Flattening the infection curve – understanding the role of telehealth in managing COVID-19

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Abstract

Purpose – This paper aims to discuss the strategic role of telehealth technologies in managing the COVID-19 pandemic.

Design/methodology/approach – This is a viewpoint paper, based on opportune information published and discussed by scholars and managers from different sources; the authors gathered this information to discuss the implications of telehealth during the outbreak.

Findings – Based on examples and benchmarking, the authors found that it is possible to lean on telehealth technologies as a frontline ally to avoid the spread of the virus by tracking, testing and treating (3T’s model).

Research limitations/implications – Together with information published on COVID-19, the authors present their critical observations on the use of telehealth. However, the authors acknowledge that there are restrictions on the use of new technologies in health-care practices that were not addressed by this paper, and they suggest further research to address this limitation.

Practical implications – Governments, health-care organizations and managers are encouraged to take advantage of the information published in this paper. One of the benefits of telehealth is the possibility of bringing patients and physicians together virtually, without the need for physical contact. Henceforth, the authors suggest a more comprehensive implementation of best practices from telehealth to relieve congested health-care facilities and to avoid the risk of further infection.

Social implications – The economic and social impacts of the virus are considered unprecedented by governments worldwide. Therefore, the authors advocate that telehealth practices embedded in health-care practices relieve the pressure that naturally arise during this type of critical event.

Originality/value – In this timely paper, the authors provide invaluable information related to the impact of telehealth technologies on flattening the infection curve of COVID-19.

Keywords COVID-19, Coronavirus, Infection curve, Health-care system, Pandemic, Telehealth, Telemedicine, Technology, Tracking, Testing, Treating

Paper type Viewpoint

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Introduction

A health-care system is a complex service ecosystem, which even under relatively “normal” circumstances, operates under pressure to provide high quality, timely and affordable care (Dobrzykowski et al., 2016). However, critical events such as the COVID-19 pandemic add extra stress on health-care systems (CDC, 2020). The impact on a health-care system is twofold: first, contaminated patients within health-care facilities can increase cross-contamination, with the facility becoming an artificial vector spreading infection from one host to another; second, it creates an unforeseen and unbalanced demand on health-care capacity (Leite et al., 2020).

Several governments have sought to monitor the increased number of infected people and casualties triggered by COVID-19, with the common objective to flatten the infection curve of the virus and to wait for effective medication or a suitable vaccine to be developed (Anderson et al., 2020). The current pandemic has raised awareness about the use of technology and how it can be adopted to flatten the infection curve. Amongst several cutting-edge technologies, telehealth practices (which have already been implemented in a fragmented way) have emerged once again as a means to this end (Archambault, 2020; Gainer, 2020; Imenokhoeva, 2020; Smith et al., 2020). Thus, this paper discusses the strategic role of telehealth technologies in managing the COVID-19 pandemic among health-care systems globally. Specifically, we discuss the role of telehealth technologies for tracking, testing and treating (3T’s) patients, as a set of strategic actions that are helping health-care systems and governments to manage the spread of the virus (Draper, 2020; Mayor, 2020; Smith et al., 2020).

Telehealth technologies: tracking, testing and treating

Telehealth is understood to comprise electronic and telecommunications technologies and services in the provision of care and health services at a distance, within which telemedicine as a practice of medicine using technology to deliver care at a distance might also be adopted (AAFP, 2020). The focus on the former provides a holistic vantage point of remote health-care services, covering both remote clinical and remote nonclinical services. The use of telehealth and associated technologies to track, test and treat COVID-19 is considered the cornerstone of remote health-care management of the virus, as captured by Figure 1.

![Figure 1. 3T’s Model](image-url)
Step 1: tracking
Tracking the disease demographically, geographically and symptomatically is the first step to understanding how the virus spread, considered by many as “the invisible enemy” (Economist, 2020). To track the virus, collaborative telehealth apps have been developed for people to report data on COVID-19. For instance, Mayor (2020) reports on an app developed by researchers to slow the outbreak; the app tracks the spread of coronavirus across the UK; it works in real-time, collecting data from self-reported symptoms, geographical location and demographic information. Apps monitoring the virus have been developed and used by other countries, with data used simultaneously by epidemiologists and to inform scientific modeling.

When quarantine or social distance measures are in place, tracking people’s movement is paramount to understanding whether the population is following government advice. Belgium, South Korea and the USA, for instance, are using mobile technology to trace patients’ whereabouts (Hamilton, 2020). In South Korea, an app alerts officials when people stray from quarantined neighborhoods, whereas, in Singapore, an app based on the public health-care database helps users to avoid areas with high levels of confirmed coronavirus cases. Despite the clear benefits of tracking to manage the outbreak of COVID-19, there is a feeling of “doom and gloom” related to data privacy and government surveillance. There are concerns raised across the globe about data abuse and relaxation of regulations to accelerate the developments of such surveillance technologies (Cho et al., 2020). For example, in Singapore, personal information, such as age, gender, workplace, visited places and contacts with other infected citizens, was made available. Sharing such personal data can harm individuals and incentivize other citizens to lie to authorities, which then undermines data quality (Tennison, 2020). While in such unprecedented times this might be an unfortunate trade-off for citizens to accept this technology application, there needs to be transparency about how data is collected and used, including how and whom it is shared with and for which purpose (Tennison, 2020).

Step 2: testing
According to Dr Tedros Adhanom Ghebreyesus, the Director General of the World Health Organization (WHO), “You can’t fight a fire blindfolded and we cannot stop this pandemic if we don’t know who is infected” (UNifeed, 2020). Therefore, testing is the next crucial step, which is reliant on the outcomes from tracking of emerging “hotspots” of infection to then test the patients. To date, it is not possible to test the global population as test kits are in very short supply globally (Boseley, 2020). As a consequence, testing is focused on frontline medical staff, high-risk groups and severely symptomatic patients (Schwamm, 2020), and telehealth has been used to provide virtual triage (Smith et al., 2020). There are at least two primary telehealth practices in action presently that are related to triage: first, patients are entitled to make a self-assessment using an app based on artificial intelligence to investigate possible symptoms and which then can refer them to the nearest “check-point”; these check-points are usually out of the health-care facilities and organized as a “drive-thru” test (Park, 2020). Second, virtual triage enables patients to access video consultation, whereby a physician can assess their health situation, determining whether or not the patient needs a test or if only to self-isolate. Virtual triage such as this is particularly aligned to the cognitive characteristics of medical decision providing rapid access to specialized care (Hollander and Carr, 2020); a physician can then establish a diagnosis or recommend further physical examination in a health-care facility. Mass testing will also play a crucial role in providing citizens with so-called “immunity passports.” This document could be digital, for example, a COVID-19 immunity passport app. These documents would
allow individuals to show that they have COVID-19 antibodies in their blood and therefore have at least some temporary immunity to the virus, which in turn would allow their exclusion from restrictive lockdown measures for return to work (Proctor et al., 2020).

Step 3: treating
Treating is the final step and follows the outcomes from tracking (#1) and testing (#2). As there is currently no vaccine or medication explicitly for COVID-19 treatment, the treatment phase follows protocols suggested by WHO (2020). For treating quarantined and isolated patients, telehealth plays a strategic role in providing remote access to a physician or other medical staff, who can prescribe appropriate medicine to treat the typical dry coughs reported by COVID-19 patients and fever medicine to treat high temperatures, etc. (Mughal, 2020). Telehealth technologies, such as wearables, also provide basic vital signs (e.g. temperature, heart rate, blood pulse wave) and can produce data for general practitioners to monitor patients at a distance (Draper, 2020). Telehealth does not constrain the physician’s authority to refer a patient to a more suitable health-care treatment, in case, special treatment is required. Indeed, when virtually assessed by a physician during quarantine, patients might be referred to intensive care. Nevertheless, Smith et al. (2020) advocate that for those not infected with the virus, especially the high-risk group (e.g. people over 60, with underlying health conditions), telehealth can provide convenient and safe access to routine treatment, without the need to access a medical facility. Other examples of telehealth use in treatment is mental health support for patients and frontline health workers who may be psychologically affected by the impact of COVID-19 pandemic, as a consequence of self-isolation, anxiety, staff “burnout” and fear of cross-contamination, for instance (Imenokhoeva, 2020; Leite et al., 2020).

Concluding remarks
In this paper, we discussed the strategic role of telehealth in flattening the COVID-19 infection curve. We advocate the implementation of tracking, testing and treating using telehealth technologies in health-care practices. We acknowledge that telehealth provides numerous benefits to a range of health-care stakeholders. However, it is also disruptive and raises challenges for traditional health-care practices. For instance, to date, telehealth has been implemented in a piecemeal way rather than coordinated by an overarching model, and while frequently deployed during unforeseen critical events (e.g. natural disasters and pandemic), it remains atypical in clinical practice. Telehealth and associated technologies can help to save lives. Perhaps, it is time to think about a wider implementation of telehealth as a proactive measure to improve health care, by adopting the 3T’s model. For this to be actionable, ethical and social challenges related to data transparency must be reconciled by governments if they are to achieve “buy-in” from the citizenry and promote broader use of telehealth.

References

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