WHO & Intelehealth's Webinar Series (Telemedicine Thursdays): Telemedicine for Healthcare in Low-and Middle-Income Countries

intelehealth

World Health Organization
REGIONAL OFFICE FOR South-East Asia

Telemedicine In Action: Transforming healthcare in LMICs

Brick-and-mortar to Brick-and-click - Designing & Implementing Quality, Effective, and Impactful Telemedicine Programs

Target Audience , Objectives and Outcomes

Objectives:

The session will draw from real-world experiences and lessons learned in various global settings, highlighting effective strategies, challenges, and key considerations for achieving impactful telemedicine programs that address local healthcare needs.

Target Audience:

- Ministries of Health
- NGOs & Hospitals
- Academia
- Medical professionals

Expected Outcomes: By the end of the webinar, participants will:

- Understand the key components of quality and impactful telemedicine programs.
- Receive practical guidance on how to design or scale telemedicine programs in their own regions.
- Learn about key performance metrics for assessing the impact and success of telemedicine programs.
- Receive practical guidance on how to design or scale telemedicine programs in their own regions.

Webinar Agenda

S.No	Time	Details	Speaker/Moderator
1	02.00 PM- 02.05 PM	Introductory Remarks	Dr. Neha Verma
2	02.05 PM- 02.20 PM	Telemedicine program design canvas Brick-and-mortar to Brick-and-click.	Dr. Neha Verma
3	02.20 PM- 02.35 PM	Remote Patient Monitoring post-surgery, how to design	Dr. Filip Dumez
4	02.35 PM- 02.50 PM	Designing and Implementing Quality, Effective and Impactful Telemedicine Programs	Dr. Saif Khairat
5	02.50 PM- 03.00 PM	Wrap Up	Dr. Neha Verma
6	03.00 PM- 03.25PM	Q&A	Dr. Neha Verma
7	03.25PM – 03.30PM	Closing Remarks	Dr. Neha Verma

Webinar Faculty

Dr. Saif Khairat is the Beerstecher-Blackwell Distinguished Professor at UNC-Chapel Hill, and the principal investigator of the NIH-funded Center for Virtual Care Value and Equity (ViVE). Dr. Khairat is an expert in digital health who has authored over 100 publications, secured $7.5M in funding, and is a digital health advisor to the WHO. He holds a PhD in Health Informatics and master's degrees in Computer Science and Public Health.

Dr. Saif Khairat

Dr. Filip Dumez
Msc International Healthcare Management & Health Service Research (Aberdeen University, UK)
Msc Hospital Management (KU Leuven, Belgium)
Certified Prince 2 © Project Manager
Quality Excellence Coach in Healthcare and Services Sector
Strategic Officer in Hospitals and Senior Manager EU projects

Dr. Filip Dumez

Neha is the Co-founder and CEO of Intelehealth, a telemedicine technology non-profit that delivers health services where there is no doctor. She is an entrepreneur and medical information engineer. She earned an MS in Applied Health Sciences and a PhD in Health Informatics from the Johns Hopkins University School of Medicine. Neha is also an active contributor for Women@Forbes, writing about women in tech, product development, organizational strategy, social impact and nonprofits.

Dr. Neha Verma

Webinar Topics and Dates

Sno	Date	Topic
1	06 March 2025	What is Telemedicine and How Are Health Systems Using It Globally? A Primer for Health System Leaders
2	10 April, 2025	Brick-and-mortar to Brick-and-click - Designing & Implementing Quality, Effective, and Impactful Telemedicine Programs
3	08 May, 2025	Evaluating telemedicine interventions: Evidence so far, and Methodologies
4	5 June, 2025	Creating a Telemedicine-Ready Healthcare Workforce: Training for Healthcare Providers
5	10 July, 2025	Telemedicine Policy: How Telemedicine is Regulated in Asia
6	7 August, 2025	Choosing a Telemedicine Software: The case for standards-compliant, interoperable & open-source Digital Public Goods (DPGs)
7	11 September, 2025	Ensuring Quality of Care & Patient safety in Telemedicine
8	9 October, 2025	Telemedicine Adoption by Communities – How Might We Drive Uptake of Telemedicine (TM) by Citizens?
9	6 November, 2025	Artificial Intelligence and Machine Learning in Telemedicine
10	4 December, 2025	Financing Telemedicine and ROI – The Business Case for Telemedicine
11	8 January, 2026	Telemedicine use cases to advance the SDGs - Part 1 Applications for Non-Communicable Diseases (Diabetes, Hypertension, Cardiovascular disease, Cancer and Mental Health)
12	5 February, 2026	Telemedicine uses to advance the SDGs - Part 2 Applications for Communicable Diseases (Tuberculosis, HIV)
13	12 March, 2026	Telemedicine use cases to advance the SDGs - Part 3 Applications for Primary Healthcare

Case Study I

Remote Patient Monitoring post surgery, how to design

FILIP DUMEZ
TOM IMBERECHTS
FILIP VANRYKEL

Definition

Telemonitoring or '**remote patient monitoring**' (RPM) or 'remote care' or 'care at a distance': Measurements and queries are collected from the patient by means of **digital technologies** to monitor and capture medical and other **health data** from patients (at a distance) and electronically **transmit this information** to healthcare providers for assessment. It is a technology to enable monitoring of patients **outside of conventional clinical settings**, such as in the home or in a remote area.

(KCE report 354, 2022)

Remote patient monitoring (RPM) can be defined as "a mode of healthcare delivery that gathers and integrates patient data outside of traditional healthcare settings, allowing providers to **track, assess, and engage patients regardless of location**." RPM can thus constitute an alternative (but also a complement) to conventional care, with potential **social and economic value** for both patients and providers.

(Miranda et al, 2023)

The (expected) intervention outcomes when telemonitoring is implemented

Patient care and health outcomes => positive effect on :

- Self-care or patient empowerment
- Quality of care
- Patient education
- Symptoms of disease
- Quality of life

Organisation and system outcomes :

- Treat more patients (and reduce admission and visits)
- Reduce workload
- Reduce costs
- Improve adherence to guidelines
- Contribute to continuity of care

(Gijsbers et al, 2022)

The (expected) intervention outcomes when telemonitoring is implemented

BUT WE FIND MIXED RESULTS IN LITERATURE !

⇒Methodological differences – Research

⇒Methodological differences – Implementation

⇒**Incomplete approach and lack of know how**

⇒**No alignment with existing care process**

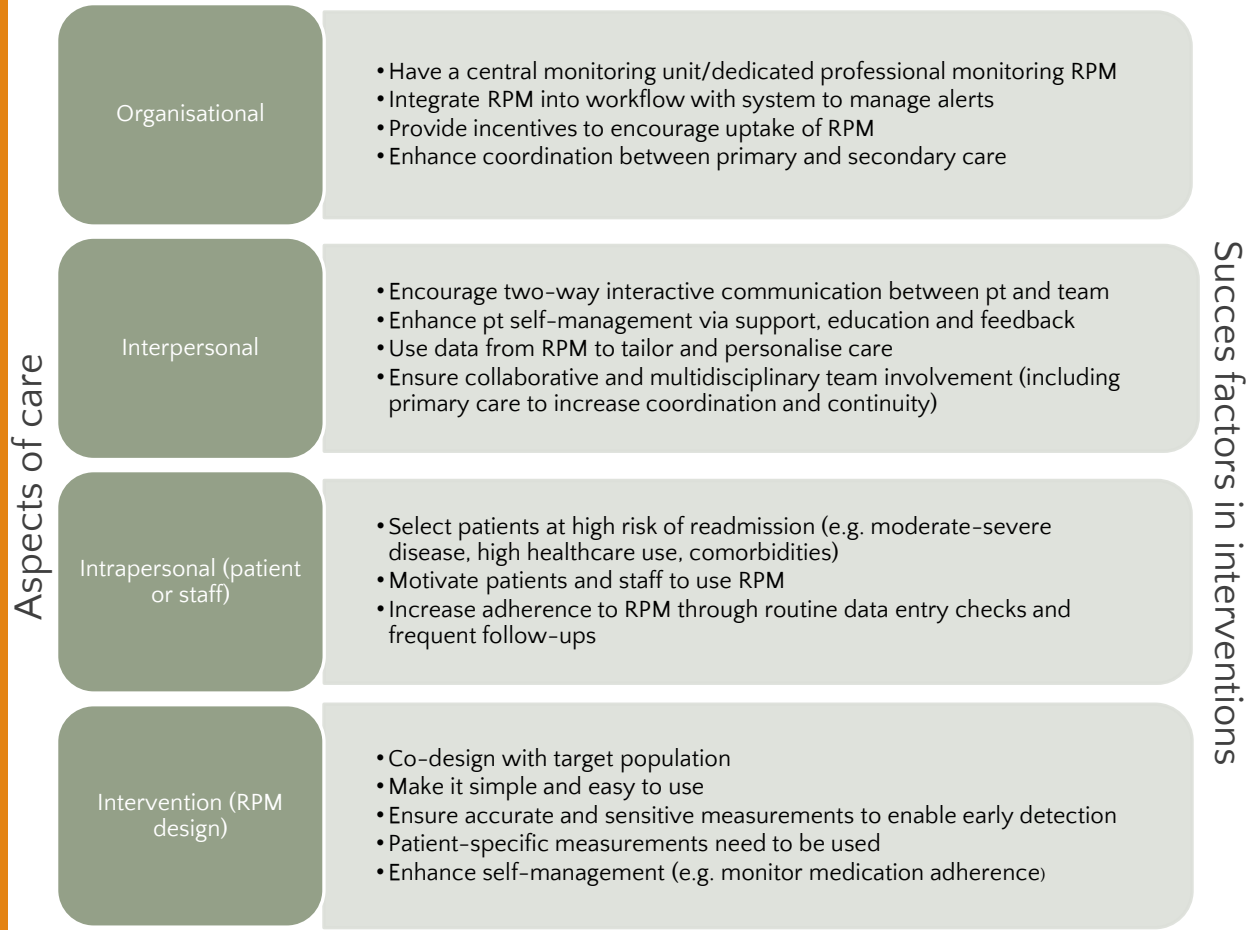
(Christensen et al 2018, Dawes et al 2021, Taylor et al 2021, KCE report 354 a, Verma et al 2022, Ekstedt et al 2023)

Challenges **specific** for RPM projects?

- Data collection
- Reliability and validity of data
- Interoperability
- Authorization, authentication, access
- Aggregation of data
- Relevant dashboard
- Clinical algorithms
- Threshold values
- Acceptance
- Effectiveness
- Digital literacy
- Reimbursement
- Legislation, GDPR, MDR
- Profitability
- Match with ecosystem

(Roderick et al 2016, Lakmini et al 2019, Thomas et al 2021, Gijsbers et al 2022, KCE report 354a 2022, De France et al 2023, Liljeroos et al 2023, Miranda et al 2023)

Solution?

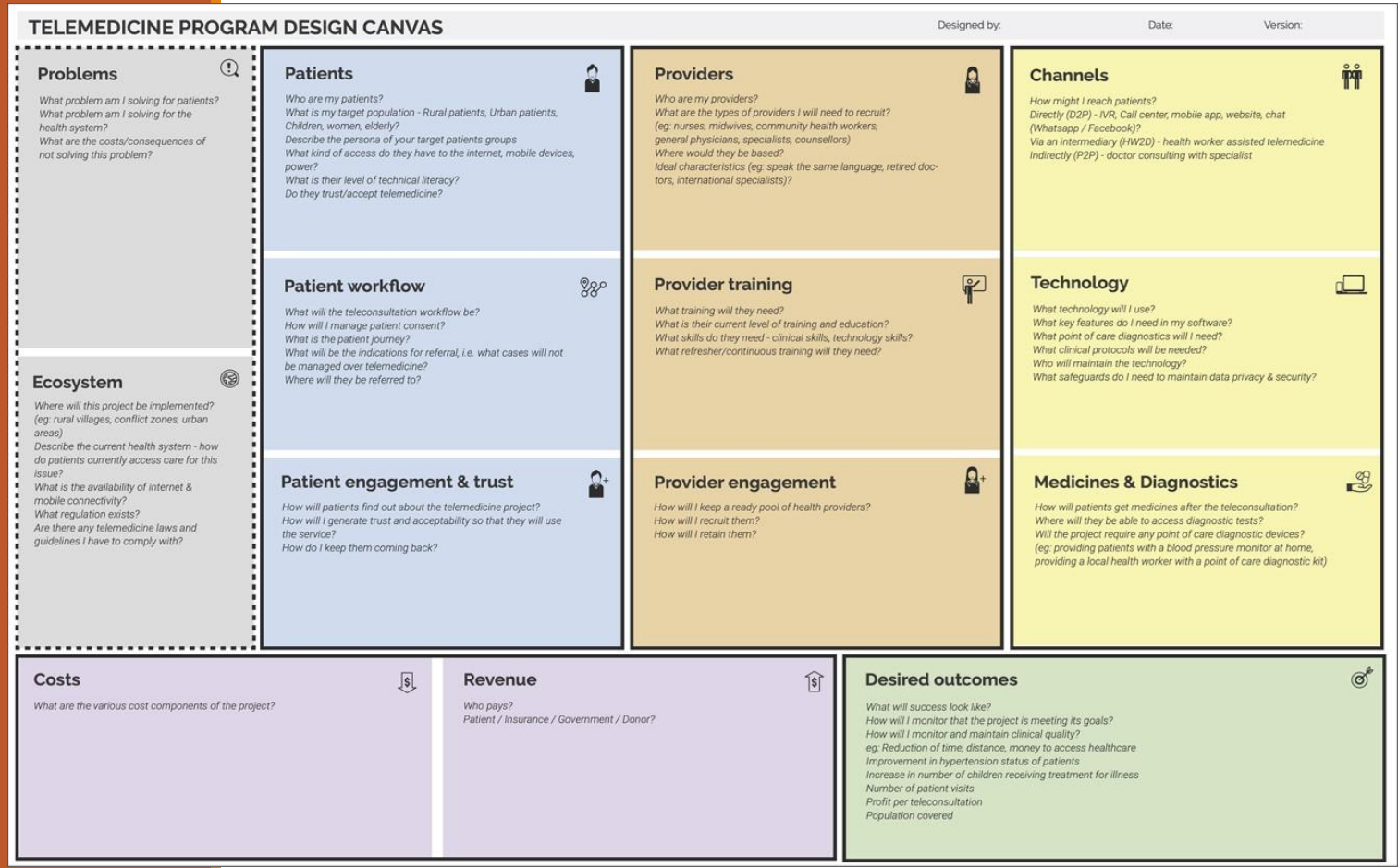


(Thomas et al 2021)

Solution?

DESIGN AND ALIGN:

1. DEFINE THE CONCEPT
2. INITIATE THE PROJECT
3. DEVELOP THE CARE PATH
4. TEST AND IMPLEMENT



Verma et al. The Telemedicine Program Design Canvas: a visual tool for planning telemedicine interventions, *Oxford Open Digital Health*, Volume 1, 2023, ogac002, https://doi.org/10.1093/oodh/ogac002

Use cases

Large bowel surgery
From start to implementation:
- 1st time: 9 months; Now: 6 months
- 3 months is achievable through a structured approach

Outcome large bowel surgery
- 75 patients included.
- Length of stay: Median from 6 to 2 days, Average from 9 to 3 days.
- Safety: No false positives or negatives
- Patient satisfaction: +90% overall patient satisfaction.

Other use cases (FOD innovation project)
Bariatric surgery / Kidney surgery / Bladder surgery / Pancreatic surgery / Anti reflux surgery

Implementing RPM:

Take away messages

- Use a conceptual framework (TPDC is useful at organizational level)
- Be aware of barriers and enablers
- Align with existing care pathways
- Use an implementation strategy (projectmanagement)
- Pay attention to Change management (process redesign)
- Contract with partners and stakeholders
- Cave health equity

Contact

FILIP DUMEZ
FILIP.DUMEZ@AZSINTBLASIUS.BE
LINKEDIN: FILIP-DUMEZ

TOM IMBERECHTS
TOM.IMBERECHTS@AZSINTBLASIUS.BE
LINKEDIN: TOM-IMBERECHTS

DR FILIP VANRYKEL
FILIP.VANRYKEL@AZSINTBLASIUS.BE
LINKEDIN: FILIP VANRYKEL

TOTeM

Integrating technology in healthcare

Case Study II

Brick & Mortar to Brick & Click

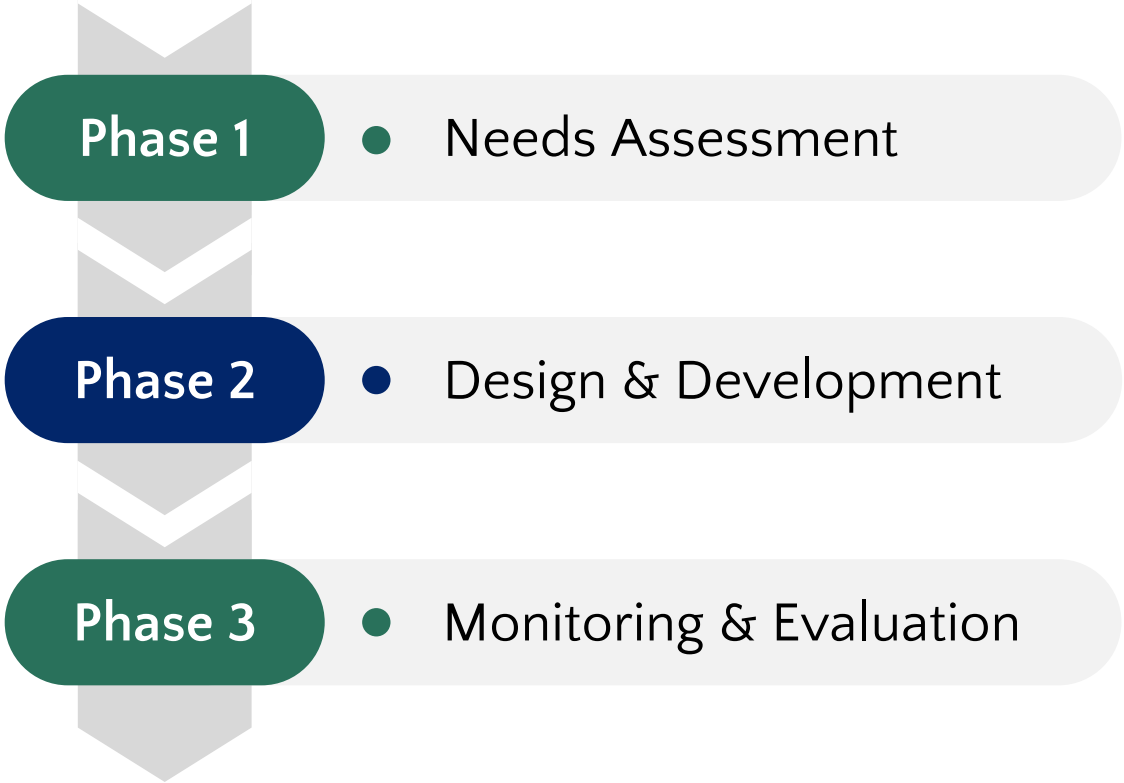
Designing and Implementing Quality, Effective and Impactful Telemedicine Programs

Prof. Dr. Saif Khairat

University of North Carolina at Chapel Hill

Center for Virtual Care Value and Excellence (ViVE)

Presentation Overview



Telehealth was essential in maintaining continuity of care during the COVID-19 pandemic, particularly in **low- and middle-income countries (LMICs)** where healthcare resources were scarce and unevenly distributed.

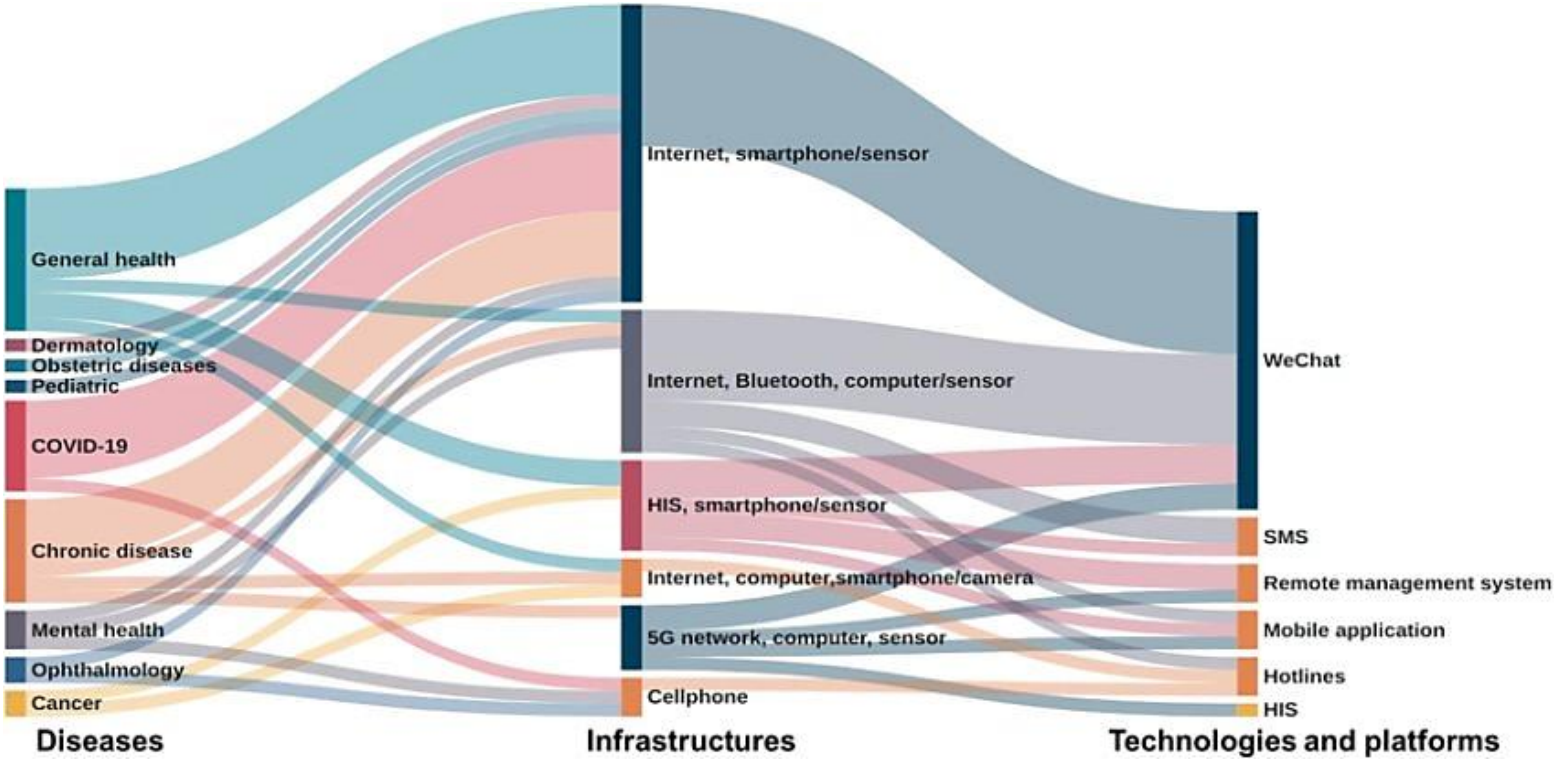


Figure 1. Sankey diagram with diseases, infrastructure, and technologies/platforms of telehealth system in China. Adapted from Ye, Jing, Lei He, and Michael Beestrum. "Implications for Implementation and Adoption of Telehealth in Developing Countries: A Systematic Review of China's Practices and Experiences." NPJ Digital Medicine, vol. 6, 2023, article no. 174. https://doi.org/10.1038/s41746-023-00908-6.

Needs Assessment

Question:

Is your organization ready to offer telehealth services?

Key Considerations:

1. Infrastructure
2. Processes
3. Outcome Metrics

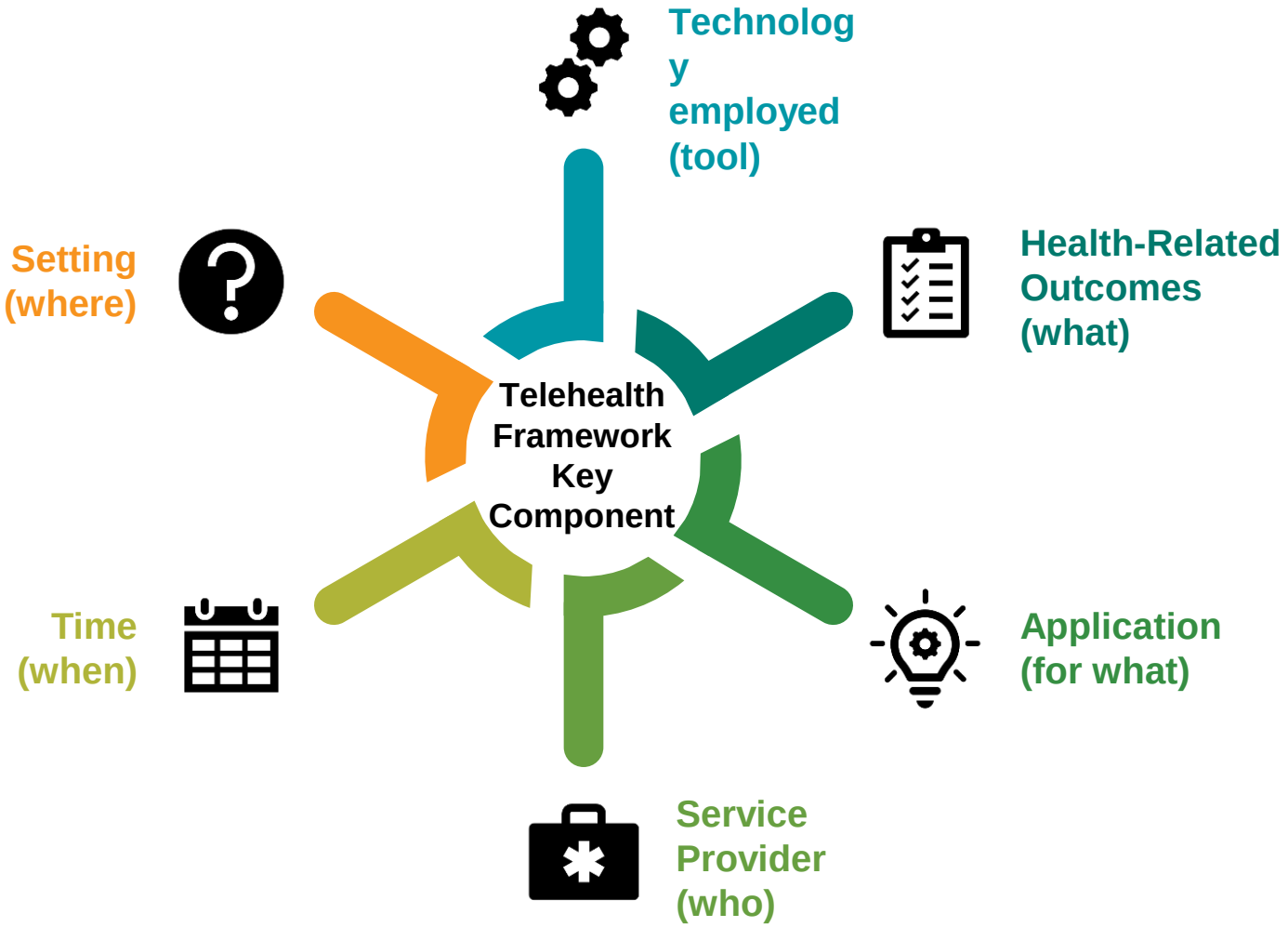
Tools / Frameworks:

NFAR-ATTC Telehealth Capacity Assessment Tool

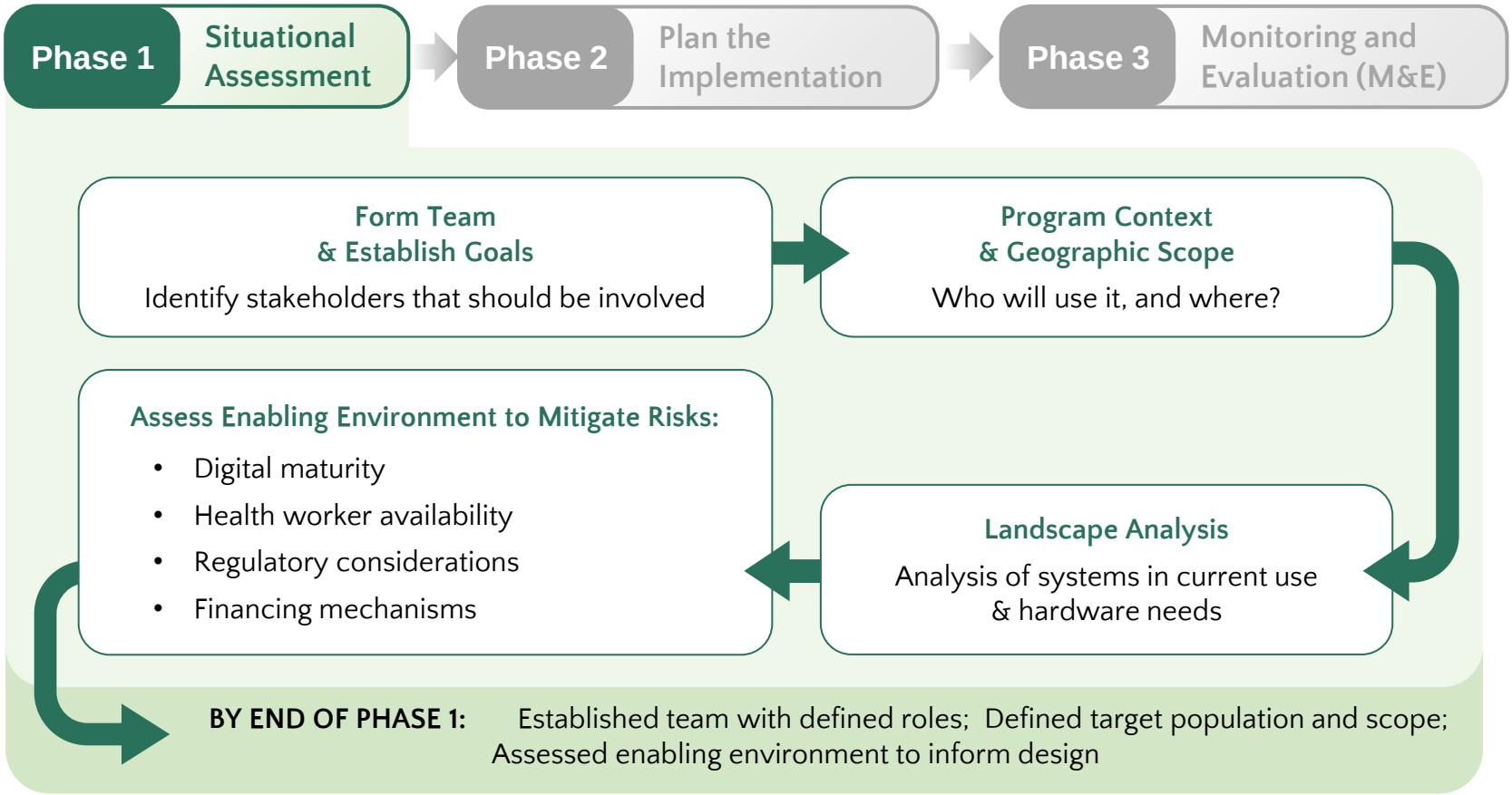
Macro level
Overarching Framework

Meso level
Community

Micro level
Individuals


Technology employed (tool)
Health-Related Outcomes (what)
Application (for what)
Service Provider (who)
Time (when)
Setting (where)
Telehealth Framework Key Component

Telehealth Implementation Phases



Design & Implementation

Question:

What is needed to prepare?

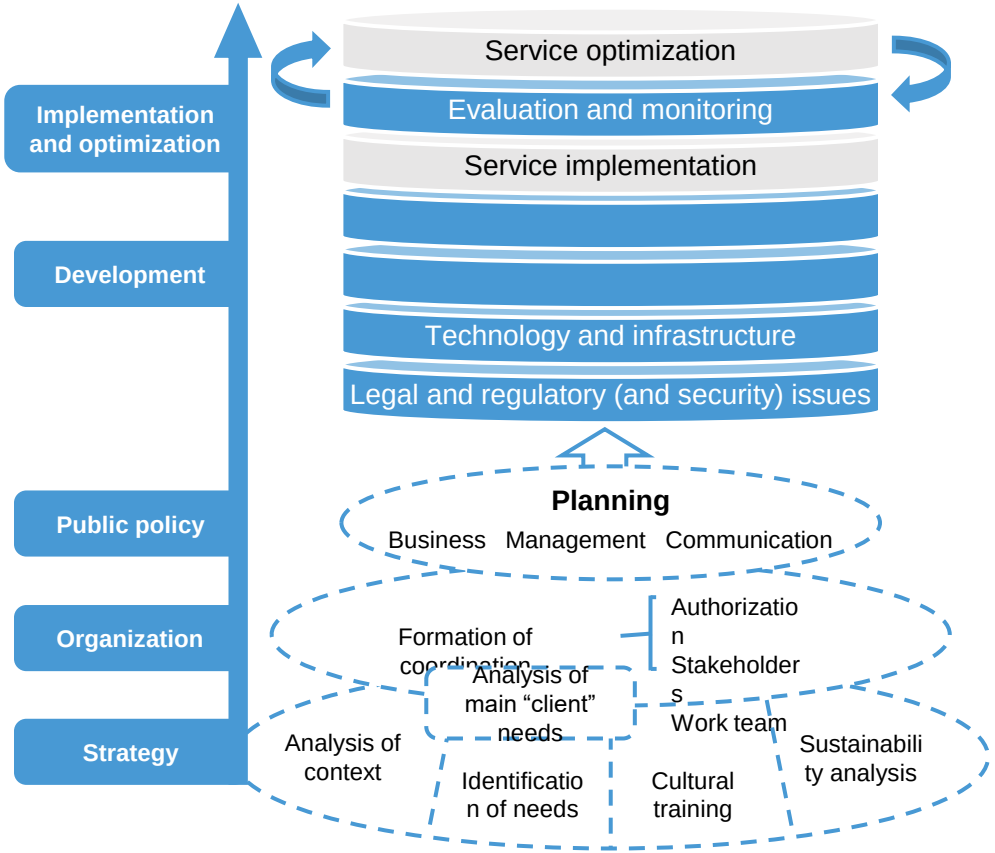
Key Considerations:

1. **Modality** (Synchronous or asynchronous)
2. **Features Needed**
3. **Specificity** (Disease-specific or not)
4. **Integration** (HIE)

Tools / Framework:

Framework for the Implementation of a Telemedicine Service
(WHO / PAHO)

Design & Implementation



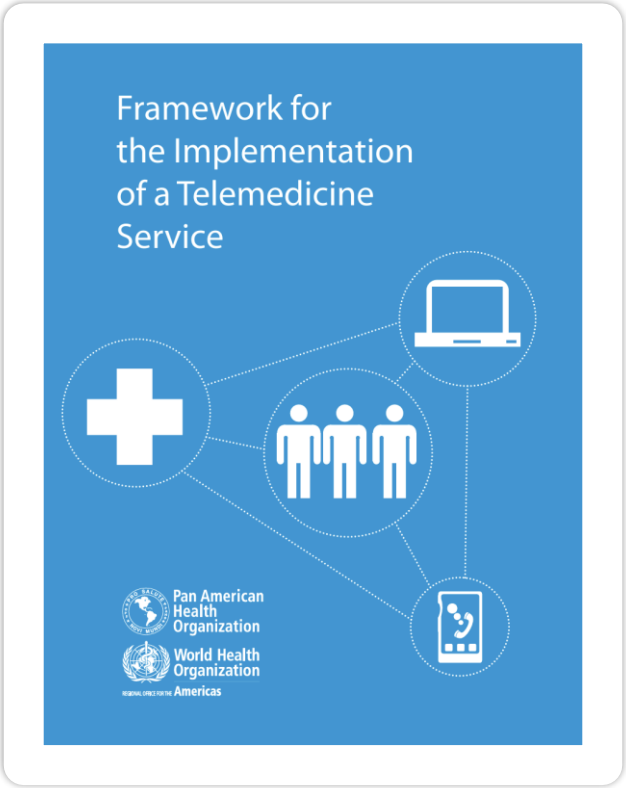


Figure 3. Telemedicine Implementation Model ("Telemedicine Hat"). Adapted from Framework for the Implementation of a Telemedicine Service. Pan American Health Organization and World Health Organization, 2016. https://iris.paho.org/bitstream/handle/10665.2/28414/9789275119037_eng.pdf. Accessed 1 Apr. 2025

Telehealth Implementation Phases

Phase 1 Situational Assessment → **Phase 2** Plan the Implementation → **Phase 3** Monitoring and Evaluation (M&E)

Telemedicine System Operation
- Define requirements
- Map workflows
- User testing
- Change management

Patient & Health Worker Safety
- Data security systems
- License verification
- Disclose audio / video recording

Establish Standard Operating Procedures:
- Clinical protocols
- Training needs
- Establish protocols

Client / Patient Engagement
- Community outreach
- Accessibility and equity

Develop a Budget
- Define overall cost
- Integration into routine health service delivery

BY END OF PHASE 2: • Defined requirements; • Mapped workflows; • Mechanisms for data privacy; • Training plan and SOPs in place; • Budget and financing plans in place

Monitoring & Evaluation

Question:

What are key performance indicators?

Key Considerations:

1. Clinical Outcomes
2. Effectiveness
3. Efficiency and Cost
4. Cost
5. Satisfaction

Tools / Frameworks:

WHO Europe Telehealth Quality of Care Assessment Tool (TQoCAT)

National Quality Forum (NQF)

Agency for Health Research and Quality (AHRQ)

Monitoring & Evaluation

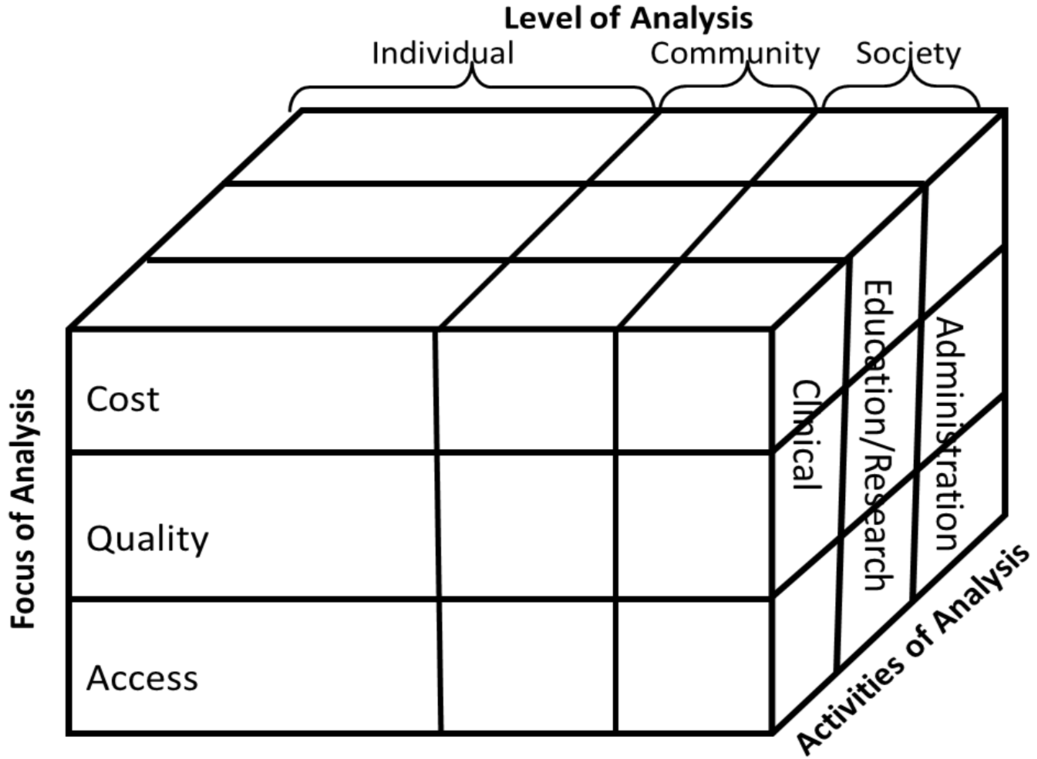
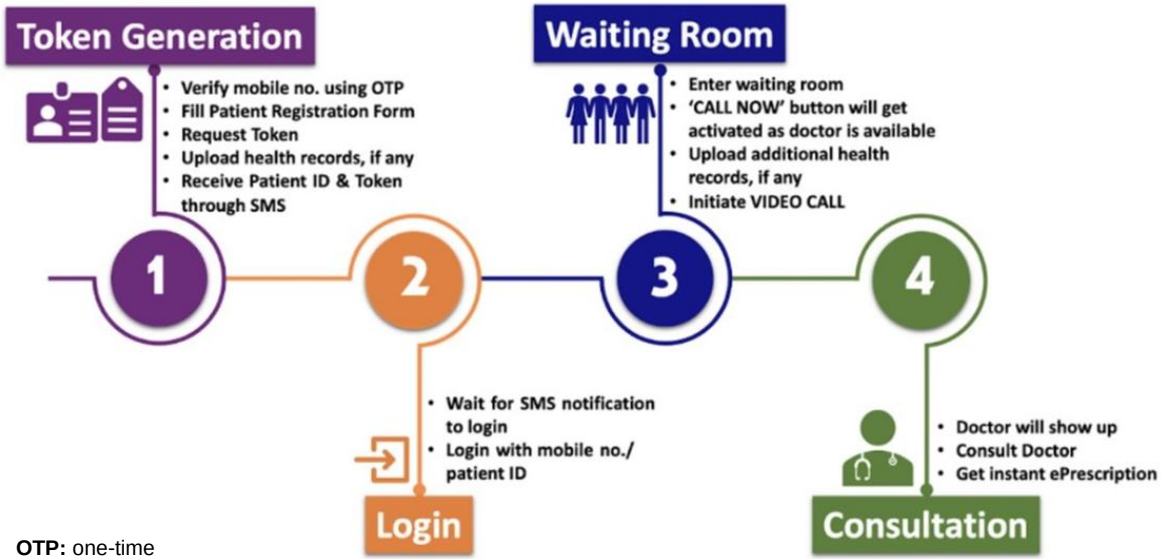


Figure 4. Comprehensive Model. Adapted from Hicks, Lanis L., and Keith E. Boles. "A comprehensive model for evaluating telemedicine." E-Health: Current Status and Future Trends. IOS Press, 2004. 3-13.

Telehealth Design & Implementation Use Case

Workflow of eSanjeevaniOPD

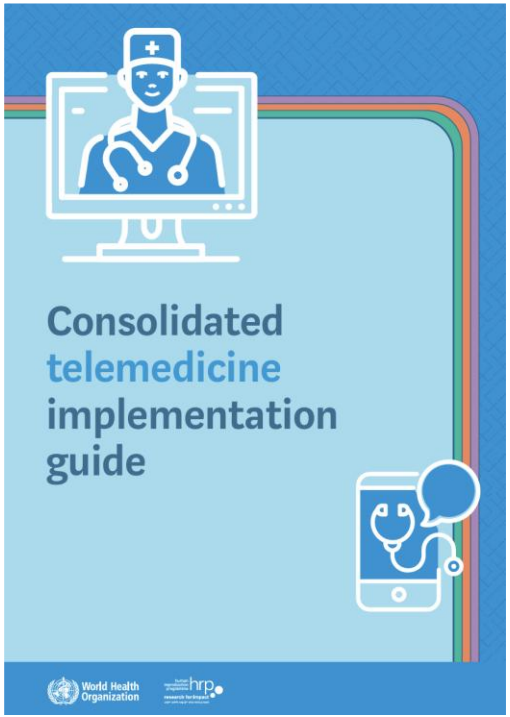


OTP: one-time password

- The processes must **mimic a hospital-based OPD**.
- The user interface must be **simple** and **intuitive**.
- The system must ensure the security of citizens' **health information**.
- **End-to-end services** from development, deployment and operationalization to capacity-building and maintenance must be provided by **one technical team**.

As of July 2022, the **National Telemedicine Service** had served over **50.5 million patients**. Of these, eSanjeevaniHWC had served over **42.3 million** across 98 571 HCWs as spokes served by over 11,000 hubs; eSanjeevaniOPD had served **8.2 million patients** (3).

Policy Implications



Box 2. *Common components for telemedicine guidelines and regulations (13)*

Although telemedicine guidelines and regulations are still emerging, they should generally contain information on the following:

+ Authority responsible for regulating telemedicine in the country.
+ When telemedicine is considered to be an appropriate standard of care.
+ Which entities would be involved in the telemedicine services and the types of health workers that can provide telemedicine-based treatment (e.g. doctors, nurses, midwives, community health workers, paramedics, therapists, counsellors, practitioners of alternative medicine).
+ Responsibility and accountability for patient outcomes.
+ Patient consent that includes an explanation of the risks, benefits and limitations of telemedicine.
+ Data privacy and security standards.
+ Technology standards for hardware, software and interoperability.
+ Training requirements and certifications.
+ Quality assurance and quality control measures.
+ Reimbursement of health services delivered via telemedicine.

Figure 7. Box 2. Common components for telemedicine guidelines and regulations. Adapted from Consolidated Telemedicine Implementation Guide. World Health Organization, 9 Nov. 2022, https://www.who.int/publications/i/item/9789240059184. Accessed 1 Apr. 2025.

Thank You!

Contact:

Dr. Saif Khairat
(saif@unc.edu)

VIVE
CENTER FOR
VIRTUAL CARE
VALUE AND EXCELLENCE

vive.unc.edu

References

Beestrum, M., Ye, J., & He, L. Implications for implementation and adoption of telehealth in developing countries: a systematic review of China's practices and experiences. npj Digital Medicine, 6, 174 (2023). https://doi.org/10.1038/s41746-023-00908-6.

Chuo, J., Macy, M. L., & Lorch, S. A. Strategies for Evaluating Telehealth. Pediatrics, 146(5), e20201781 (2020). https://doi.org/10.1542/peds.2020-1781.

Consolidated Telemedicine Implementation Guide. World Health Organization, 9 Nov. 2022, https://www.who.int/publications/i/item/9789240059184. Accessed 1 Apr. 2025.

Framework for the Implementation of a Telemedicine Service. Pan American Health Organization and World Health Organization, 2016. https://iris.paho.org/bitstream/handle/10665.2/28414/9789275119037_eng.pdf. Accessed 1 Apr. 2025.

Hicks, L. L., & Boles, K. E. A comprehensive model for evaluating telemedicine. E-Health: Current Status and Future Trends, IOS Press, 2004, pp. 3–13.

Implementation Toolkit for Accessible Telehealth Services. World Health Organization and International Telecommunication Union, 9 Sept. 2024, https://www.who.int/publications/i/item/9789240094161. Accessed 1 Apr. 2025.

Luke, M. J., Craig, S., Pak-Gorstein, S., et al. Narrowing the Digital Divide: Framework for Creating Telehealth Equity Dashboards. Interactive Journal of Medical Research, 13(1), e57435 (2024). https://doi.org/10.2196/57435.

Monitoring and Evaluating Digital Health Interventions: A Practical Guide to Conducting Research and Assessment. World Health Organization, 12 Dec. 2016, https://www.who.int/publications/i/item/9789241511766. Accessed 1 Apr. 2025.

National Quality Forum. Measures, reports, and tools. 2020. Available at: https://www.qualityforum.org/Measures_Reports_Tools.aspx. Accessed 1 Mar. 2020.

NFAR-ATTC Telehealth Capacity Assessment Tool. https://integrationacademy.ahrq.gov/resources/14616.

Otto, L., et al. The telemedicine community readiness model—successful telemedicine implementation and scale-up. Frontiers in Digital Health, 5 (2023): 1057347. https://doi.org/10.3389/fdgth.2023.1057347.

Prakash, A., et al. Building A Global Framework For Telehealth. Health Affairs Forefront, 27 June 2023. https://www.healthaffairs.org/content/forefront/6-27-prakash-piece.

Telehealth Quality of Care Tool. World Health Organization, 2024, https://iris.who.int/bitstream/handle/10665/376258/WHO-EURO-2024-9475-49247-73556-eng.pdf?

Telehealth Readiness Assessment. MHCC Telehealth Readiness Assessment, https://mhcctelehealthtool.herokuapp.com/start. Accessed 1 Apr. 2025.

Telehealth Service Implementation Model (TSIM™): A Framework for Telehealth Service Development, Implementation, and Sustainability. MUSC Health, Medical University of South Carolina, 2021, https://muschealth.org/-/sm/health/telehealth/f/tsimsummarycoedocument2021.ashx. Accessed 1 Apr. 2025.

Van Dyk, L. A Review of Telehealth Service Implementation Frameworks. International Journal of Environmental Research and Public Health, 11(2), 1279–1298 (2014). https://doi.org/10.3390/ijerph110201279. Accessed 1 Apr 2025.

Case Study III

Webinar Evaluation and Feedback

Thank You for Attending!

We greatly appreciate your participation in today's webinar. To help us improve future sessions and ensure we're meeting your needs, we would love to hear your thoughts.

Please take a few minutes to fill out our feedback form – your input is invaluable!

https://forms.gle/Ek3PvGqNzKUvVmZB6

Q&A session

Thank you for joining us !

We Appreciate Your Time and Participation!

www.intelehealth.org | neha@intelehealth.org, rishi@intelehealth.org
sindhura@intelehealth.org