eSanjeevani, the National Telemedicine service: Bridging healthcare gaps in India

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Key messages

- eSanjeevani was developed primarily to tackle the challenges of inequitable healthcare access and the shortage of healthcare professionals in India
- The 'one application' approach ensured that only one application is used for the national telemedicine service delivery, thus ensuring interoperability among different healthcare systems
- Provider-to-provider types of teleconsultations, involving healthcare workers at primary healthcare facilities and doctors at tertiary healthcare facilities, allows eSanjeevani to address the digital literacy challenges prevalent in rural India
- One key enabling factor for the implementation of eSanjeevani was the establishment of dedicated workforce solely for digital service delivery, thereby preventing an undue burden on the existing workforce

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 and to gain a broader perspective on the challenges faced in telemedicine, an international case study was subsequently undertaken. The objective of this case study was to identify and assess the ways in which other countries are addressing the gaps similar to that seen in Thailand. As a part of this case study, telemedicine services from India and Singapore were looked into closely.

This policy brief aims to provide an overview of India's national telemedicine service, eSanjeevani. 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, all received 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.

policy brief

Rationale for the development of eSanjeevani

India, as the world's most populous nation with over a billion people, faces significant challenges in ensuring the equitable distribution of healthcare services. The concentration of healthcare facilities in urban areas, coupled with nearly 70% of the national population residing in rural India is often cited as a major challenge is healthcare access in India [1]. Adding to this challenge is the shortage of healthcare professionals. Studies indicate that India requires an additional 1.8 million healthcare workers to meet the World Health Organization's recommended standard of a 1:1000 doctor-to-population ratio [2]. Furthermore, tertiary and secondary healthcare facilities often bear the burden of tasks that could have been efficiently managed at primary healthcare centres, thus compromising the qualit

of care provided [3]. These factors undeniably impact India's healthcare delivery system.

To tackle these multifaceted challenges, the Government of India introduced the Ayushman Bharat scheme in 2018 with the overarching goal of achieving Universal Health Coverage (UHC) [4]. Within this scheme, eSanjeevani – the National Telemedicine Service of India emerged as a telemedicine solution aimed at providing comprehensive primary healthcare and specialist consultations. eSanjeevani allows easy access to healthcare through its smart phones applications or by visiting the nearest healthcare centre for a provider-to-provider remote consultation.

Genesis of eSanjeevani from Sanjeevani

The origins of the present-day eSanjeevani platform can be traced back to a pilot project titled 'Development of Telemedicine Technology' initiated by the Ministry of Communications and Information Technology in collaboration with the Ministry of Health and Family Welfare (MoHFW) in the year 1999 in India [6]. The objective of this pilot initiative was not only to enhance the national healthcare delivery system but also to optimise the utilisation of medical resources.

The implementation of the telemedicine system under this pilot project at three tertiary hospitals in the country, was achieved by creating an indigenous telemedicine platform developed by the Centre for Development of Advanced Computing (C-DAC), Mohali [5,6], an autonomous scientific body operating under the Ministry of Electronics and Information Technology.

At the core of the then telemedicine solution was the integrated software named 'Sanjeevani', that provided **doctor-to-doctor teleconsultations** by consolidating patient information into Electronic Patient Records (EPRs). Sanjeevani also offered imaging capabilities for digitised radiographic images and ensured efficient data transfer and real-time hardware-based video conferencing.

Subsequently, after the decision to establish a nationwide telemedicine service under the Ayushma Bharat scheme, a survey was conducted to identify and assess all telemedicine applications that were currently in use across the country. The objective of this survey was to pinpoint a single telemedicine service suitable for nationwide implementation. The goal of this **"One Application"** approach was to eliminate the silos in telemedicine projects and establish interoperability among various healthcare systems. As a result of this assessment, C-DAC's Sanjeevani was selected for a nationwide rollout by the MoHFW as 'eSanjeevani'. Several reasons supported the selection of eSanjeevani as the national telemedicine platform:
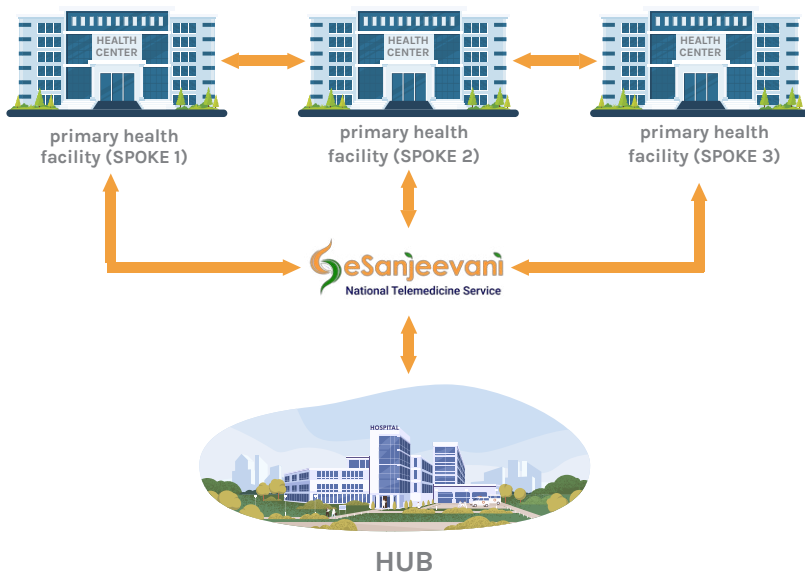
    1. User-Friendly and Intuitive Interface: eSanjeevani was designed with input from medical experts, resulting in a user-friendly and intuitive interface.

    2. Proven Track Record: eSanjeevani had a track record of being used in India from 1999. Additionally, it had been implemented in four other countries, namely Myanmar, Tanzania, Armenia, and Kyrgyzstan, through bilateral arrangements.

    3. Government Compliance: As a Government institution, C-DAC ensured that the service it developed complied with the data privacy and confidentiality standards of the Government of India.

Implementing eSanjeevani: A closer look

eSanjaaveni started its operations in November 2019 by providing population level doctor-to-doctor teleconsultations, under a variant called eSanjeevani Ayushman Bharat Health and Wellness Centers (eSanjeevani AB-HWC). eSanjeevani was designated for implementation following a 'Hub and Spoke Model' architecture to provide this doctor-to-doctor consultation. **Figure 1** illustrates the 'Hub and Spoke Model' of telemedicine service delivery.

The tertiary or secondary level hospitals in the country act as Hubs of telemedicine service provision. These Hubs are equipped with dedicated telemedicine departments or centres which can deliver remote consultation and prescription to the Spokes. These dedicated telemedicine centres ensure that the newly introduced telemedicine service does not cause added workload to the already overburdened healthcare workforce. The Spokes are typically the primary level hospitals. **Figure 2** illustrates the patient's journey when they seek medical assistance at a primary care centre, where the healthcare practitioner conducts a remote consultation with a specialist at the hub.

Figure 1: Schematic representation of the 'Hub and Spoke model' of telemedicine service deliverry.

Subsequently, the 2020 COVID-19 pandemic induced lockdown led to the regular Outpatient Departments (OPDs) being closed, necessitating the introduction of a patient-to-doctor teleconsultation service alongside the previously established doctor-to-doctor variant of eSanjeevani. In response to this demand, eSanjeevani OPD, a patient-to-doctor teleconsultation service, was introduced in April 2020.

Figure 1: Patient journey from their visit to HWC to e-prescription. Adopted from eSanjeevani's official website. CHO: Chief Health Officer, HWC: Health and Wellness Centre

eSanjeevani is available as a web-application as well as in the form of Android and iOS mobile applications. Users in the doctor-to-doctor variant access eSanjeevani on laptops, desktops and tablets even, whereas majority of the beneficiaries/patients of patient-to-doctor variant of eSanjeevani use eSanjeevani through mobile devices/smartphones.

The entire process and data uploaded on eSanjeevani is secured by its developers. All stakeholders have their login IDs and passwords to access their data and provide consultations. System monitoring is conducted by administrators at the district, state, and national levels. C-DAC, Mohali, has full access to nationwide data. Monitoring administrators at each level can check user attendance, the number of consultations, average consultation times, consultation summaries, and dormant summaries through a dashboard module. This allows for continuous monitoring, thus providing a pathway to address the anticipated and unanticipated challenges in service delivery.

Impact of eSanjeevani

With its very large volume of teleconsultations, eSanjeevani has evolved into the world's largest telemedicine implementation platform in primary healthcare. Reports suggests that the number of consultations facilitated by eSanjeevani has grown exponentially since its inception in 2019, with COVID-19 serving as a catalyst for this increase in uptake. Currently, eSanjeevani operates through 131,538 Health and Wellness Centres (HWCs) as spokes and over 16,000 as hubs. eSanjeevani boasts over 235,000 doctors, specialists, and health workers as telemedicine practitioners, operating in all states and union territories of India. It serves approximately 450,000 patients daily, with the capacity to handle up to 1 million patients per day.

Enablers and barriers

The driving force behind the initiation of digital health services in the country was the escalating demand for healthcare services in proportion to the increasing population, especially in the rural areas. During the COVID-19 pandemic, when in-person healthcare services were disrupted, digital health services became imperative, leading to the widespread adoption of e-Sanjeevani nationwide. Notably, the establishment of dedicated telemedicine departments or centres, staffed by specialists and super-specialists hired explicitly for the purpose of delivering teleconsultations, has been mentioned as a facilitator in expanding the service's reach without overloading the existing service providers.

Barriers to the inception of telemedicine services included providing reliable internet connectivity to every healthcare centre, especially in rural settings, and creating user-friendly software. In India, healthcare is a state subject, so the states took on these challenges by providing internet connectivity, necessary hardware, and other facilities required for teleconsultations. e-Sanjeevani developers made the platform user-friendly to ensure that both patients and doctors can easily fill out electronic health records to initiate consultations.

Way forward

Going forward, eSanjeevani is planning to integrate Artificial Intelligence models into the platform with the aim of enhancing data collection, elevating the quality of care, and ensuring quality assurance of the teleconsultations.
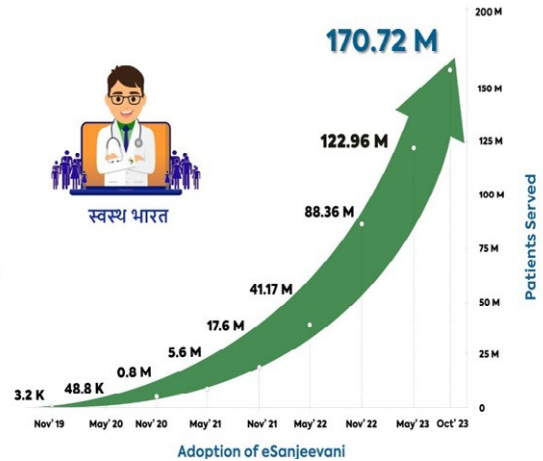

Figure 2: Number of teleconsultations facilitated by eSanjeevani from November 2019 to October 2023

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