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Cambodian Youth Perspectives

Edited by

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Chapter 12 | Telehealth in Cambodia: Addressing Challenges of the Healthcare System During COVID-19

Vouchnea TANG

Future Scenario

Despite waking up early, Haratey is rushing to work and simultaneously preparing meals for her sons. In her 40s, Haratey, a wealthy businesswoman and entrepreneur, is very busy with her work and family tasks. She has no time to do exercise and does not always have regular meals. Due to her tight work schedule, she rarely has a health checkup. Having unhealthy and irregular eating habits, she starts to feel pain in the left side of her stomach. She tries to ignore the symptom and focuses on her daily work. But on the advice of her colleagues, she decides to consult with a medical doctor.

In 2080, every Cambodian has health insurance and is able to access healthcare for free. Haratey realizes that she needs to have a medical consultation for her stomach pain, but she is mostly occupied during the daytime. Thanks to technological advancements in the healthcare system, Haratey doesn't have to go to a healthcare facility, instead, she can use a telehealth application on a smartphone. The app is a combination of a telehealth app and an Artificial Intelligence (AI) doctor. Opening the mobile application, she selects the type of service she needs and clicks on the symptoms that she currently has. The app will automatically link her with an AI doctor through a 3D hologram lens equipped in the smartphone. The process is as simple as a face-to-face consultation; however, it requires Haratey to have an external and wearable device for measuring blood pressure, heart rate, glucose level, etc. Haratey doesn't have to tell the AI doctor her basic information as her information is already stored in the telehealth app or transmitted from her wearable device. She simply has to answer the AI doctor's questions and follow instructions as per the AI doctor's request. The consultation takes only a few minutes, and the AI doctor can give her a prescription or refer her to an in-person consultation in the hospital if she needs an additional assessment or treatment from a specialist. The result of the consultation visually shows on the mobile phone and Haratey is relieved to see her condition is not serious. She receives a prescription from the AI doctor for purchasing medicines by herself.

Haratey was very impressed by her experience with the application. Having a telehealth application with a 3D hologram of an AI doctor, saved her time, and she did not have to wait at the triage in the hospital all day. In 2020, telehealth services emerged to help manage the COVID-19 pandemic by providing broad access to big data as well as health care service remotely. It used to take many days to track the contacts of each infected patient but digital health services reduced healthcare workers and surveillance groups' burden in monitoring the outbreak by digital contact tracing.

Haratey is amazed at the current healthcare system and how it fills in the gaps of the classical healthcare system using information technology infrastructure and mobile computing power. She feels blessed to be born in this modern time.

Introduction

After the WHO declared COVID-19 (the disease caused by SARS-CoV-2) a global pandemic, mitigating the impact of the disease became the focus of nearly every country. Even in countries with strong healthcare systems, the overwhelming number of COVID-19 cases caused their healthcare systems to be overstretched. In a lower-income country like Cambodia where the healthcare system is already weak, the threat from COVID-19 is severe.

To slow the spread of the virus, movement restrictions have become the new normal in countries around the world, while many cities or areas were entirely locked down (Papadimos et al., 2018). These regulations are intended to reduce transmission but have significantly affected people who need critical and regular care (particularly older people and those with underlying diseases), delaying their access to treatment and putting them at greater risk of complications from their chronic disease (Papadimos et al., 2018). Consequently, the number of non-COVID-19 deaths in 2020 was higher than the previous year (Jacobson and Jokela, 2020). Given this situation, there is an urgent need for a platform to provide health access to patients without exposure to virus transmission.

This paper explores the importance of digitalization as an innovative solution to improve the Cambodian healthcare system in the future. The ideal scenario, in this view, aims to see the telehealth reduces provider burden and increases patient convenience. Digitalization and Information and Communication Technology can fill the gaps in the current healthcare system, particularly healthcare worker shortage and other barriers that prevent the patient from accessing services. This chapter will explore feasible scenarios and propose a policy solution for Cambodia by introducing the current situation of the healthcare system and exploring policy solutions that high-income countries have used to mitigate the challenges of COVID-19 and improve the healthcare system. Telehealth technology, which is one feasible solution that has been used elsewhere successfully, will be examined as a potential model for Cambodia as a pathway to realize improved outcomes for patients in the future.

Context Analysis

Cambodian healthcare system and challenges

The current healthcare system in Cambodia is constrained by inadequate resources including understaffing, limited diagnostic capacity, and an insufficient supply of medicines and health commodities, all of which result in an inadequate quality of health services (DPHI, 2018). These problems are even more severe in rural areas, triggered by the lack of health professionals and distance to health facilities, as well as limited availability of healthcare services which causes inequity in access to healthcare. There are approximately 19,457 healthcare professionals in

Cambodia, most of which are nurses and midwives, with only 2,157 doctors (Annear et al., 2015, p.89). In 2012, the ratio of medical doctors was 1.51, and specialist doctors was 0.18 per 10,000 population, which is one of the lowest numbers in Southeast Asia (Annear et al., 2015, p.89). Moreover, doctors are mainly concentrated in the capital and at the provincial level. The unequal human resource distribution and inadequacy of supplies and facilities shows the current system cannot provide basic and quality healthcare to all populations.

The increasing number of COVID-19 cases has reduced healthcare access even for non-COVID patients as many hospitals are overwhelmed by the COVID-19 patients who require critical beds, especially during large outbreak (Huzar, 2020). Several factors can restrict people's access to medical care including canceled appointments, suspension of transportation services, fear of being in the emergency room or an altruistic thought not to burden the healthcare system (CDC, 2021). Even when non-COVID patients are able to receive treatment at the healthcare facility, the quality of service delivery might not be the same as previously as facilities might be more crowded or healthcare staff may prioritize the treatment of COVID-19 patients. During the pandemic, the avoidance and delay of non-COVID-19 medical care contributes to excess deaths beyond those caused by COVID-19 (Czeisler et al., 2020). This problem is compounded for Cambodians, who often seek medical care abroad from neighboring countries such as Thailand, Singapore, and Vietnam (Marady and Huaifu, 2017).

Global evidence shows that there have been 1.3 million excess deaths not related to COVID-19 compared to the previous year; the number is mostly attributed to older people and those with chronic health conditions (Jacobson and Jokela, 2020). There is no available data showing whether more older and middle-aged people passed away due to delays of treatment for non-COVID illnesses during the pandemic in Cambodia. However, plenty of anecdotal evidence illustrates that many well-known and high-ranking people lost their lives or their loved ones due to their underlying illness during this epidemic (see for example Rinith, 2021; Khmer Times, 2021; Ben, 2020).

However, it is important to note that even before the pandemic, barriers to accessing healthcare services were a challenge for poor and vulnerable people in rural areas. Jacobs et al. (2012) assessed the barriers to access to healthcare services in low-income Asian countries, in which two case studies in Cambodia were raised responding to the barriers using consequent interventions. The authors found that barriers could be classified as either affecting the supply or the demand side of healthcare services, as shown in Table 1. Demand side challenges include means of transport available, indirect costs to household (transport cost), and lack of health awareness, while supply side challenges refer to service location, unqualified health workers, staff absenteeism and opening hours, waiting time, etc.

To address the supply challenges, performance-based incentives have been introduced in Cambodia to deal with low salaries and motivate health personnel. For a demand-side solution, Health Equity Fund (HEF) provides free healthcare access to the Cambodian poor to increase their access to public health facilities (Jacobs et al., 2012). Even though HEF beneficiaries can access free healthcare services at public health facilities, a large proportion of the poor still seek care at

private health facilities; this is probably attributed to a lower quality of care in the public health sector (World Bank, 2014). Health-seeking behavior is deterred by the cost of transportation, poor quality of care, restricted hours of the facility and long waiting times (Jacobs et al., 2007). In addition, people with disabilities face physical barriers, such as a lack of access to ramps and accessible toilets, and affordable transportation to health centers (Kleinitz et al., 2012). Therefore, free health care service and performance-based incentives cannot fully resolve issues of health care access among all populations.

Table 1: Overview of supply-side and demand-side barriers in four dimensions of access in healthcare

Supply-side barriers	Demand-side barriers
Geographic accessibility	
<ul style="list-style-type: none"> ● Service location 	<ul style="list-style-type: none"> ● Indirect costs to household (transport cost) ● Means of transport available
Availability	
<ul style="list-style-type: none"> ● Unqualified health workers, staff absenteeism, opening hours ● Waiting time ● Motivation of staff ● Drugs, and other consumable ● Non-integration of health services ● Lack of opportunity (exclusion from services) ● Late or no referral 	<ul style="list-style-type: none"> ● Information on health care choice/providers ● Education
Affordability	
<ul style="list-style-type: none"> ● Costs and prices of services ● Public-private dual practices 	<ul style="list-style-type: none"> ● Household resources and willingness to pay ● Opportunity costs ● Cash flow within society
Acceptability	
<ul style="list-style-type: none"> ● Complexity of billing system and inability for patients to know prices beforehand ● Staff interpersonal skills, including trust 	<ul style="list-style-type: none"> ● Households' expectation ● Low self-esteem and little assertiveness ● Community and cultural preferences ● Stigma ● Lack of health awareness

Source: Adapted from Jacobs et al., 2012.

Even though the healthcare system has been improved in recent years, it does not completely respond to factors of patient preference, value, cost, and efficiency (Heskett, 2001). For example, marginalized groups such as people living with disabilities, older people, and people living in remote areas are still facing geographic barriers, logistic barriers, etc., to receiving healthcare. As such, there should be a mechanism initiated to address inequality in access to healthcare for the vulnerable. Kruse et al. (2018) showed that telehealth could reduce the geographical and time obstacles posed by the current system of receiving care.

Telehealth

According to the World Health Organization (2010), telehealth and telemedicine are interchangeable, defined as "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (p.9).

Telehealth aims to provide clinical support, overcome geographical barriers in receiving health care, use various types of Information Communication Technology, and improve health outcomes (WHO, 2010, p.9). Telehealth is used to increase general and specialized health care access, provide healthcare service in rural areas, give flexibility in scheduling and save patients' time and money in receiving health care service (Kruse, et al., 2018).

Before the COVID-19 pandemic, the concept of telehealth had been receiving attention and there were many studies exploring telehealth in recent years (Dorsey and Topol, 2016). Telehealth technology has been proven as an effective, personalized, way to monitor patients with non-communicable disease at home. Srivastava et al. (2018) found telehealth successfully reduced outpatient and urgent care visits, and healthcare-associated costs in patients with heart failure.

Although telehealth technology aims to improve the quality of care, increase patients' satisfaction and reduce cost, it could pose risks to the privacy and personal security of patients' information. The privacy risk refers to patients lacking control over data collection, use, or sharing data and security risks posed by unauthorized access of data during transmission, storage, and collection (Hale and Kvedar, 2014). Even though developers are aware of these risks and have tried to create secure apps, there are still flaws posing a threat to the security of the telehealth systems. Amid the COVID-19 pandemic, the number of healthcare breaches is rising; the rate of data leakage has increased by 51% from the previous year; cyber security like ransomware has also risen (Jercich, 2021).

Telehealth during the pandemic

Using telehealth technology during the pandemic could help to keep both patient and healthcare staff safe, and increase the availability of healthcare staff (Smith et al., 2020; Cheng et al., 2004). To meet the need for social distancing, healthcare staff provide service remotely to patients, especially in non-emergency, routine care, and other services like psychological services that do not require direct patient and provider interaction (Fortney et al., 2007).

Like in many other sectors, telehealth has been expanded and received much attention during the COVID-19 pandemic (Hollander and Carr, 2020). For example, the National Institute of Health in the US will launch a virtual workshop to identify gaps in telehealth services with the aim of expanding telehealth nationwide. Meanwhile, mental telehealth service has been expanded to include vulnerable and rural populations (The White House, 2021).

However, telehealth’s ability to improve patient and population health has predominantly been shown in high-income countries (Scott and Mars, 2015). Table 2 shows the current type of telehealth used in a selection of high-income countries to follow up or check up on COVID-19 patients at home.

Table 2 Type of Telehealth in high-income countries

Country	Type of Telehealth
Iran	Social media platforms including messaging software, WhatsApp, and email
UK	Live video conferencing, mobile, and laptops
USA	Applications including Apple FaceTime, Facebook Messenger video chat, Skype, and Mobile health technology Social media or other digital platforms including telephone, email and videoconferencing
Canada	Electronic medical record, patient portal messaging, digital photography, video using a Health Insurance Portability and Accountability Act-compliant platform, website Social media or other digital platforms including telephone, email and videoconferencing
Italy	Telephone, video, and laptops
Canada	Telephone, electronic medical record, patient portal messaging, digital photography, video using a Health Insurance Portability and Accountability Act-compliant platform, website
China	Combined mode of Massive Open Online Courses micro-video Live video conferencing and mobile

Adapted from Monaghesh & Hajizadeh, 2020

Several countries, particularly China, have utilized telehealth services and have received satisfactory outcomes in managing the number of COVID-19 cases to below 100 per day and the number of deaths to below 500 since March 2020 (Keshvardoost et al., 2020). Other countries have also started to use ICT to respond to the crisis; for example, some virtual health companies in the United States have launched platforms allowing providers and patients to communicate through secure video chat. With legal support from the government, virtual health companies can program telehealth using smartphones with audio and video capabilities to provide health services to remote areas in an unhindered manner (Augenstein, 2020).

The prevalence of telehealth technology is also rising in Southeast Asia. However, it is often in the form of a digital healthcare startup. In some countries, telehealth has become a lucrative business and reached a large number of people. In Indonesia, Halodoc digital healthcare startup has reached 20 million people (Loh, 2020). Singapore telehealth startup, Doctor Anywhere, raised US\$27 million and is looking to expand to Malaysia and the Philippines (Loh, 2020). There are many reasons for the successful growth of telehealth in these contexts including a large market, high levels of digital literacy, government support, the quality of the telehealth service, and user trust, all of which are challenges for the Cambodian telehealth industry.

Telehealth in Cambodia

Telehealth is not yet widely known in Cambodia. A pilot study of telehealth was conducted in rural Cambodia in 2001, requiring nurses to travel to the target village monthly to deliver the telehealth service to the clients by transferring their information through email to the doctors (Brandling-Bennett et al., 2005). The study identified that all patients were either “satisfied” or “very satisfied” and most of them were willing to pay for the services (Brandling-Bennett et al., 2005).

Twenty years later, Meet Doctor, the country’s first telehealth startup, was created driven by the challenge of access to healthcare for people in remote areas (Heng, 2021). Like other telehealth services in high-income countries, Meet Doctor provides medical consultations with a medical specialist through existing communication platforms. However, Meet Doctor has not yet reached many people even during the pandemic as there were only a few hundred clients seeking general consultations from this telehealth service while about a thousand people consulted with physicians around COVID-19 concerns through the application (Heng, 2020).

There are several factors explaining the difficulty in promoting telehealth in Cambodia. First, there are no guidelines and regulations for telehealth and the medical information systems protection used in hospitals and telehealth companies, which are very important to protect personal information online (Nit et al., 2021). Without guidelines, it is risky for companies to invest in telehealth. Patient privacy concerns will be a barrier for this technology to achieve public access to telehealth and reach a massive number of clients.

Besides lacking policy guidelines, the existing telehealth market is small as there is a huge gap in digital skills among the Cambodian population. Among those with tertiary education, only 32.4%

in Cambodia are using computers and the internet compared to 68.1% in Indonesia, and 89.7% in Thailand (Velde et al., 2020, p.22). Moreover, 79% of the total Cambodian population and 90% of Cambodians living in poverty live in rural areas (UNESCO, 2018). Low digital literacy and high poverty rate may raise doubts about the ability of the Cambodian population to possess a digital platform and access telehealth. The speed of mobile data causes another challenge to realize full telehealth's potential since only 50 per 100 inhabitants can access active mobile internet subscriptions (ITU, 2017).

Lacking government support in raising awareness and funding to establish telehealth technology in Cambodia also hinders its potential. Many developed countries have created a friendly policy environment related to telehealth, which builds a strong foundation for successful telehealth in those countries. As an example, the Ministry of Economy and the Ministry of Health in Japan had issued guidelines together stating clear guidelines about the handling of personal information and cloud storage (Nit et al., 2021). Consequently, telehealth is thriving in Japan with one telehealth company asserting 84 million of its users live in Japan while about 16,100 Japanese institutions offered medical services through the telehealth application (Kaneko & Nakagawa, 2020).

While telehealth is prevalent and recognized as routine monitor care in many high-income countries; in Cambodia, where the healthcare system is already overburdened, patients and medical providers are not yet accessing the advantages of telehealth.

Policy Solution

Prerequisite to achieve the proposed policy

The Cambodian health system would benefit greatly from a telehealth system that can respond to the specific health needs of each facility, which could reduce the provider's burden and increase patient's convenience. However, achieving this ideal vision demands technological advancement, supporting policy from the government, and digital literacy from users. To realize full-fledged telehealth in Cambodia, there are several barriers: legal, social, and clinical issues must be considered and the necessary policies put into place.

A telehealth initiative would have difficulty achieving nationwide acceptance unless it is initiated and supported by the government considering its responsibility for setting policy, ability to provide financial incentive, and influence in mobilizing relevant stakeholders in this industry. The government has a very pivotal role in promoting telehealth once it is rolled out to the population. Promotion and support from official government channels will give people confidence in using the telehealth system. The following policies are prerequisites to achieving telehealth in Cambodia:

Government-led telehealth initiative

- Establish relevant regulations and laws that allow Information and Communication Technology (ICT) to be integrated into the healthcare system. This would open an opportunity for telehealth investors abroad or existing health startups to expand their operations without any legal concerns. The government can initiate a national telehealth system or support existing telehealth initiatives in terms of technology and funding.
- Identify a specific focal institution, an inter-ministerial committee, or council to prepare and implement telehealth policy and put it into action. The inter-ministerial committee or council is responsible for coordinating policy and technical support related to health and ICT for any implementing agency.

Ensure that telehealth reaches people who need it, especially vulnerable groups

- All people should have access to digital infrastructure (such as smartphones) to ensure telehealth is accessible to all. Currently, not all people have a smartphone, especially people in rural areas. Making it possible to purchase a phone with monthly payments at very low cost for underserved populations, like poor people in both rural and urban areas, or people with an Identification of Poor Households (IDPoor) card,¹ should be a mechanism to increase telehealth access. This policy initiative should be accompanied by outreach programs and technical support in using new technology to access telehealth to ensure marginalized populations are not excluded (Dorsey and Topol, 2016).
- Identify a low-cost telehealth model that responds to levels of internet capability in the country as well as digital infrastructure (compatible with low-cost smartphones or other portable devices). The design of telehealth has to ensure that people in rural areas can use the service without internet barriers and digital device challenges. The proposed 5G network may provide a favorable environment for telehealth to roll out in rural areas.

Ensure healthcare quality and reduce risk provided by telehealth

- Telehealth focuses on providing medical consultation; its quality is limited due to the nature of remote care as there is no physical examination between physician and patient. Its use should focus on non-emergency service, following up on those who need regular care, and other services such as psychological consultation.
- Prescriptions for high-risk medication should not be provided by telehealth nor should care be given for serious symptoms as it requires a patient to have an initial visit with physicians (Dorsey and Topol, 2016). There should be a referral system within the telehealth application to an in-person consultation if the patient's symptoms are high risk or likely to develop into high risk. Moreover, home-visits from physicians should be activated to increase patient's convenience, especially for vulnerable groups, such as people with limited mobility and disabilities, and older people.

¹ Identification of Poor Households (IDPoor) mechanism is a social registry system to identify poor and vulnerable households, so they can access social, healthcare, and other services benefits (Doetinchem, n.d.).

Cooperate with in-country insurance providers to ensure that beneficiaries can access telehealth

- People covered by health insurance should be able to access telehealth and have the service charged by their insurance provider. There are three social health schemes: Health Equity Funds for the poor, Social Health Insurance for civil servants (NSSFC) and the private sector under NSSF (WHO, 2019). The fragmentation of health insurance is another barrier for telehealth to expand to all populations, as only approximately 4.7 million Cambodians are insured by a healthcare scheme (Kolesar, 2019). Universal Health Coverage has not been realized, posing a challenge for full national access to telehealth. However, telehealth could be designed to be inclusive to people who are not covered by health insurance. For example, they could register themselves, use the service, and pay for it through internet banking or cash.
- If the telehealth operates nationwide, there will be challenges related to data management because of the fragmentation among multiple health providers and due to the sheer number of patients. Therefore, an electronic medical record system should be used to store patient medical information in telehealth. The system should link to current national hospital management, like Patient Management and Registration System (PMRS)², as a single operator to enhance the electronic medical record management. This way, physicians at public health facilities can access the patient's electronic medical records when they have an in-person consultation.

Collaborate with non-state actors to achieve sustainable telehealth

- It is crucial that the design of telehealth should involve many actors, including the government, private sector, donors, international organizations, and others. In other countries, the telehealth system has typically been operated by private sector partners, as the private sector may have strong technological and management skills, fostering an innovative design of telehealth. Moreover, a public-private partnership could open an investment opportunity, contributing to telehealth's financial sustainability. With finance and skills flowing from the private sector, the government must provide the legal framework for the public-private partnership by establishing laws and guidelines for digital health or telehealth.
- Donors and international organizations could provide technical assistance and funding and work hand in hand with the government to monitor and evaluate telehealth compliance and other legal aspects to increase healthcare quality or to achieve further goals.

² Patient Management and Registration System (PMRS) is internet-based system used by public health facilities in Cambodia for managing patient records, particularly Health Equity Fund beneficiaries and partly expanding to record non HEF beneficiaries for referral hospitals (DPHI, 2016).

Establishment of guidelines and policies enabling a friendly environment for developers and increasing the number of users

- Telehealth cannot maximize its impact and success without policies and guidelines related to telehealth. Moreover, the current policies do not provide specific or sufficient guidelines or regulations to developers. There should be policies that give telehealth providers clear guidelines and regulations, such as payment policy, payment rate, the definition of the type of care, etc., to ensure consistency and regulate all providers.
- To achieve telehealth's full potential, patient privacy and data security must be ensured. Data encryption for only authorized users could protect patients' privacy. The data is very crucial as well as risky for patient privacy if it is not stored and managed properly. There should be one single operator or agency to oversee and enforce telehealth privacy and security regulations. With these regulations and guidelines in place, patients can be confident to use the telehealth service without privacy concerns.

Scope of the telehealth

During the pandemic, the current telehealth design aims to relieve the provider's burden and increase patient access but its efficiency and effectiveness are limited due to the limitation of current digitalization and technology. Current telehealth models partly reduce the provider's administration work and out-patient consultation, but not all provider's tasks. With existing technology, telehealth can help patients to eliminate the risk of communicable diseases, and receive regular care. However, providers face limitations in their work due to the need to provide consultation services through communication platforms. Telehealth can be improved when complemented by wearable and self-care equipment such as glucometers, blood pressure monitors, pulse oximeters, and digital stethoscopes (Scott and Mars, 2015). The current telehealth models are limited to consultations and mainly address non-emergency cases, which is very applicable and helpful to older people and other vulnerable groups. However, there should be further research on telehealth to maximize effectiveness based on an innovative design responding to people's needs. Moreover, more research studies in telehealth are needed to explore feasibility models to implement telehealth in Cambodia as there is currently very little data available.

Conclusion

The telehealth industry has been growing in high-income countries during the pandemic. These systems can improve access to health services for those who need regular care and follow-up while reducing the risk of transmission. In the long term, telehealth could be a partial solution to address the shortage of health workers and specialists in Cambodia and eliminate physical barriers to attain equity access at healthcare facilities. Building a telehealth system will need political will and government support, digital literacy among users, as well as digital infrastructure. It seems arduous for lower-income countries like Cambodia to achieve this now, but as the positive outcomes are potentially considerable, it is worth investing in telehealth. Telehealth should not only help to address the current problems posed by the pandemic, but it

also needs to go beyond COVID-19 to be part of the solution to long-standing health care challenges.

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