Are state telemedicine parity laws associated with greater use of telemedicine in the emergency department?

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Abstract

Background: Telemedicine is a valuable tool to improve access to specialty care in emergency departments (EDs), and states have passed telemedicine parity laws requiring insurers to reimburse for telemedicine visits. Our objective was to determine if there is an association between such laws and the use of telemedicine in an ED.

Methods: As part of the 2016 and 2017 National ED Inventory–USA surveys, directors of all 5404 EDs in the United States were surveyed on the use of telemedicine. States were divided into those with any form of telemedicine parity law and those without (as of January 2016). We investigated the association between a telemedicine parity law and the use of telemedicine controlling for ED characteristics; state was included as a random intercept.

Results: In 2016, among the 50 states and the District of Columbia (DC), 21 (41%) had a telemedicine parity law, whereas 30 (59%) did not. Among the 4418 ED respondents to the telemedicine question (82% response rate), 2352 (53%) received telemedicine. The proportion of EDs receiving telemedicine varied widely across the states and DC, ranging from 13% in DC to 89% in Maine. Neither the presence nor duration of state telemedicine parity laws were independently associated with ED receipt of telemedicine in 2016 nor the adoption of telemedicine from 2016 to 2017.

Conclusion: Telemedicine parity laws were not associated with use of telemedicine in the ED. These results suggest that other factors are driving the wide variation in ED use of telemedicine across states.

KEYWORDS
emergency department, healthcare policy, payment policy, reimbursement, telehealth, telemedicine
INTRODUCTION

Patients in remote or rural locations often have limited access to specialty care, and telemedicine is increasingly used in emergency departments (EDs) to bridge this gap. In an effort to increase telemedicine use, many states have passed telemedicine payment parity laws that typically mandate reimbursement of telemedicine visits at a level equivalent to in-person visits. In the setting of the ongoing coronavirus disease 2019 pandemic, temporary loosening in reimbursement policy and regulations have been accompanied by anecdotal reports of dramatic changes in the use of telemedicine by EDs in rural and urban environments. However, it is not clear whether these changes will persist and whether payment policy may play a role.

Previous work on hospitals’ use of telemedicine found that hospitals in states with payment parity by private insurers were more likely to adopt telemedicine. Likewise, greater outpatient tele-mental health use is associated with the state’s regulatory environment and payment parity laws, although overall use in the Medicare program has not been associated with parity laws. However, similar work has not been done on telemedicine use among EDs.

It is less clear how payment policy will affect use of telemedicine in EDs. Given the upfront investment required, the cost of the technology, and the important role of cost in influencing EDs’ decisions to adopt telemedicine technology, the financial implications of states’ varying policies may be critical. However, many EDs use telemedicine for the treatment of stroke care without reimbursement, so it is also possible that reimbursement policy does not play a role. Our objective was to determine whether there is an association between state telemedicine parity laws and the use of telemedicine among EDs.

METHODS

STUDY DESIGN, SETTING, AND PARTICIPANTS

As part of the 2016 National ED Inventory (NEDI)–USA survey (Supplemental Figure A1), we surveyed all 5404 US EDs that were open in 2016. We included all responding EDs with a complete response to the question about receipt of telemedicine. We also used data from the 2017 NEDI-USA national survey to determine ED telemedicine receipt in the subsequent year. These surveys were approved by the Partners Healthcare institutional review board and were coordinated by the Emergency Medicine Network at Massachusetts General Hospital (Boston, MA). Detailed survey methods have been previously reported.

We also used data from the Center for Connected Health Policy cross-referenced with the American Telemedicine Association 2016 Gap Analysis to identify states’ policy environments with respect to telemedicine. Data were based on state policy in 2016.

The Bottom Line

A total of 21 states have passed parity laws regarding reimbursement for essential telemedicine services, which provide specialty care in multiple emergency departments (EDs). National 2016 and 2017 surveys of 4418 EDs found that 2352 (53%) received telemedicine services, but this was not associated with the presence nor duration of state telemedicine parity laws.

2.2 Survey administration

The surveys were composed largely of questions that have been used in prior studies and were completed on paper, by Web, or by telephone. Volunteer state coordinators helped to maximize survey participation and obtain responses from as many EDs as possible in their respective states (Supplemental Table A1). Survey data were entered and managed using REDCap electronic data capture tool (Vanderbilt University, Nashville, TN).

2.3 Outcomes

The survey included questions about ED use of telemedicine, both whether the ED received telemedicine services and whether the ED or hospitals provided telemedicine services to patients in other locations. We focused on ED receipt of telemedicine because we were interested in EDs using telemedicine to access specialists or services not otherwise available. We refer to this as “ED telemedicine use.” The primary outcome was ED telemedicine use in 2016. This was based on self-reported responses to the survey item “Does your hospital/ED receive telemedicine services for the evaluation of patients in other EDs? Yes/No.” As a secondary outcome, among EDs that reported no receipt of telemedicine in 2016, we also examined ED adoption of telemedicine from 2016 to 2017 based on self-reported responses to the same question on the NEDI-USA 2017 survey. We performed follow-up calls to EDs to confirm responses when responses were unclear or changed from year to year.

2.4 Variables of interest

We categorized states dichotomously based on the presence of any telemedicine parity laws in 2016. We also calculated the duration of parity laws based on the difference between January 1, 2016, and the effective date for the law. In addition to the use of telemedicine, the NEDI-USA survey also collected data on other key ED characteristics related to overall and pediatric annual visit volumes and the presence of a pediatric area within the ED. We identified academic EDs based on...
the presence of an emergency medicine residency program. We classified EDs as rural when located outside of a core-based statistical area.

2.5 | Analysis

We used descriptive statistics to quantify ED telemedicine receipt in 2016 and 2017 and identified the frequency and proportion of EDs receiving telemedicine overall and stratified by state. Next, among EDs that did not receive telemedicine in 2016, we identified the number and proportion of EDs that adopted telemedicine by 2017; among those that did receive telemedicine in 2016, we identified the number and proportion of EDs that were no longer using telemedicine by 2017.

We performed bivariate comparisons of EDs with and without telemedicine in 2016. Among EDs without telemedicine in 2016, we performed bivariate comparisons of those adopting telemedicine by 2017 versus those that did not. We used the Fisher exact, chi-square, Kruskal-Wallis, or analysis of variance test as appropriate.

Next, we examined the relationship between the presence of a state telemedicine parity law and ED telemedicine use in a series of hierarchical logistic regression models, with ED as the level of observation and telemedicine use in 2016 as the outcome. The base model included only state as a random intercept (model 0). We then added presence of a state telemedicine parity law (model 1), and finally for model 2, we added other ED characteristics (annual ED visit volume, annual pediatric visit volume, academic ED, freestanding ED, rural location, and US region) to model 1. We examined change in intraclass coefficient (ICC) with the addition of variables in each model in the series. We use the ICC to quantify between-state variation. By examining changes in the ICC from model to the next, we are able to understand how much of the variation between states in their use of telemedicine is attributable to the additional variables added to the model. We repeated the same series of hierarchical logistic regression models restricted only to EDs without telemedicine in 2016 to identify characteristics independently associated with the adoption of telemedicine from 2016 to 2017.

3 | RESULTS

Of 5404 US EDs open in 2016, 4506 (83%) responded to the NEDI-USA survey. We excluded 88 EDs that did not report whether they received telemedicine, which yielded an analytic sample of 4418 EDs.
In this final sample, 2352 (53%) reported telemedicine use in 2016 and 2066 (47%) reported no telemedicine use. As shown previously,7 EDs with telemedicine had higher annual visit volumes (both overall and for pediatrics) and were less often academic, less often freestanding, and less often had dedicated pediatric ED areas; telemedicine use also varied by region (Supplemental Table A2).

In 2016, among the 50 states and the District of Columbia (DC), 5 states had full payment parity, and 21 (41%) had a telemedicine parity law of any kind, whereas 30 (59%) did not (Figure 1). The proportion of EDs using telemedicine varied widely across the states and DC, ranging from 13% in DC to 89% in Maine (Supplemental Table A3). In our multivariable model, the odds of ED telemedicine use did vary modestly by state; however, neither the presence nor duration of state parity laws were associated with use. We used the ICC to quantify between-state variation in telemedicine use. In the model accounting only for clustering by state, 13.4% of variation in ED telemedicine use was attributable to state. The addition of state telemedicine parity laws to the model did not additionally explain any variation in ED telemedicine use, nor did other ED characteristics (Table 1). The full multivariable model is presented in Table 2; an alternative version that examines ED adoption is presented in Supplemental Table A4.

Among the 2066 EDs without telemedicine in 2016, we had data on telemedicine use for 1781 (86%) in 2017; of these 1781 EDs, 331 (16%) adopted telemedicine by 2017. The presence and duration of state parity laws were not associated with odds of adoption from 2016 to 2017. Characteristics associated with adoption are presented in Supplemental Table A5.

### Discussion

Our goal was to determine the relationship between state telemedicine parity laws and likelihood an ED uses telemedicine. Although there was significant variation across states in the rate of telemedicine use among EDs, the rate of use was not associated with the presence or duration of state telemedicine parity laws.

**Table 1** Attributable variation in emergency department telemedicine use in 2016

| Model | ICC (95% CI) |
|-------|--------------|
| 0. Adjusted for clustering by state | 13.4 (8.7–19.9) |
| 1. Adjusted for clustering by state and for state TM parity laws<sup>a</sup> | 13.4 (8.7–20.0) |
| 2. Adjusted for clustering by state, for state TM parity laws, and for ED characteristics<sup>b</sup> | 13.5 (8.8–20.2) |

CI, confidence interval; ED, emergency department; ICC, intraclass correlation; TM, telemedicine.
<sup>a</sup>Adjusted for TM policy environment.
<sup>b</sup>Adjusted for ED same as model 1 and 2016 ED volume, 2016 pediatric volume, academic status, freestanding status, Census region, and rurality (core-based statistical area definition).

Our results are different from prior work both at the patient and hospital levels where telemedicine was associated with parity laws.3,4 Potential explanations for this difference include a different unit of analysis (ED vs hospital vs patient) and different settings, with some previous work focused on the rural setting. In addition, in this analysis we focused on EDs receiving telemedicine in contrast to other work in which hospitals may use telemedicine in settings outside of the ED.

It is somewhat surprising that the presence and duration of state telemedicine parity laws were not associated with the likelihood of an ED receiving telemedicine. However, there are multiple factors that may be important in telemedicine implementation, such as regulatory environment, ease of interstate credentialing, and even the extent of payment parity (whether partial or full).3,4 It is possible that partial payment parity is less important than full payment parity. However, because only 5 states had full payment parity during our study period, there was insufficient statistical power to explore this relationship.

As EDs are increasingly turning to telemedicine during the ongoing coronavirus disease 2019 pandemic, understanding the implications of payment policy and the regulatory environment on ED use of telemedicine is increasingly important. For example, some may argue that sweeping policy changes should be made to facilitate the continued use of telemedicine by EDs that have now invested in the technology. Although we would not discourage this, our results suggest that telemedicine use by EDs may not be influenced by such policy changes alone. Given that telemedicine has often not been directly billed to

### Table 2 Characteristics associated with emergency department telemedicine use in 2016

| Characteristics | Adjusted Odds Ratio<sup>a</sup> | 95% CI |
|----------------|-----------------------------|-------|
| Annual ED volume quartile | | |
| 0–7800 visits | 1.00 (referent) | 1.26–1.91 |
| 7801–20,490 | 1.55 | 1.67–2.81 |
| 20,491–43,000 | 2.16 | 1.28–2.24 |
| 43,001 or more | 1.69 | |
| Annual pediatric volume | | |
| < 3000 | 1.00 (referent) | 0.65–0.94 |
| ≥ 3000 | 0.78 | 0.81–1.25 |
| Unknown | 1.00 | |
| Academic ED | 0.36 | 0.25–0.52 |
| Freestanding ED | 0.58 | 0.45–0.75 |
| Rural location<sup>b</sup> | 1.57 | 1.28–1.92 |
| Region | | |
| Northeast | 1.00 (referent) | 0.39–1.53 |
| Midwest | 0.77 | 0.32–1.19 |
| South | 0.62 | 0.44–1.76 |
| West | 0.88 | |
| Presence of TM state parity laws | 1.02 | 0.88–1.17 |
| RI: state (variance) | 0.52 | 0.32–0.83 |

CI, confidence interval; ED, emergency department; RI, random intercept.
<sup>a</sup>Adjusted for clustering by state (with random intercept).
<sup>b</sup>Rural defined as EDs that are located outside of a core-based statistical area.
payors when used, there may be other strategies to support telemedicine implementation and ongoing use, for example, grant programs to offset initial start-up costs. It is also plausible that policy changes during the pandemic affected telemedicine billing practices, and further studies are warranted on how the policy changes during the coronavirus disease 2019 pandemic have affected the use of telemedicine in EDs.

Study limitations include the self-reported nature of our outcome variable and the dependence on respondents’ understanding of telemedicine. However, we have confidence in the responses, as survey respondents are usually ED directors or other individuals involved in ED operations who have high levels of understanding of ED-relevant technology and their own EDs’ resources. In addition, we included a clarifying script for phone respondents and an explanatory diagram to clarify the question (Supplemental Figure A2). Our study may also be subject to non-response bias, as a small proportion of US EDs did not respond to the survey. However, among all 5404 EDs open in 2016, we did achieve an 83% response rate, which offsets this risk. In addition, responding EDs were similar to non-responding EDs with the exception of minor differences in the proportion of freestanding and rural EDs (Supplement Table A6). An additional limitation is that we did not collect data on whether hospitals pay for the service or bill for the telemedicine encounters, which may contribute to telemedicine use and to the relationship between payment policy and use. Finally, our cross-sectional analysis was based on policy data from 2016 and ED data from 2016 and 2017; it is possible that there is a greater lag time in the association between policy environment and telemedicine use.

5 | CONCLUSIONS

Although many US states have payment parity laws for telemedicine, we did not find an association between state parity laws or state regulatory environment and ED receipt of telemedicine. These results suggest that other factors are driving the wide variation in ED use of telemedicine across states. These factors merit further investigation.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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