WHO

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Introduction

Digital technologies are now integral to daily life, and the world's population has never been more interconnected. Over the past decade, telehealth services (in particular, telemedicine and teleradiology) have experienced significant growth. Many countries are now working to further integrate these services into their health systems as part of broader efforts to deliver efficient, people-centred care and advance universal health coverage. However, the tipping point for telemedicine adoption was the COVID-19 pandemic. During that time, numerous health professionals adopted telemedicine to provide care. However, despite these advances, scaling up telehealth into routine practice in Member States remains complex and approaches continue to vary widely. Post-pandemic uptake of telemedicine into routine care has also been uneven, raising uncertainties around its long-term viability.

Definition of Key Terms

Telemedicine - The act of delivering medical care when the patient and the physician are not physically in the same location, but instead connect through digital means—such as video consultations, online messaging, or telephone communication—for the purposes of examination, guidance, or ongoing monitoring.

Telehealth - Similar to telemedicine but includes a wider variety of remote healthcare, often involving service provided by nurses, pharmacists or social workers.

LMIC - short phrase for low- and middle-income countries.

Cross-border telehealth - refers to the provision of healthcare services across national borders using telecommunications technology.

ICD-10 codes - Shortened form for International Classification of Diseases, 10th Revision, created by the World Health Organization (WHO). This system includes clear diagnosis

documentation, standardized remote billing, data exchange across borders, quality and safety requirements.

General Overview

EFFECTS OF COVID-19 ON TELEMEDICINE

The COVID-19 pandemic served as a critical catalyst for the adoption of telemedicine by demonstrating its value as a safe, effective and scalable mode of health-care delivery. Throughout the crisis, telemedicine was instrumental in maintaining continuity of care, supporting infection control efforts, mitigating shortages of personal protective equipment, and helping to alleviate pressure on overstretched health systems. Countries such as Poland, Sweden and the United Kingdom rapidly integrated telemedicine into mainstream healthcare services to respond to these urgent needs. In the US, legal and regulatory flexibilities enabled the shift of health care services to telemedicine. The Coronavirus Aid, Relief, and Economic Security Act and the Public Health Emergency (PHE) protocols of 2020 implemented most pandemic-era policy flexibilities in the United States, including (1) relaxation of HIPAA (Health Insurance Portability and Accountability Act) compliance requirements, (2) permission to prescribe certain controlled substances via telemedicine, (3) reimbursement for telemedicine equivalent to that of in-person visits, (4) promotion of telemedicine expansion for Medicare, (5) allowances for providers to offer care across state borders regardless of licensure, and (6) new protocols and ICD-10 codes for telemedicine visits. Lawmakers made these changes to increase access to health care nationwide during the pandemic and based these flexibilities on previously considered legislative, regulatory, and policy updates. Evidence from the Organisation for Economic Co-operation and Development (OECD) strongly suggests that “countries who created provisional legislation during COVID-19 have been inclined to enhance and adopt those regulations for the deployment of telemedicine, considering administrative and financial concerns”. However, perspectives from European family doctors on the future of telemedicine still show a division between (1) those who feel more comfortable continuing with in-person care and (2) those who find telemedicine easy to conduct; the latter estimate that 20% of their future consultations will be conducted remotely.

CHALLENGES OF CROSS-BORDER MEDICAL PRACTICE

A major obstacle in cross-border telemedicine is the fragmentation of national legal frameworks. Countries maintain their own systems for medical licensing, clinical standards, and data protection, leading to inconsistencies in what is considered lawful or safe practice. A doctor legally operating in one jurisdiction may be unlicensed in another, creating uncertainty over who can provide care across borders and under what conditions. This legal diversity is further complicated by questions of liability and jurisdiction: when malpractice occurs, it is often unclear which country's courts and regulations apply, leaving both patients and providers without clear recourse.

Another significant challenge is the protection of health data, which is particularly sensitive when transmitted internationally. Differing privacy laws, most notably between regions with strict data protection frameworks, such as the European Union, and those with more permissive systems, prevent the secure flow of medical information. Inconsistent cybersecurity standards also expose patients to heightened risks of data breaches, unauthorized transfer, and misuse of medical records by foreign entities. The uneven adoption of telemedicine services further illustrates this fragmentation: although 78% of WHO European Region Member States include telehealth in their national digital strategies and 77% offer telemedicine or remote patient monitoring services, the legal and regulatory measures supporting these services vary widely and are often incomplete, with many countries lacking formal permanent frameworks.

Telemedicine's global nature also brings issues related to quality assurance and professional standards. There is no universally accepted level for remote diagnosis, tele-pharmacy, or digital monitoring tools. As a result, the quality of care a patient receives may vary depending on the origin of the service, potentially undermining trust in virtual healthcare. These disparities are exacerbated by technological inequalities, as countries differ widely in digital infrastructure, internet connectivity, and digital literacy, limiting the accessibility and reliability of telemedicine in some regions.

Economic and ethical concerns further complicate the regulatory landscape. Divergent insurance and reimbursement policies make it difficult to determine how cross-border telemedicine services should be financed and who bears the cost of care. A WHO/Europe-supported policy review found that only around 53% of countries have a defined payment or reimbursement model for telemedicine services, while just 47% have integrated telemedicine

into their national health insurance benefit packages, leaving financial frameworks unclear or absent in nearly half of the countries offering such services.

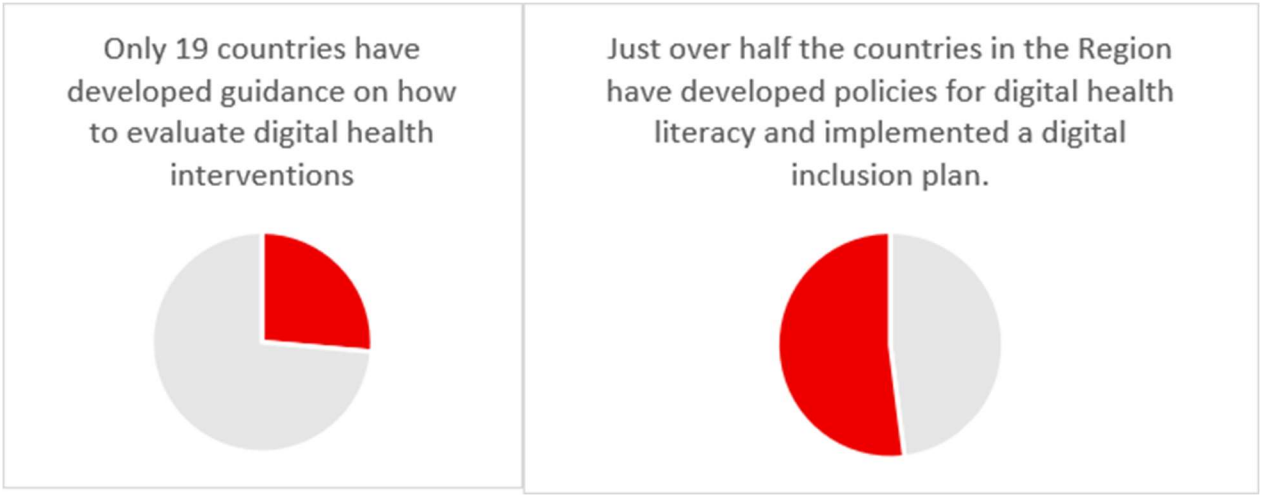
Moreover, the global telemedicine market is increasingly dominated by private corporations, whose operations often transcend national jurisdictions. This raises fears of unequal access, corporate overreach, and potential exploitation, particularly in low- and middle-income countries where regulatory capacity is limited. Issues of informed consent, cultural differences in medical ethics, and potential misuse of patient data add additional layers of complexity.

Overall, the challenges surrounding cross-border telemedicine highlight the urgent need for international cooperation and regulatory alignment. Without coordinated frameworks, telemedicine risks amplifying global health inequalities, weakening patient protections, and undermining the stability of national health systems. Addressing these challenges is therefore crucial for ensuring that digital health technologies contribute to safer, more equitable, and more effective healthcare worldwide.

TECHNOLOGY AND INFRASTRUCTURE GAPS

The adoption of digital solutions in health care has increased across the WHO European Region in recent years, changing the way patients receive care at primary care facilities, hospitals and their homes. Digital solutions are transforming the way health-care professionals diagnose and treat conditions ranging from cancer to diabetes and mental health. Now, countries need to step up investments in digital health technologies and platforms to expand access to digital health for all. A key risk is the digital health divide being created because of the uneven deployment and uptake of digital solutions. This means that millions of people region-wide are still unable to benefit from digital health technology. This inequality urgently needs to be addressed through targeted investment in technology and by building the skills and capacities of health providers so that everyone can both access and use digital health technology confidently, particularly those in low and middle income most likely to benefit. The report, Digital health in the European Region: the ongoing journey to commitment and transformation, shows that the vast majority of

countries have a national digital health strategy, however it also highlights significant gaps and areas for improvement.



The report emphasizes three top recommendations as prerequisites for countries to strengthen health systems by improving digital health solutions:

- Provide access to reliable, low-cost broadband for every household and every community.
- Ensure health data are safe and secure to help build and maintain trust in digital health tools and interventions.
- Make digital health tools, including electronic patient records, inter-operable within and between countries.

ETHICAL AND SAFETY CONCERNS

Ensuring the quality and reliability of telemedicine services remains a significant challenge. For instance, the accuracy of remote diagnosis relies heavily on patient-reported information, unlike in-person consultations where clinicians' can observe patients with diagnostic equipment, which can increase the risk of misdiagnosis. Furthermore, the rapid growth of unregulated telemedicine platforms and health applications has heightened the risk of misinformation, as some services operate without adequate medical oversight. The absence of clear quality standards and accountability mechanisms increase the likelihood of inappropriate treatment, misuse of patient data. The increasing use of artificial intelligence in diagnostic tools also raises concerns related to transparency, accountability, and bias, particularly when AI systems are trained on limited or non-representative datasets. Without clear international standards and

oversight mechanisms, these factors collectively threaten patient safety, trust, and the overall effectiveness of cross-border telemedicine services.

Major Parties Involved

United States of America: A global leader in digital health innovation with extensive telemedicine infrastructure and major companies shaping the global market. The U.S. also faces regulatory fragmentation between federal and state laws, influencing global debates on interoperability and cross-border data governance.

United Kingdom: One of the earliest adopters of national-level digital health strategies through the NHS, the government has announced plans for an “Innovator Passport” for MedTech by 2026, intended to streamline procurement and reduce repetitive local assessments. The UK actively promotes safe telehealth expansion and contributes to global regulatory discussions.

China: Analyses note rapid adoption of telemedicine in China, with thousands of internet hospitals and millions of consultations annually, but also highlight persistent legal gaps, including licensing restrictions, privacy risks, and fragmented quality controls that complicate standardized regulation and cross-border practice. National Health Commission (NHC) issued Administrative Measures for Internet-based Diagnosis, Internet Hospitals, and Good Practices for Telemedicine Services to regulate telemedicine delivery, requiring licensed providers and establishing internet hospital standards. The Supervision Rules for Internet Diagnosis and Treatment (2022) further detail requirements for internet healthcare quality, identity verification, network security, and physician accountability, including limitations on automated AI prescriptions.

Estonia: According to OECD surveys, Estonia does not yet have specific national telemedicine legislation, but telemedicine use is permitted under general healthcare laws and digital health strategies. This reflects broader EU policy frameworks where individual member states integrate telemedicine into existing systems without separate telemedicine statutes.

Sweden: Sweden permits telemedicine but has no specific telemedicine law; services fall under general healthcare laws and medical professional obligations. Providers must follow guiding principles set by the Swedish National Board of Health and Welfare for safe,

tailored remote care, ensuring follow-ups and sufficient patient data. Telemedicine adoption doubled after the COVID-19 pandemic in both public and private sectors.

Norway: Norway actively supports telemedicine as part of its national digital health strategy, with permanent regulatory changes, such as allowing e-consultations for sick notes. Telehealth, including telemedicine and telepsychiatry, is integrated into public services, although funding, infrastructure, and evaluation remain ongoing challenges.

South Korea: South Korea's Medical Service Act generally prohibits doctor-to-patient telemedicine, allowing only clinician-to-clinician communication. Telemedicine was temporarily permitted during COVID-19 and since June 2023 has operated as a pilot programme for limited follow-ups. Reforms and proposed amendments to permanently legalise telemedicine are under active debate in the National Assembly.

Bulgaria: Bulgaria does not yet have a clear, established telemedicine regime, however recent draft regulation sparked backlash for proposing telemedicine exclusively via a state platform, raising concerns about monopolies and compliance with EU internal market rules. Legal clarity on payment and implementation timelines remains lacking.

Nigeria: In Nigeria, telemedicine is permitted in practice but faces no comprehensive national legislation yet, existing health laws are fragmented and outdated. Regulatory challenges include gaps in medical liability, data privacy, and professional standards, prompting calls for dedicated telemedicine law aligned with global best practices.

India: India formally regulates telemedicine through the Telemedicine Practice Guidelines, issued by the Ministry of Health and Family Welfare. Telemedicine is legally recognised, widely implemented, and integrated into national digital health reforms, including the Ayushman Bharat Digital Mission, while requiring practitioner registration, consent, and defined prescribing limits.

South Sudan: South Sudan has no dedicated telemedicine legislation. Telemedicine activities are limited, fragmented, and largely driven by NGOs and international partners. According to WHO assessments, weak digital infrastructure, workforce shortages, and instability hinder national adoption, though telemedicine is recognised as a potential tool for improving access in remote areas.

Brazil: Brazil has a comprehensive legal framework for telemedicine under Law No. 14,150/2022 Telehealth Act, making pandemic-era measures permanent. Telemedicine is authorised

for diagnosis, treatment, and follow-ups, subject to informed consent and ethical rules. The government views telemedicine as a strategic tool for expanding access within the public health system.

Ethiopia: Ethiopia lacks a standalone telemedicine law but references telemedicine within national digital health strategies. WHO reports indicate that implementation remains largely pilot-based and donor-supported, constrained by infrastructure gaps and regulatory uncertainty. Telemedicine is viewed as a long-term solution for improving rural and specialist healthcare access.

Afghanistan: Afghanistan has no formal telemedicine regulatory framework. Telemedicine initiatives are limited, project-based, and often led by NGOs. WHO and partner organisations identify telemedicine as potentially valuable in fragile settings, but ongoing conflict, governance challenges, and lack of legal clarity prevent systematic national implementation.

Kenya: Kenya actively supports telemedicine under its Digital Health Strategy 2020–2030, though regulation remains evolving. Telemedicine is encouraged to improve healthcare access and efficiency, particularly in underserved areas. WHO and World Bank sources highlight progress alongside challenges in data protection, standardisation, and sustainable financing.

Colombia: Colombia has a well-defined telemedicine framework. Telemedicine is integrated into the national health system and permitted for diagnosis, monitoring, and follow-up care. The government promotes telemedicine to address regional inequalities and strengthen healthcare system efficiency.

Bangladesh: Bangladesh promotes telemedicine through national digital health strategies, though regulation remains partial. WHO sources describe telemedicine as expanding rapidly via public and private initiatives, especially post-COVID. Key challenges include regulatory fragmentation, data protection, and ensuring quality and equity in remote healthcare delivery.

Syria: Syria has no national telemedicine regulatory framework, with telemedicine primarily used in humanitarian and emergency contexts. WHO reports indicate that remote healthcare tools are applied to mitigate access constraints caused by conflict, but long-term integration into the national health system remains limited and informal.

Yemen: In Yemen, telemedicine is largely humanitarian-led and lacks formal regulation. WHO and UN agencies identify telemedicine as a temporary solution to health system collapse, supporting remote consultations and specialist input. However, infrastructure damage, conflict, and absence of governance prevent sustainable nationwide adoption.

Ukraine: Ukraine has integrated telemedicine into its eHealth system, supported by national reforms and WHO Europe guidance. Telemedicine expanded significantly during COVID-19 and the ongoing conflict, enabling continuity of care. The government views digital health as essential for system resilience, access, and post-war recovery.

Timeline of Events

1959 - University of Nebraska transmits neurological examinations with telehealth. This was the first recorded use of the telephone by healthcare workers to send medical documents back and forth with each other across the country.

1960s-1970s - NASA becomes a major pioneer in moving forward the research and development of telehealth.

1st January 1983 - Birth of Internet, creating universal language for different networks to connect forming the foundational network of networks, also known as the Internet.

1993 - Foundation of American Telemedicine Association. They aim to educate both patients and providers by staying up on advances in technology and care.

2010 - Centers for Medicare and Medicaid Services determines what are meaningful uses of electronic health records.

2016 - The Health Resources and Services Administration Receives Funding to Expand the Use of Telehealth in Rural Areas.

2020 - The COVID-19 pandemic spreading easily across borders leads to increased utilization of telehealth.

Previous Attempts to Solve the Issue

Telemedicine had been on a steady increase for the last decade, however the overall growth had remained slow until the appearance of COVID-19. Since then, several regulations have been introduced.

WHO/Europe has released an evidence-based support tool to help countries strengthen their telemedicine services at different levels, from individual health facilities to nationwide health systems. This includes shorter waiting times, better follow-up and management of health conditions, reduced costs, and improved accessibility of health-care services. Evolving health-care needs, emergencies, and climate-related impacts are putting significant pressure on health systems around the world. A strategic priority of WHO/Europe is to provide technical assistance and expertise to support countries in developing high-quality telemedicine services. By using the tool, stakeholders can determine their level of readiness for telemedicine service as well as monitor and evaluate it.

'Telemedicine in Action: Transforming Healthcare for LMICs' emerged from a collaborative effort between WHO and Intelehealth. This is a webinar series aiming to strengthen telemedicine as a key enabler of universal health coverage, promoting equitable and sustainable healthcare access for all. The webinar highlighted the importance of learning from diverse global experiences and applying these lessons to local contexts. It is a broader effort to support countries in adopting evidence-based digital health strategies. WHO SEARO and Intelehealth will provide participants with tools and resources, including recorded sessions and a packaged online course, to ensure the knowledge gained is both actionable and sustainable.

Possible Solutions and Approaches

To provide a solution to this problem, member states may need a multifaceted approach. Firstly, a policy will need to be developed focusing on addressing a range of enabling factors of telemedicine, including quality, safety and equity of virtual care delivery; standardization; workforce training; interoperability; gaps in the evidence base; integration with electronic health records; and the financial sustainability of operating telemedicine services. Although many are

on the same path of standardization substantial progress has yet to be achieved, continued, concerted efforts are required to move forward.

This approach involves carefully assessing the disparities of infrastructure and resources among U.N. member states, and ensuring that targeted support and essential infrastructural supplies are provided to those countries most in need to promote equitable access and capacity-building.

Effecting financing and repayment models that encompass all health services suitable for virtual delivery are key to the successful scale-up of telemedicine. These should be guided by a value-based assessment framework that facilitates performance monitoring and ongoing quality improvement.

A key enabler for adoption is having clinical guidelines for telemedicine. Standardized guidelines ensure safe, effective and consistent telemedicine practices across different clinical contexts.

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