Intention to Sustain Telemedicine Delivery During the COVID-19 Pandemic Among US Office-Based Physicians: Evidence from the 2021 National Electronic Health Records Survey

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BACKGROUND
The COVID-19 pandemic required clinicians to rapidly adopt telemedicine. Less is known about whether clinicians plan to sustain telemedicine delivery. While many incentives were put in place to support adoption (e.g., reimbursement parity), barriers (e.g., patients’ comfort with technology) were encountered that may hinder sustainability in some healthcare settings. Few studies have examined the association between barriers and facilitators to using telemedicine and physicians’ intentions to sustain telemedicine delivery.

To address this gap, this study aimed to estimate the prevalence of the intent to sustain telemedicine delivery after the pandemic using national-level data. Findings may inform policymakers and healthcare organizations who are evaluating whether to continue telemedicine use after the pandemic ends.

METHODS
We used 2021 data from the annual National Electronic Health Records Survey, which assesses EHR adoption and use patterns across US office-based physicians. In 2021, the survey began assessing telemedicine use. We restricted the sample to respondents who reported offering telemedicine to patients based on the question “Does your practice use telemedicine technology (e.g., audio, audio with video, web videoconference) for patient visits?” Telemedicine options included audio-only, videoconferencing, and other (e.g., asynchronous electronic visits, secure messaging). We also excluded respondents who reported no telemedicine use during the pandemic through the question “Since March 2020, what percentage of your patient visits were through telemedicine technology?” Intent to sustain telemedicine delivery was measured through the question “Do you plan to continue using telemedicine visits (in addition to in-person visits) when appropriate once the coronavirus disease (COVID-19) pandemic is over?”

We examined the sample’s characteristics by intention to continue use of telemedicine using descriptive statistics. The unweighted sample consisted of 1266 physicians (representing 277,480 physicians). We used multivariable logistic regression models to control for potential confounders (e.g., characteristics of physicians, practices, and telemedicine platforms). Complete case analysis was used to address missing data. We used Stata 17.0 (StataCorp, College Station, TX) for all analyses.

RESULTS
Most (83.0%) physicians reported intent to sustain telemedicine delivery (Table 1). When controlling for other factors, physicians who reported that the telemedicine platform was not usable or did not meet their needs (OR = 0.40, 95% CI: 0.22–0.72) or that telemedicine was not appropriate for their specialty or patients (OR = 0.29, 95% CI: 0.17–0.51) had lower odds of reporting intentions to sustain telemedicine delivery. Inversely, physicians who reported improved reimbursement and relaxed rules on telemedicine use (OR = 3.11, 95% CI: 1.57–6.14) had higher odds of reporting intentions to sustain telemedicine delivery. All models suggested that physicians who did audio-only visits or had both audio-only and video telemedicine visits had higher odds of reporting intentions to sustain telemedicine delivery compared with physicians who reported using neither audio-only nor video telemedicine (Table 2).

DISCUSSION
We identified several telemedicine-level factors (poor telemedicine usability, unsuitability of telemedicine for certain patients, audio-only capabilities) that may influence physicians’ intentions to sustain telemedicine delivery. As the US faces policy hurdles with making relaxed restrictions on telemedicine use permanent for post-pandemic telemedicine practice, commentaries suggest that certain types of patients (e.g., new visits, suspected cancer tumor) should be managed...
through in-person care. There is a need for further research to identify patient characteristics and clinical conditions that can be effectively managed through telemedicine, which could help guide de-implementation initiatives for physicians who only see high-risk patients and develop risk stratification models for healthcare organizations to use to determine which patients can supplement in-person care with telemedicine visits. There is also a need to assess and improve the usability of telemedicine modalities (e.g., audio-only visits) among clinicians and patients.

This study’s limitations included limited information on how often respondents encountered each studied barrier and patient case-mix. Furthermore, the decision to sustain telemedicine delivery may not always be at clinicians’ discretion. This survey was also administered to US office-based physicians, precluding generalizations outside of these settings.

Table 1 Sample Characteristics (Weighted, $n = 277,480$)

| Characteristic | Intent to sustain telemedicine $n$ (weighted col %) | No intent to discontinue use $n$ (weighted col %) | $p$-value |
|---------------|----------------------------------------------------|-------------------------------------------------|-----------|
| **Physician age** |                                                   |                                                 |           |
| 50 years or older | 145,738 (63.3%) | 35,618 (75.6%) | 0.043     |
| Under 50 years | 84,637 (36.7%) | 11,487 (24.4%) |           |
| **Physician sex** |                                                   |                                                 |           |
| Male | 149,718 (65.0%) | 36,384 (77.2%) | 0.028     |
| Female | 80,657 (35.0%) | 10,721 (22.8%) |           |
| **Physician specialty** | | | <0.001 |
| Primary care | 120,045 (52.1%) | 12,721 (27.0%) |           |
| Surgical | 40,062 (17.4%) | 13,464 (28.6%) |           |
| Medical | 70,268 (30.5%) | 20,920 (44.4%) |           |
| **Number of practice locations** | | | 0.616 |
| One | 173,654 (75.4%) | 33,324 (70.7%) |           |
| Two | 40,750 (17.7%) | 9909 (21.0%) |           |
| Three or more | 15,971 (6.9%) | 3,872 (8.2%) |           |
| **Number of physicians** | | | 0.210 |
| One | 52,503 (22.8%) | 12,515 (26.6%) |           |
| Two to three | 35,748 (15.5%) | 10,921 (23.2%) |           |
| Four to ten | 71,351 (31.0%) | 12,946 (27.5%) |           |
| Eleven or more | 70,773 (30.7%) | 10,723 (22.8%) |           |
| **Practice ownership** | | | 0.119 |
| Physician-owned | 125,632 (54.5%) | 30,038 (63.8%) |           |
| Not physician-owned | 104,743 (45.5%) | 17,067 (36.2%) |           |
| **Accepts Medicare** | | | 0.271 |
| Yes | 191,316 (83.0%) | 41,815 (88.8%) |           |
| No | 39,059 (17.0%) | 5,290 (11.2%) |           |
| **Accepts Medicaid** | | | 0.280 |
| Yes | 184,472 (80.1%) | 34,738 (73.7%) |           |
| No | 45,903 (19.9%) | 12,367 (26.3%) |           |
| **Percentage of patient visits through telemedicine** | | | 0.022 |
| Less than 25% | 113,152 (49.1%) | 31,051 (65.9%) |           |
| 25 to 49% | 68,824 (29.9%) | 12,174 (25.8%) |           |
| 50% or more | 48,399 (21.0%) | 3,880 (8.2%) |           |
| **Telemedicine type** | | | <0.001 |
| Neither audio-only or video telemedicine (e.g., e-visits, secure messaging) | 38,191 (16.6%) | 13,259 (28.1%) |           |
| Audio-only | 65,485 (28.4%) | 8,972 (19.0%) |           |
| Video telemedicine | 28,113 (12.2%) | 11,641 (24.7%) |           |
| Both audio-only and video telemedicine | 98,586 (42.8%) | 13,233 (28.1%) |           |
| **Facilitators/barriers experienced** | | |           |
| Limited internet access in health care organization | 81,618 (35.4%) | 9,679 (20.5%) | 0.002 |
| Telemedicine platform not usable or did not meet organization’s needs | 33,554 (14.6%) | 11,415 (24.2%) | 0.020 |
| Telemedicine not appropriate for physician’s specialty or type of patients | 46,318 (20.1%) | 22,817 (48.4%) | <0.001 |
| Improved reimbursement and relaxed rules on telemedicine use | 106,308 (46.1%) | 8,932 (19.0%) | <0.001 |
| Limitations in patients’ access to technology | 150,070 (65.1%) | 28,810 (61.2%) | 0.497 |
| Patients’ difficulty using technology/telemedicine platform | 160,035 (69.8%) | 31,646 (67.2%) | 0.611 |

*Primary care specialties included adolescent medicine, family medicine, geriatric medicine, general practice, hospital medicine, palliative medicine, internal medicine, obstetrics and gynecology, and general pediatrics.

*Medical specialties included cardiology, dermatology, psychiatry, neurology, allergy, critical care, genetics, immunology, emergency medicine, endocrinology, gastroenterology, hematology, oncology, hepatology, hospice, infectious disease, nephrology, physical medicine and rehabilitation, pain medicine, and vascular medicine.
Nonetheless, this study identified telemedicine-related factors associated with intent to continue telemedicine, suggesting areas for further interventions to optimize telemedicine implementation or de-implementation and delivery after the pandemic ends.

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