

IMPLEMENTATION OF A VIRTUAL CONSULTATION PLATFORM (VCP) FOR HEALTHCARE PROVIDERS INTEGRATED WITH A PATIENT-FACING MOBILE APPLICATION

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policy brief

Key Messages

- NUHS telemedicine service was developed to improve patients' and caregivers' convenience in accessing patient care and to prepare for future crises that hinder in-person clinical consultation
- The key enablers of the telemedicine service were mainly due to strong cross-collaboration between the cross-functional delivery teams in NUHS and Synapse Pte. Ltd. that supports technical development of the service and Covid-19 that increased the uptake
- An automated scheduling process, namely the Virtual Consultation Platform, has helped to alleviate the burden of healthcare providers' staff due to the additional work process of telemedicine provision
- NUHS is exploring the use of telemedicine that will be expanded beyond existing outpatient appointments

Background

Telemedicine is an intervention used as an innovative solution to tackle the challenge of equitable access to health services. Thailand is currently actively working to establish a nationwide telemedicine system. Nevertheless, the widespread implementation of telemedicine across the country has encountered many challenges. To effectively identify these challenges, a qualitative study was conducted to identify the key gaps in the provision of telemedicine services in Thailand. To supplement the findings of this study, an international case study was subsequently undertaken to gain a broader perspective on the challenges faced in telemedicine. The objective of this case study was to identify and assess the ways in which other countries are addressing the gaps similar to those seen in Thailand. As a part of this case study, telemedicine services from India and Singapore were closely examined.

This policy brief aims to provide an overview of the National Health University System (NUHS), Singapore's telemedicine service. The document will delve into the origins of the service, its implementation process, and the factors contributing to its successful execution.

Methods

An open call for telemedicine case study was widely promoted through the Health Intervention and Technology Assessment Program's (HITAP) existing networks. This was an opportunity to identify case studies of telemedicine service delivery beyond those present in academic literature and engage with the telemedicine implementers. Following this call, submitted case studies were presented to relevant stakeholders in Thailand, who subsequently selected two specific cases, namely OneNUHS and eSanjeevani, for an in-depth study. Following the identification of the case studies, semi-structured interviews with the case study authors were carried out. The transcripts were coded by HITAP researchers and triangulated with document reviews. Cases were described narratively and validated with the corresponding telemedicine implementers.

About the National University Health System, Singapore

The National University Health System (NUHS) Singapore is one of three public healthcare clusters in Singapore that covers about 1 million residents of West Singapore [1]. Under 21 healthcare providers, consisting of three tertiary hospitals, three acute hospitals, two community hospitals, three national specialty centers, seven polyclinics, three family medicine clinics, and three primary care networks.

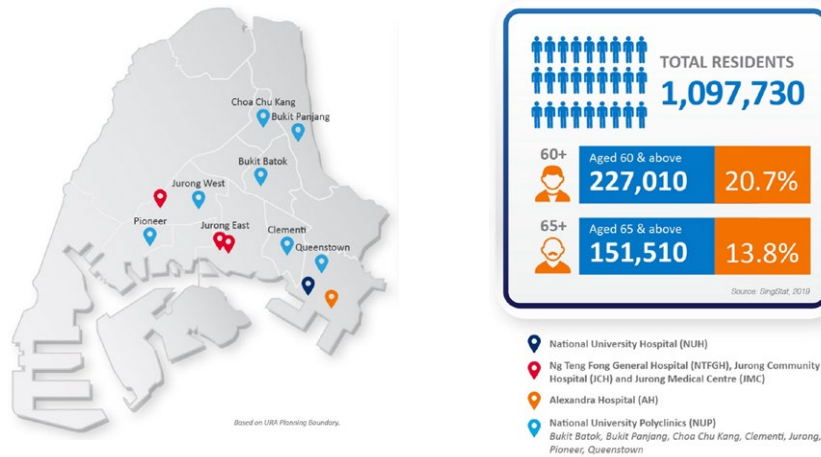


Figure 1. NUHS institutions and catchment area (West Singapore) [1]

Inception of the telemedicine service

Before the COVID-19 pandemic, NUHS institutions had already started using telemedicine to enhance patient care. However, implementation was fragmented with each institution taking individual initiatives. NUHS group realised the future potential use of telemedicine in patient care; thus, made a concerted effort to adopt telemedicine across all institutions.

The main objectives for developing the telemedicine service were to:

- **Convenience** – facilitates access to care for patients with low mobility while reducing the need for caregivers to take leave from work to accompany the patient on a physical visit.

- **Future Proof** – be prepared for future crises that disallow patients to have an in-person consultation and ensure continuation of care.

An initial step was to understand the size of the demand, capacity and capability of the staff and digital infrastructure in each institution. A team was formed at the NUHS group to develop a telemedicine feature, with technical support from Synapse Pte. Ltd., a national health technology agency supporting government institutions in developing digital technologies [2]. This service was piloted in Alexandra Hospital in August 2021 – a first for public healthcare in Singapore and was subsequently scaled up across all the hospitals and polyclinics in NUHS.

Overview of the telemedicine service

The telemedicine service was developed as a feature in the OneNUHS App, a mobile application available to patients across all institutions under NUHS [3]. The service allows patients to have online consultations with their physicians and order their prescriptions, if applicable.

From the patients' perspective

Through OneNUHS, patients and caregivers can manage their appointments (Figure 2) after logging in with their Singpass [4], a trusted digital identity of Singapore residents providing convenient and secure access to government and private sector services online. On the day of their consultation, patients will receive a notification, view the estimated waiting time and their queue status. After the consultation, patients will be asked to confirm the purchase of prescribed medication and select whether they would like the medication delivered or be made available for self-pickup before being directed to the payment page.

From the providers' perspective

NUHS found that online consultations created an extra burden on the healthcare providers' staff, as it involved a separate process from in-person consultations. This process included setting up a virtual meeting link, sending the link to patients, sending reminders, and preparing a device for the physicians to conduct the consultation. Moreover, without a proper system, this process was susceptible to human errors.

NUHS introduced a Virtual Consultation Platform (VCP) with technical assistance from Synapxe Pte. Ltd. This platform streamlines the process of providing online consultations and reduces the workload of providers' staff (Figure 3). The VCP interfaces with the NUHS electronic medical records system, Epic, to extract a list of upcoming video consultation appointments. VCP then automatically schedules a corresponding Zoom meeting and sends this information to the patient via the OneNUHS App. On the consultation day, clinicians can launch the video consultation directly from the VCP platform.

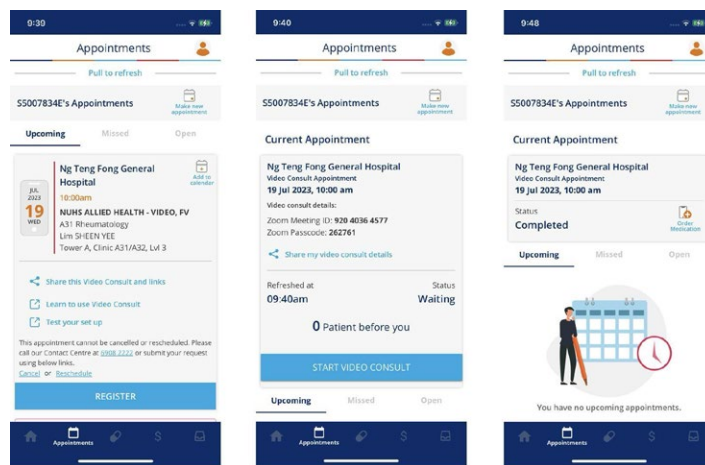


Figure 2. OneNUHS interface on the appointment page (source: OneNUHS application)

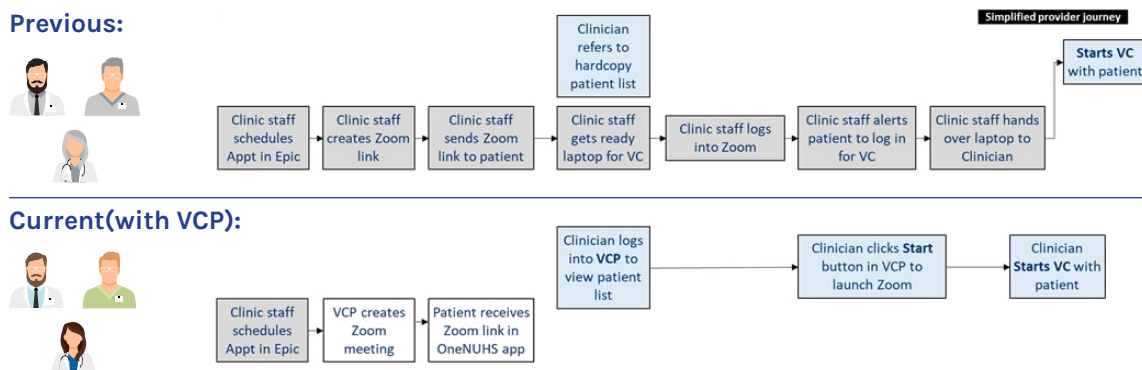


Figure 3. Workflow comparison before and after the implementation of VCP

Evolution of the telemedicine service

COVID-19 elevated digital initiatives from a "nice-to-have" to the new normal in healthcare, which escalated the service uptake. NUHS leveraged this burning platform to transform patient experience and care by using telemedicine to provide patients with repeat visits and ongoing care remotely via video-conferencing tools where in-person clinical consultations are not necessary or not possible.

The patient and provider experiences for conducting telemedicine through NUHS digital platforms have been continuously improved. NUHS focused on reducing the barriers to adoption by:

- Addressing usability concerns
- Focusing on education for staff and users.

Some notable improvements include increasing the default session timeout length to reduce the need for repeated sign-ins by providers and developing the ability for providers to trigger pre-defined messages to patients to provide them with timely updates while waiting for their consultation.

Monitoring and impact evaluation of the telemedicine service

With the aforementioned objectives of the service, NUHS focuses on evaluating the impact on the uptake of the service, user experience and satisfaction. Additionally, on-boarding the telemedicine service to the OneNUHS application and adding the VCP feature were intended to:

- Minimize the amount of manual processing required by the staff when scheduling video consultations,
- Present healthcare providers with a single consolidated view of their patient lists for the clinic session,
- Provide patients with support throughout the entire video consultation session, from registration, consultation, ordering of medication and payment, and
- Develop a user interface (UI) that enables users with basic tech literacy to adopt the service.

NUHS monitors the number of teleconsultations per specialty in each institution and the polyclinics monthly. This also includes the proportion of video teleconsultations that were carried out through the OneNUHS App. In addition, the project team meets with the clinical operations teams monthly to review processes and to plan future improvements.

User experience and satisfaction are monitored via feedback from various channels such as the Apple Store, Google Play Store, support email and contact centre.

Barriers and mitigation of impediments to use of the telemedicine service

Variation in operational workflows between institutions

To address this issue, a cluster work group was formed, comprised of Telemedicine Operations Lead appointed by each institution to understand the differences and user needs to establish a viable common solution.

Singpass as an on-boarding requirement

Access to the OneNUHS app is secured with Singpass to ensure the safety of user

authentication before allowing access to patient information. However, this requirement creates barriers for certain segments of patients who do not have Singpass credentials. To address this issue, manual workflows have been implemented to ensure that teleconsultation services are still available to these groups (e.g., sending links for teleconsultations or medication orders via email).

Way forward

Going forward, NUHS is exploring how the platforms can be expanded beyond existing outpatient appointments to deliver care across a wider spectrum (e.g. right siting of care and post-discharge support).

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