%) of them strongly agreed on the use of telehealth again (Waibel et al, 2017).

Patient Centricity: Consumers are willing to use telehealth for everything from prescription renewals to chronic disease management and behavioural health (Lum et al, 2020). Patients seeking virtual care rated their satisfaction as "very good" to "excellent" (Thomas et al, 2020). To note, patients feel in charge if their records and the levels of care they receive as their contribution and input through online available systems, with complete histories, and physical examinations, contribute to the outcome of correct diagnoses in 76.5% of the visits (Schoenfeld et al, 2016). Still, one study identified that lab tests may have been unnecessarily ordered due to a conservative approach of ordering antibiotics (Mehrotra et al, 2013).

Enhancing the Patient Journey: Telehealth implementations have brought the information to the patients, whereby a decrease in emergency department's visits (Wosik et al, 2020), especially in pediatric visits (DeJong et al, 2014). Patients are finding their answers with Telemedicine tools and more digital means of interaction with the care providers. Case studies have reported a two-fold improvement in the completeness of documentation and increase in appropriate antibiotic prescribing within six months due to the use of telehealth services (DeJong et al, 2014). This implies a lesser workload on the care staff and reduction of fatigue. Other cases have noted a reduction in hospitalizations, length of stay, and 30-day readmission rate (DeJong et al, 2014), especially among the home based telehealth patient population (Lum et al, 2020). Video visits combined with remote patient monitoring enable healthcare organizations to better monitor patients, relieve workload and reduce consumption of care resources.

4.2 Improving Work Life of Health Care Providers

Decreased Hospitalization / Resource Utilization: Hospitals are adopting telehealth to improve operational efficiencies and provide timelier access to specialty care (Lum et al, 2020). For example, timely diagnosis, with the use of telehealth for minor illnesses in children and adolescents decreased emergency department utilization by 22% (Gattu et al, 2016). This reduction reflects on lesser workload on the staff.

Improved Satisfaction / Provider Experience: Telehealth has improved the quality of the nursing practice and reflected on the quality of the care services (Bashir and Bastola, 2018). With the implementation of telehealth in the model of care,

satisfaction levels at the provider experience have improved (Caffery et al, 2016). Studies in our scoping review reflected on healthcare practitioner's morale affecting workforce engagement and safety such as workforce burn-out (Sikka et al, 2015). The literature review has noted provider experience satisfaction in 94% of cases of telehealth implementations (Lopo et al, 2020).

4.3 Reducing per Capita Cost of Health Care

Our investigation revealed that Telehealth has the potential of reducing cost of care. Telehealth programs can be cost saving for intermediate and high-risk patients over a 1- to 5-year window (Liu et al, 2016). The cost reduction can be direct through actual cost of intervention or consultation and also indirect through reduction in the consumption of hospital services (Mehrotra et al, 2013). Service cost a weighted average of $47.35/case, compared with $133.60/case for traditional refer (Caffery et al, 2016). In one case, the service cost has decreased to third for traditional referrals (Caffery et al, 2016) and virtual care claims have saved the health plan an average of 30% per claim (Lum et al, 2020).

4.4 Improving Health of Populations

Telehealth consultations contribute to the adherence to clinical management guideline (Steinman et al, 2015), and the satisfaction of both patients and providers (Waibel et al, 2019) and showed no significant difference in adherence to treatment guidelines across the multiple care modalities (primary care, urgent care, etc.) of which telemedicine has become one. There has been some pleasing news on the decrease in mortality rates in ICUs (DeJong et al, 2014) and especially concerning the reduction of risks (30%) of sepsis (Steinman et al, 2015). Telemedicine intervention decreased overall mortality and length of stay within progressive care units without substantial cost incurrences (Armaignac et al, 2018). Additionally, we found evidence of improved quality of life where participants with diabetes had a lower glycated hemoglobin (HbA1c %) levels, a decrease in LDL, and blood pressure (Flodgren et al, 2015). DeJong et al 2014 elaborated that uniform transparency about care and referral protocols would be helpful. Creating a consumer-dominated regulator, which could compile information on e-visit websites' performance, may improve outcomes. Telehealth tools can aid in improving medication adherence, thus contributing to

improved patient outcomes, decreased likelihood for hospital admissions, reduced healthcare cost burden, and improved mortality in heart failure patients, a study finds (Broadway, 2021). An interesting article in our review, noted that by understanding societal values such as patient preference and willingness-to-pay, we might be able to quantify the value of new interventions and extra-clinical outcomes associated with telehealth more effectively (Snoswell et al, 2017).

5 REFLECTION FROM THE SCOPING REVIEW

Telehealth implementations are starting to prove some contributions for optimizing health system performance, as evidenced by our scoping review. The literature provides a favourable view on the potential for Telehealth to improve the patient experience of care through increasing access to timely care, focusing more on the needs of care for each patient. With Telehealth there is a great opportunity to decrease hospitalization and optimize health resource utilization. This will also drive an improvement in the quality of life of the practitioners, lower the cost of care, improve medication adherence, etc. leading to improved health of the population. As a viable alternative to in-person care, Telehealth is now a dynamic element of care system resilience. The scoping review has inspired a few calls to action to reign in and understand the risks incurred while providing care virtually and how an interruption in the virtual service may affect the outcome. The complex care ecosystem with all its actors and stakeholders must be prepared and the access to latent information must be ushered to curb likely misuse. The literature does not reflect on how privacy was ensured in such visits and what happened when a breach in privacy and confidentiality took place and how this affected the satisfaction (Badr et al, 2021, January). The COVID-19 pandemic coupled with the rapid explosion of telehealth services grants an unparalleled opportunity to examine related ethical, legal, privacy and confidentiality, information technology infrastructure and social challenges during a time of crisis in healthcare. Just like the current and potential benefits, conversely telehealth has limitations which are essential to address into the mainstream of telehealth deployment.

5.1 Unintended Consequences of Benefits

Innumerable technologies can be applied through telehealth to empower patients to have control over their healthcare, but despite current research, rigorous investigation needs to be completed to determine all the possibilities where technology could be beneficial and useful (fit for use), and also under which circumstances (fit for purpose). A full understanding is needed in order to curb the risk of some unintended consequences.

Fit for Use: Although, one of the benefits of telehealth implementation is reducing the cost through providing access to rural areas, reducing emergency department utilization, and avoiding hospitalizations; implementing telehealth may not be cost-effective in the short term due to high infrastructure and operational cost and capability building required for the mainstream of practitioners to use the new technologies. Our review highlighted the importance of removing financial barriers to use telemedicine, implementing waivers to purchase essential devices and internet access, and offering education and training, could be options in that direction.

Fit for Purpose: For instance, attention must be given to avoid risks of unintended consequences. Examples of such risks are identified in cases of patient interaction and practitioner satisfaction in administering care. Studies have persistently shown that telehealth implementation can improve patient outcomes due to a timely patient-provider interaction. Telehealth can encourage more personal encounters and assist healthcare providers by increasing their ability to develop improved relationships with patients, which may lead to better patient compliance and thus enhance patient outcomes. However, in the absence of tactile examination, physicians may perceive the absence of the physical contact with the patient as inadequate evaluation, incomplete diagnosis or inappropriate treatment. Thus, a dual need for evidence-based provision of care along with easy contextual upskill may be strategically addressed through a complementary approach between physical and virtual care. Results of another study showed that 42.9% of doctors believed that telemedicine disrupts the doctor-patient relationship and causes a breach of patient privacy. Cyber related malpractice insurance would be required for telehealth practitioners to protect patients from fake providers and breaches in data security and privacy (Gogia et al, 2016).

Risks of Technology Fatigue among Practitioners: Studies in our scoping review reflected on healthcare practitioner's morale affecting workforce engagement and safety such as workforce burn-out. Telehealth has improved the quality of the nursing practice which reflected on the quality of the care services. In addition to reducing the burden of scheduling, physical and mental exhaustion of the care providers, telehealth helps lessen transportation costs for the latter, relieve time lost at work, improves access to specialists, and promotes continuity in care. This is a significant improvement to the work life of health care providers, leading to a better system performance overall. Opposing views may see that when people spend a lot of time virtually, may expose health care professionals to "zoom fatigue" which may eventually reflect on their ability to provide care – A moderation is required with the use of virtual platforms of communication.

5.2 Telehealth a Dynamic Element of System Resilience

Resilience is commonly portrayed as a positive capability that allows actors in a system to thrive in dynamic contexts, adapting, reconfiguring and developing sustainability (Pisano, 2012). A resilient healthcare system exhibits an ability to overcome the disruption in healthcare services the latest experiences provide evidence that telehealth is no more the cherry on top but has become an essential component of care delivery. Telehealth aids the healthcare system in achieving healthcare equity by closing care gaps that have been created by current care models and hence ensuring continuity of care.

After decades of measured implementation of telemedicine and telehealth (Flores et al, 2020), the COVID-19 pandemic has dramatically changed not only the frequency of patient-clinician visits conducted via technology across a distance, but also the urgency to practice at a distance, in order to prevent the spread (Turer et al, 2020). Telehealth became a component of the personal protective equipment gear, designated as Electronic PPE (ePPE), in the medical practice (Wosik et al, 2020), giving this new interaction experience a mainstream (Vilendrer et al, 2020; Li et al, 2020). Thus, bridging the digital divide for a tranche of the population, and creating new challenges for others vulnerable sectors of society (Ramsetty and Adams, 2020). Clinicians now could practice from the hospital and from home. While practitioners used teleconferencing equipment and connected remote devices to collect their patients vitals and provide a remote assessment (Badr et al,

2021), patients were able to access their information through their mobile app, interfaced with the health record. (Munn et al, 2020). Although extending healthcare engagement into the patient home was pursued out of necessity, it is evolving around easier access to care and timely patient-provider interaction.

While Telehealth can facilitate swift and successful reconfiguration of care, it also creates tensions among the complex health system that require careful consideration (Cho and Robey, 2007). A call to action is indispensable now, as we embark on this untethered diffusion of telehealth innovations.

Firstly, when evaluating the literature, we found lack of evidence in studies that shown the impact of technology interruption on the care provided. The literature did not depict whether any adverse events took place while providing care virtually and how an interruption in the virtual service affected the outcome. Providers may potentially become more frustrated and stressed out of dealing with patients who delay treatment.

Secondly, when scoping to the future, healthcare organizations shall assess the organization readiness, put the policies in places, provide education and continuous support, check financial reimbursements, consider IT breakdowns, consider laws of physician provision of services within the boundaries, and most importantly, consider privacy and confidentiality. All these factors shall be sought when determining the future of telehealth.

Thirdly, access to telemedicine software shall be escorted with simple guidelines on its proper use and what to do in case an interruption happens. A continuous evaluation and monitoring model shall be put in place to unceasingly assess the system.

Finally, decision-makers still lack adequate information on comparing the effects of telemedicine applications to alternative health care strategies. They also lack good evaluation of the infrastructure implications and financial requirements for sustaining telemedicine post COVID. Telemedicine shall be included as a part of regional disaster health care systems and provide some of the needed protections for patients and providers. Disaster planners and telehealth clinicians shall leverage technology to improve health care delivery and prevent the disruption of services during such times (Gogia et al, 2016).

5.3 Telehealth – Viable Alternative to In-person Care

The former year has brought the vital nature of virtual care to the vanguard. Mitigating the spread of the COVID -19 pandemic has linked isolated patients, provided care for non-COVID-19 patients, and led to the accelerated diffusion of telehealth services. During the COVID-19 pandemic, we have seen the perceptual cycle of ineffective/absent public healthcare processes compounded by lack of access to healthcare services. The provision of health care services through telehealth technologies has revealed a reassuring effect in the lives of patients.

The public is increasingly in need to access personalized advice with ease, which will lead to better quality of healthcare services and, particularly, improving the overall patient experience. In this era of Netflix, Uber, Amazon, Zoom, mobile banking, and a technology facility that enables a 3-year-old to log in to online classes, unaided, it will not be proper for the healthcare sector to tumble behind. An average consumer finishes nearly all aspects of their life online; healthcare shall be just as convenient, reachable, and innocuous as online banking.

Leveraging telehealth may produce a higher level of access and new ways for patients and providers to participate in the care system resulting in increased satisfaction for both patients and providers. Telemedicine while evolving and changing the current landscape of healthcare, can in a way take us back to a time when home visits were a part of normal practice; however, it is now virtually (Shockley, 2020). Immunocompromised, homebound or patients who live in remote areas, for example, could receive uninterrupted access to healthcare services. Furthermore, other patients who want to save time and cost by reducing travel may continue to seek virtual care if it is available.

Progressively, for telehealth to become a more viable alternative to in-person care, research recommends that healthcare leaders must be less reactive and more adaptive in the development and implementation of telehealth solutions (Shockley, 2020) in order to face the challenges in this complex healthcare ecosystem,. Henceforth, the authors offer a few recommendation, as calls to action, motivated by of the findings of this review

Firstly, as we look forward, virtual care will persist to build the needed foundation to provide safe and effective care with the right clinician, at the right time, and at the convenience of the patient. Remote patient care should be provisioned virtually to improve effectiveness and enhance patient outcomes. It offers instantaneous communication with the healthcare provider at the convenience of the patient (according to his or her time schedule, saving travel time for those in rural areas). With the rapid expansion of telemedicine in the light of the COVID-

19 pandemic, ensuring that remote care reaches diverse, low-income patients and promotes health equity rather than exacerbating health disparities is critical. One important aspect to take into deliberation is that telemedicine may not be accessible to specific individuals with disabilities and older adults, and hence affects the treatment delivery via telehealth technology; the odds of leveraging telemedicine will be those aged 64 or younger. As mental health problems are more prevalent in older adults, tele-mental health services are urgently needed, especially during the pandemic, for this age category.

Secondly, a deployment of a digital health strategy that includes telehealth can be effective to decrease service costs, improve satisfaction, and improve the entire experience as the hospital rooms will be extended outside of the physical facility and into patients' homes. Such strategy will move us in the direction of optimizing health system performance. Nevertheless, in the implementation of telehealth, we shall acknowledge the perilous role of the workforce in the healthcare revolution (Fiks et al., 2021). To ensure that the service that is delivered to the patient is a service of superior quality, some aspects of the patient journey are still to be evaluated. Improvement programs in telehealth technology must seek the participation of practitioners as important ambassadors for programmatic success (Smith et al, 2020).

Thirdly, for the near future, Telehealth ought to be first, an extension, not a replacement of traditional care services where we shall monitor for those potentially negative effects and mitigate them. A quality improvement system is needed to ensure that services are being provided within best practice guidelines, demanding quality of the care monitoring across all levels regardless of location; by monitoring compliance to standardized treatment protocols, data collection procedures, and professional behaviour.

5.4 Summary and Calls to Action

Telehealth endures to advance in both developed and developing countries within the all-embracing setting of information technology. The former year has brought the vital nature of virtual care to the vanguard. Mitigating the spread of the COVID -19 pandemic has linked isolated patients, provided care for non-COVID-19 patients, and led to the accelerated diffusion of telehealth services. During the COVID-19 pandemic, we have seen the perceptual cycle of ineffective/absent public healthcare processes compounded by lack of access to healthcare services. The provision of health care

services through telehealth technologies has revealed a reassuring effect in the lives of patients, especially during constraints imposed by the pandemic response.

Our review is valuable in producing calls to action to improve the performance of the healthcare ecosystem through Telehealth, in response to pandemics (Figure 2).

Ensure broader accessibility to include unencumbered access for people with disabilities, special needs,

Provide governance oversight through a comprehensive strategy with a quality improvement system to reduce the potential risks of service disruption.

Forge partnerships in the implementation of telehealth that include users of the technology – Care seekers and givers

Include telehealth services disaster risk reduction plans and work on raising the awareness of use, train on better usage to improve preparedness and enhance the resilience of the health provision ecosystem
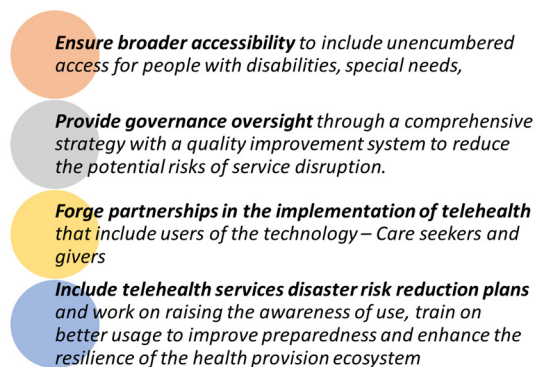
Figure 2: Calls to action to improve the performance of the healthcare ecosystem through Telehealth during pandemics.

Hence, designers and implementers of the telehealth solutions must ensure broader accessibility to include unencumbered access for people with disabilities, special needs, and provide governance and oversight through a comprehensive deployment strategy with a quality improvement system to reduce the potential risks of service disruption.

Moreover, technology developers must forge partnership in the implementation of telehealth that include users of the technology experience (care seekers and givers) for value co-creation to complement the existing complex care ecosystem.

Finally, we call on disaster planners to include telehealth services disaster risk reduction plans and work on raising the awareness of use, train on better usage to improve preparedness and enhance the resilience of the health provision ecosystem.

6 CONCLUSION

The scoping review provides a few lessons from the literature. Telehealth has crossed the stage of disillusionment in the technology hype cycle (Fenn and Raskino, 2008). The technology's potential for mainstream application has become more broadly understood. Telehealth, a mode of providing care at a distance has entered the mainstream largely gated by the latest pandemic needs. We have learned how

Telehealth become a significant mediator for the resilience of the care system during the COVID-19 Pandemic.

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