# The policy dimensions, regulatory landscape, and market characteristics of teledermatology in the United States

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The COVID-19 pandemic has spurred healthcare systems across the world to rapidly redesign their models of care delivery. As such, this pandemic has accelerated the adoption of teledermatology in the United States. However, it remains unknown whether this momentum will be maintained after the pandemic. The future of teledermatology in the United States will be significantly influenced by a complex set of policy, legal, and regulatory frameworks. An understanding of these frameworks will help dermatologists more effectively adopt and implement teledermatology platforms. In this article, we review the current state of teledermatology in the United States, including policy dimensions, the regulatory landscape, market characteristics, and future directions. (JAAD Int 2020;1:202-7.)

***Key words:*** COVID-19; digital health; health policy; teledermatology.

## INTRODUCTION

The COVID-19 pandemic has spurred healthcare systems across the world to rapidly redesign their models of care delivery. In order to comply with social distancing efforts, medical practices have accelerated their adoption of telehealth models. Early reports suggest that some practices have increased their proportion of telemedicine visits from 10% before the pandemic to more than 90% during the pandemic.[1] Medicare, the largest public payer in the United States, reported that over 9 million beneficiaries received telehealth services from mid-March through mid-June 2020.[2] Even before the pandemic, dermatologists in the United States had been at the forefront of implementing telemedicine, with 15% of dermatologists reporting the regular use of telemedicine in 2016.[3]

In the United States, there are wide geographic disparities in access to expert dermatologic care.[4] A nationwide study of the geographic distribution of dermatologists found that there are 4.03 dermatologists per 100,000 residents in metropolitan areas, while there are only 3.06 dermatologists per 100,000 residents in rural areas.[5] In addition, the United States has an aging population with an increasing incidence of dermatologic diseases.[6,7] Therefore, teledermatology (TD) can potentially improve access to expert dermatologic care.

The earliest descriptions of TD in the United States date back to at least 1972, when dermatologists at Massachusetts General Hospital used a black-and-white television system to remotely diagnose patients at an airport medical station.[8] Since then, dramatic advancements in telecommunications, internet connectivity, and information storage have spurred rapid growth in the utilization of TD services. Recent studies have demonstrated that TD services achieve diagnostic accuracy and clinical outcomes comparable to in-person dermatologic consultations.[9,10] Furthermore, recent evaluations of TD programs targeted at low income populations showed that TD improved access to dermatologic care without increasing the volume of total dermatologic visits.[11-13] This suggests that increased adoption of TD has the potential to increase the efficiency of case triage.

In this article, we review the current state of TD in the United States, including policy dimensions, the

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regulatory landscape, market characteristics, and future directions. We describe the TD platforms at the Veterans Health Administration (VHA) and Mayo Clinic to highlight two institutions with long-standing TD programs in the United States.

## POLICY DIMENSIONS AND REGULATORY FRAMEWORKS

**CAPSULE SUMMARY**

- The future of teledermatology in the United States will be significantly influenced by a complex set of policy, legal, and regulatory frameworks.
- An understanding of these domains will help dermatologists more effectively adopt and implement teledermatology platforms.

In the United States, health care facilities are composed of a combination of nonprofit, government-owned, and for profit organizations. Healthcare coverage is administered through a mixture of private health insurance and public health coverage. Individuals under the age of 65 years are primarily insured through private health insurance provided by employers. However, Americans aged 65 years and older, primarily receive health insurance through Medicare, a public national health insurance program. Medicaid is a public program administered on the state level that provides health insurance coverage to low income individuals. Veterans of the United States military receive healthcare through the federally administered VHA.[14] Table I summarizes these payers and their respective TD coverage.

A 2016 national survey identified 102 active TD programs in the United States, a nearly 3-fold increase from the 37 active programs in 2011. The study found that 62 out of 102 active TD programs were governmental programs associated with the VHA. Of the active, nongovernmental TD programs in the United States, 50% were established in academic institutions, 30% were in private practice, 10% were in medical groups, and the remaining 10% were on virtual office platforms. Virtual office platforms provide direct care to patients and do not require a primary care referral. There are two primary modalities of TD: store-and-forward and live-interactive. Store-and-forward is the most popular TD modality, and accounted for 72% of TD encounters in the United States as of 2018.[15] Store-and-forward is an asynchronous process in which images and health data are transmitted to a clinician for later review. On the other hand, live-interactive is a synchronous process in which the patient and clinician interact in real-time using video conferencing.

Since individual states maintain autonomy over the governance of private payers and Medicaid, there are wide variations in the legal and regulatory frameworks of TD across states.[16,17] For example, dermatologists face uncertainty surrounding the medical liability and malpractice risk while practicing TD across state lines.[18] In addition, TD can pose risks to patient privacy and security.[19] Dermatologists must ensure that the capture, transmission, and storage of clinical images complies with the federal Health Insurance Portability and Accountability Act statutes along with state specific regulations. The federal government has yet to develop a comprehensive regulatory framework for telemedicine, and this ambiguity may have deterred a wider spread adoption of TD.[11] However, in response to COVID-19, the Department of Health and Human Services issued a decree stating it will not enforce The Health Insurance Portability and Accountability Act statutes on clinicians providing telehealth in good faith during the pandemic.[20] This has fostered clinicians' comfort in utilizing platforms, such as FaceTime and WhatsApp, to conduct TD visits, even though these platforms are not Health Insurance Portability and Accountability Act-compliant. Additionally, in most states, dermatologists are only allowed to practice TD in the state in which they are licensed. In effect, this limits the ability of dermatologists to practice TD across state lines.[21]

Prior to the COVID-19 outbreak, laws governing reimbursement varied significantly across state lines. All state Medicaid programs provided coverage for live-interactive sessions, yet only 11 states reimbursed store-and-forward services. In terms of private payers, 36 states had passed parity laws requiring private insurers to provide the same coverage for telemedicine services as in-person care.[21] Out of all major payers, Medicare has historically had the most restrictive regulations for the coverage of TD. Prior to 2019, Medicare only covered live-interactive sessions. In 2019, Medicare expanded the coverage to include virtual patient check-ins, as well as store-and-forward services.[11,22] Medicare virtual patient check-ins allow patients to communicate with their doctors through telephone calls, text messages, email, or patient portals. These check-ins must be initiated by the patient and are only covered if the patient has an established relationship with the provider. Yet these policy changes did not induce broader adoption of TD in the Medicare population due to their relatively low

*Abbreviations used:*

DTC: direct-to-consumer
TD: teledermatology
VHA: Veterans Health Administration

reimbursement rates. Virtual patient check-ins are reimbursed at approximately $15, and store-and-forward services are reimbursed at approximately $13.[22] For comparison, Medicare reimbursement rates for in-person office visits with established patients range from $22 to $148 based on the level of complexity.[23]

During the COVID-19 pandemic, state Medicaid programs, private payers, and Medicare all issued temporary waivers that provided payment parity between telehealth and in clinic care.[24] However, it remains unclear whether payment parity will be sustained after the pandemic. Table II summarizes the regulatory changes related to the COVID-19 pandemic.

In the United States, payers primarily reimburse dermatologists in a fee-for-service manner. Fee-for-service payment models create incentives that may hinder wider adoption of TD. Currently, dermatologists receive higher reimbursement from procedures than from consultation; thus, dermatologists may prefer in-person visits that result in procedures over TD consultations.[25] Yet, as the United States healthcare system transitions away from fee-for-service toward more integrated, quality based reimbursement models, dermatologists may be incentivized to increase the adoption of TD.

## THE VETERANS HEALTH ADMINISTRATION EXPERIENCE

VHA can be broadly described as a veteran specific nationalized health service, more akin to single payer systems, such as the National Health Service in the United Kingdom. The VHA is the nation's largest integrated system that serves the nation's more than 18 million veterans. The VHA operates under a congressionally appropriated global budget; therefore, providers are not incentivized by fee-for-service reimbursement. As a unified, government-run system, the VHA has developed one of the nation's most extensive and prominent TD networks.[26]

Originally designed to improve access for rural veterans, the VHA TD network now includes 62 participating facilities, and it had more than 101,000 store-and-forward TD encounters in 2016.[15] Of these encounters, 71% were completed within 7 days of referral. This is a significantly shorter turnaround time in comparison to the average waiting period of 36 days for a dermatology patient to see a dermatologist in person in the United States.[27] A 2013 randomized controlled trial demonstrated that the VHA store-and-forward TD program achieved equivalent clinical outcomes in comparison to conventional, in-person consultations.[28] In addition, a 2015 study found that, from a societal economic perspective, the VHA TD program was more cost efficient than the conventional referral process.[29] On an institutional level, the VHA has achieved efficiency by developing standardized templates and operational manuals for providers, imagers, and TD readers. In addition, the VHA has developed a rigorous training program for resident physicians to acquire skills in TD imaging.[30]

## THE MAYO CLINIC EXPERIENCE

Mayo Clinic is a tertiary care academic medical center with locations in Rochester, Minnesota; Phoenix/Scottsdale, Arizona; and Jacksonville, Florida. Mayo Clinic is one of the pioneering institutions of both telemedicine and TD in the United States. In 1986, Mayo Clinic linked its 3 campuses in Minnesota, Arizona, and Florida by means of a 2-way satellite program to support physicians in remote clinics.[31] In 1996, Mayo Clinic developed a telemedicine system that connected its 3 campuses to the King Hussein Medical Center and Amman Surgical Hospital in Amman, Jordan.[32] In 1997, Mayo Clinic established one of the nation's first store-and-forward TD programs. This initial platform was shown to have an 81% concordance with face-to-face office visits.[33] Since then, Mayo Clinic has expanded its TD presence and recently established a local TD network for uninsured and underinsured populations.[34] Mayo Clinic built a mobile phone-based store-and-forward TD service that integrates data from external community clinics into Mayo Clinic's electronic health record. In addition, Mayo Clinic implemented a streamlined process that utilized standardized intake templates for TD consultations. By providing standardized, relevant clinical information, Mayo Clinic's TD program improved management concordance by 117% while reducing face-to-face referrals by 15.1%.[35]

Moreover, the collection of standardized clinical information from TD consultations is part of a broader effort to collect, organize, and aggregate health data. To this end, Mayo Clinic developed a convolutional neural network model to automatically classify and organize dermatology images stored within the institution's electronic health records.[36] This enables researchers to quickly assemble a cohort of specific image types for

**Table I.** Summary of payers and teledermatology coverage in the United States

| | Medicare | Medicaid | Veterans Health Administration | Private insurance |
|---|---|---|---|---|
| Patient demographics | Adults age 65+ years and certain residents with disabilities | Low income adults and children | Members of the military | Primarily employer-sponsored insurance for employees and their families. Individuals can purchase private insurance on marketplace |
| Government funded | Federal program | Funded by both federal and state governments | Federal program | Subsidized by federal government through tax incentives |
| % of US population | 15% | 18% | 3% | 55% |
| Teledermatology coverage | Primarily live-interactive. Store-and-forward and virtual check-ins also covered but at lower reimbursement rates | Varies by state. All states cover live-interactive. 11 states cover store-and-forward | Primarily store-and-forward with live-interactive as well | Varies by insurance company and state. Most cover store-and-forward as well as live-interactive |

**Table II.** Regulatory changes related to COVID-19

| | Regulatory change | Effect |
|---|---|---|
| Payment | Payment parity between telehealth and in clinic care | Improved the financial viability of telehealth for clinicians and increased adoption of telehealth |
| Privacy | Penalties for HIPAA violations that occur in good faith will not be imposed by the Department of Health and Human Services | Allowed clinicians to use platforms that are not HIPAA compliant such FaceTime and WhatsApp |
| Licensing | Some states relaxed or eliminated interstate licensure requirements | Enabled clinicians from out-of-state to practice via telehealth |

*HIPAA*, Health insurance portability and accountability act.

research, rather than manually sifting through individual patient encounters. On an institutional level, Mayo Clinic has prioritized advanced data analytics by developing an enterprise-wide Clinical Data Analytics platform. This platform will utilize Mayo Clinic's extensive de-identified clinical and molecular data to build novel artificial intelligence and machine learning models.[37]

## FUTURE DIRECTIONS

Recently, artificial intelligence has made dramatic progress in its applications for image analysis in dermatology.[38-42] The improving performance of artificial intelligence models, therefore, can potentially be applied to improve TD processes. Though existing TD platforms can connect patients and referring physicians to dermatologists across geographic distances, these processes are still relatively time- and labor-intensive for dermatologists. Dermatologists must still spend time manually triaging patients for in-person care. However, a smartphone app can use convolutional neural networks to broadly classify images of skin lesions, and primary care physicians in underserved settings could use such an app to automatically, digitally triage high-risk patients. The benefits of this type of app are 2-fold: 1) patients with serious conditions, such as skin cancers, could receive earlier diagnosis and prevent progression, and 2) patients who do not require dermatologic consultation can receive reassurance and avoid unnecessary treatment and procedures.

In addition, the market reach of direct-to-consumer (DTC) TD platforms has grown rapidly in recent years. DTC TD services often take the forms of websites and mobile applications. These platforms allow patients to obtain dermatologic consultations and prescription medications without any prior physician–patient relationship. The providers must be licensed in the state where the patient lives.

A 2018 study identified 29 DTC TD services in the United States.[43] Most DTC TD services offer patient consultations within 48 hours. Majority of DTC TD services do not accept health insurance and charge a fee for consultation. The median consultation fee is USD $59.[44] This is comparable to the average office-visit copay of USD $36 paid by patients with private insurance for an in-network consultation.[45] Therefore, these services offer the potential to increase patient convenience and improve access to care. However, these services remain poorly regulated and raise important patient safety concerns. A 2016 study showed that DTC TD services frequently did not provide a patient with the choice of clinician or transparent clinician credentials and proffered diagnoses without adequate medical history-taking.[46] In addition, numerous DTC smartphone apps have recently been developed to detect lesions that are suspicious for melanoma. However, a 2018 Cochrane systematic review noted high rates of false negatives and wide variability in accuracy, with sensitivities ranging from 7% to 73% and specificities ranging from 37% to 94%.[47,48] As such, none of these apps have achieved United States Food and Drug Administration approval and must demonstrate significant improvements in accuracy before being adopted into clinical practice.

Similarly, legal and regulatory frameworks will have significant implications on the future of TD in the United States. During the COVID-19 pandemic, policymakers incentivized the adoption of TD by providing payment parity. However, moving forward, it remains unclear whether these temporary waivers will be formalized into more permanent statutes. Payment parity incentivizes the increased utilization of TD and has potential to improve access for underserved patient populations. However, it is not known whether this is financially viable for payers. TD visits are typically shorter than office visits and have lower underlying costs than office visits. Therefore, from the payer's perspective, payment parity may result in relative overpayment for TD services. Yet, from the physician's perspective, it will be financially challenging to continue providing TD without payment parity. Taken together, policy makers will have to develop TD reimbursement models that promote access while containing costs.

To the same end, the adoption of TD has been limited by state licensure requirements, which impose significant compliance burdens on physicians practicing across state lines. Policymakers could reduce this burden by providing a federal telehealth practitioner licensing pathway that would enable physicians to more easily practice TD across state lines.[49]

## CONCLUSIONS

In summary, dermatologists in the United States have a long history of providing care through TD models. The COVID-19 pandemic has accelerated the adoption of TD in the United States; however, it remains unknown whether this momentum will be maintained. In order to maintain this momentum, dermatologists and policymakers should collaborate to develop TD policies and regulations that incentivize improved access, outcomes, and patient experience. The United States healthcare system consists of a broad spectrum of patient populations, payers, reimbursement models, and regulatory frameworks in both the public and private sectors. Therefore, the successes and failures of the United States TD experience can be used internationally to better inform TD policymaking. To the same end, policymakers in the United States would be served well by gleaning insights from international health systems and their TD models.

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