Association of a School-Based, Asthma-Focused Telehealth Program With Emergency Department Visits Among Children Enrolled in South Carolina Medicaid

John Bian, PhD; Kathryn K. Cristaldi, MD, MHS; Andrea P. Summer, MD, MSCR; Zemin Su, MS; Justin Marsden, BS; Patrick D. Mauldin, PhD; James T. McElligott, MD, MSCR

**IMPORTANCE** Telehealth may improve access to care for populations in rural communities. However, little is known about the effectiveness of telehealth programs designed for children.

**OBJECTIVE** To examine the associations of a school-based telehealth program in Williamsburg county (South Carolina) with all-cause emergency department (ED) visits made by children enrolled in Medicaid.

**DESIGN, SETTING, AND PARTICIPANTS** This Medicaid claims data analysis was conducted in Williamsburg county and 4 surrounding counties in South Carolina and included children aged 3 to 17 years who were enrolled in Medicaid and living in any of the 5 counties from January 2012 to December 2017. Williamsburg served as the intervention and the 4 surrounding counties without a telehealth program as the control; 2012 to 2014 was designated as the preintervention period, whereas 2015 to 2017 served as the postintervention period. The study was designed with a difference-in-differences specification, in which the unit-of-analysis was a child-month, and a subsample included children with asthma. The data analysis was performed from July 2018 to February 2019.

**EXPOSURES** The school-based telehealth program implemented in Williamsburg county in 2015.

**MAIN OUTCOMES AND MEASURES** The binary outcome was the status of at least 1 all-cause ED visit by a child in a given month.

**RESULTS** The full sample included 2,443,405 child-months from 23,198 children in Williamsburg county and 213,164 children in the control counties. The mean (SD) proportions of monthly ED visits in Williamsburg were 3.65% (0.10%) during the preintervention and 3.87% (0.11%) during the postintervention. The corresponding proportions of the 4 control counties were 3.37% preintervention (0.04%), and 3.56% postintervention (0.04%), respectively. The trends in the proportion were paralleled. In the asthma subsample, the proportions in Williamsburg were 3.16% (0.31%) during the preintervention and 3.38% (0.34%) during the postintervention, respectively. The proportions for the control counties were 3.02% preintervention (0.10%) and 3.90% postintervention (0.11%), respectively. There was an interaction of the proportions between the pre/postintervention period and the intervention/control counties in this subsample. The regression analysis of the full sample showed no association of the telehealth program with ED visits. The additional analysis of the asthma subsample showed that this program was associated with a reduction of 0.66 (95% CI, −1.16 to −0.17; P < .01) percentage point per 100 children per month in ED visits, representing an approximately 21% relative decrease.

**CONCLUSIONS AND RELEVANCE** Although we found no association of this program with the ED visits of the overall studied population, this study suggests that telehealth with a focus on chronic pediatric diseases, such as asthma, may deliver substantial health benefits to rural and medically underserved communities.
Telehealth has become a viable approach for improving access to care among populations living in rural and medically underserved areas. However, major gaps exist in the literature regarding the effectiveness of telehealth. First, although evidence supports the effectiveness of health services delivered by telehealth to adult populations, to our knowledge, little is known about the effectiveness of telehealth programs specifically designed for children with chronic diseases. Second, most literature on telehealth has focused on use outcomes. More studies are needed to examine the association of telehealth with health outcomes.

Third, most evidence on the effectiveness of telehealth programs has been generated from observational studies with a pre-post or a post-only design that have failed to support an improved effectiveness as a result of telehealth. The American Academy of Pediatrics has endorsed school-based telehealth services for chronic pediatric diseases.

Asthma is one of the most common chronic diseases of childhood and is associated with substantial morbidity and high rates of school absenteeism. The risk of serious asthmatic exacerbations often requires emergency care. In 2014, South Carolina initiated a school-based telehealth program that has been adopted in 7 counties. These school clinics were connected by secured telehealth video devices to pediatric clinicians (ie, general/specialty pediatricians and pediatric nurses) who were capable of providing prompt clinical services to children who needed immediate care during school hours. Furthermore, the South Carolina Medicaid payment policy provides the same reimbursement rates for school-based telehealth as in-person services. Although this telehealth program was designed to treat all acute and chronic diseases, an asthma-focused training and educational component was integrated into this program. Available direct access to pediatric clinicians in areas where there are fewer or no registered pediatric clinicians may substantially improve timely asthma diagnoses and appropriate treatment regimens. Because adherence to asthma medications is critical in lowering the risk of serious asthmatic exacerbations that may require emergency department (ED) visits, school nurses in the program were trained by the pediatric clinicians as part of this telehealth program to administer the appropriate asthma medications to children with a diagnosis of asthma to ensure adherence to therapies. In addition, an increased understanding of the diagnosis and treatment of asthma at the school clinics via the interactions of school nurses and the pediatric clinicians may further improve asthma outcomes even when the pediatric clinicians are not available via telehealth services.

Using South Carolina Medicaid claims data from 2012 to 2017, we applied a natural experimental design to examine the associations of the telehealth program in Williamsburg county, South Carolina, with the likelihood of all-cause ED visits among children enrolled in Medicaid and a subsample of these children with an asthma diagnosis.

### Methods

#### Data Sources

This was a retrospective analysis of South Carolina Medicaid claims data from 2012 to 2017. The primary information relevant to this study included Medicaid monthly enrollment profiles (ie, monthly enrollment status, demographics, and county of residence) and diagnosis codes from claims of all services reimbursed by South Carolina Medicaid. This research was approved by the University of South Carolina institutional review board. Consent was waived because the analysis was independent of the intervention and used deidentified data.

#### Study Samples

We created 2 study samples. The first one was a full sample that consisted of 6 longitudinal panels, 1 for each of the 6 years from 2012 to 2017. Because all 6 panels were independently and identically assembled, we would only use the 2015 panel as an example for illustrative purposes. The children eligible for this 2015 panel included those who were ages 3 to 17 years, were enrolled in South Carolina Medicaid at least 1 month, and lived in Williamsburg or any of its 4 neighboring Clarendon, Georgetown, Orangeburg, and Berkeley counties in 2015. (One neighboring county, Florence, was not chosen because some of its schools had implemented this telehealth program.) The unit of analysis was a child-month in this panel, in which each child contributed the number of observations equal to the number of months enrolled in South Carolina Medicaid in 2015. Similarly, we used this full sample to create an asthma subsample that only included children with a diagnosis of comorbid asthma, described later in this article. A child in this full sample could have been observed multiple times in a given year and/or during the entire 6-year study period. If the county of residence of a child changed during a given year, we assumed the earliest county of residence recorded in the Medicaid enrollment profile as the county of residence during that given year.

#### Outcome Measurement and Independent Variables

The binary outcome variable of interest to this study was the status of all-cause ED visits in a given month, coded as 1 if there were at least 1 ED visit (regardless of the county location of hospitals where ED visits occurred) in the given month or 0 otherwise. The key independent variable used to capture the associations of the telehealth program with all-cause ED visits was the interaction term of the intervention (ie, Williamsburg) and the postintervention period (ie, 2015-2017) variables, which was equal to 1 if children were in Williamsburg...
from 2015 to 2017 or 0 otherwise. Williamsburg began to implement this program in all of its 11 public schools at the beginning of 2015. One of the 11 schools started implementing the program as a pilot 3 months earlier than the other 10 schools in which this program simultaneously started on January 1, 2015; thus, we assumed that all 11 schools in Williamsburg started this program on January 1, 2015. The 4 neighboring counties did not have such a program during the entire study period. Other independent variables were child-level demographics that included age, race/ethnicity, and sex. Age was categorized into 3 levels, representing children ages 3 to 7 years, 8 to 12 years, or 13 to 17 years. Race/ethnicity was categorized into 3 groups: African American, white, or other race/ethnicity. A set of 8 child-level comorbidities was included in this study (diagnosis codes for the comorbidities listed in the eTable in the Supplement). For example, a child with comorbid asthma in a given year was coded as 1 if this child had any recorded primary or secondary asthma diagnoses in that year or 0 otherwise.

Statistical Analysis
We applied a natural experimental design (ie, a nonrandomized cohort study with a nonequivalent control group) to examine the associations of the school-based telehealth program in Williamsburg with the likelihood of all-cause ED visits made by children enrolled in Medicaid. One key advantage of a natural experimental design over a pre-post or a post-only design is the strength of the internal validity for causal inference.17-19 A typical natural experimental design has 2 assumptions. The first assumes that there may be underlying systematic differences between an intervention site and a control site. In other words, the intervention may be associated with characteristics of the intervention site (ie, Williamsburg) by design but not with individuals (ie, children in South Carolina Medicaid) within the intervention site. The second assumes that any secular changes over time should affect the intervention and the control similarly.

In the main statistical analysis, we examined the associations of the telehealth program in Williamsburg with the likelihood of all-cause ED visits, using first the full sample and then the asthma subsample. Multivariable linear probability models (LPMs) with a difference-in-differences (DD) specification were used for estimation, in which we designated Williamsburg as the intervention and the 4 neighboring counties without the telehealth program as the control. The window of 2012 to 2014 was designated as the preintervention period and the window of 2015 to 2017 as the postintervention period. The LPMs, instead of the logistic models, were used in the statistical analysis primarily for an easier interpretation of estimated coefficients of the interaction terms.20-22 The DD specification explicitly assumed that the time trend of ED visits caused by secular changes in Williamsburg was similar to that in the 4 control counties if the program had not been implemented in Williamsburg. Additional covariates included child-level variables. We applied the county and quarterly time fixed effects to control for time-invariant county heterogeneity (eg, systematic differences in county-specific characteristics) and secular changes over time (eg, in Medicaid enrollment policies), respectively. The unit of analysis was a child-month. All hypothesis testing was 2-sided and used a statistical significance level of \( P < .05 \). All statistical analyses were conducted using SAS, version 9.4 (SAS Institute).

We performed a sensitivity analysis that allowed the associations of the telehealth program to vary over the postintervention period, in part because the accumulated learning experience, particularly pertinent to medication adherence and asthma self-management skills, may deliver greater health benefits over time. To proceed with this additional analysis, we used the similar LPMs by replacing the single interaction term in the main analysis by creating 3 separate interaction terms of the intervention and each of the 3 postintervention years.

Results
Table 1 reports the descriptive statistics of the full sample of all children that were ages 3 to 17 years and enrolled in South Carolina Medicaid between 2012 and 2017. This full sample included a total of 2,443,405 child-months, of which 243,979 (10.0%) were from Williamsburg. The within-county (intervention or control) variation in child-level demographics was relatively stable over time. However, the variation in child-level comorbidities was considerably high (nationwide changes in diagnosis coding occurred in late 2015). Figure 1 summarizes the average proportions of monthly ED visits by aggregating the 6 annual periods into 2 pre/postintervention periods. The mean (SD) proportions of monthly ED visits in Williamsburg were 3.65% (0.10%) during the preintervention and 3.87% (0.11%) during the postintervention. The corresponding proportions of the control counties were 3.37% (0.14%) and 3.56% (0.14%), respectively. The trends in the proportion between the intervention and control counties were paralleled. A DD unadjusted association of the program with ED visits showed a slight increase of 0.03 ([3.65-3.37]-[3.87-3.56]) percentage point per 100 children per month in ED visits because of the program.

The asthma subsample contained 259,751 child-months, in which 21,934 (8.4%) were from Williamsburg (Table 2). The time trends of within-county variation in demographic and comorbid variables of the subsample were similar to those observed in the full sample. Figure 2, similarly to Figure 1, summarizes the average proportions in ED visits over the 2 pre/postintervention periods. The mean (SD) proportions of monthly ED visits in Williamsburg were 3.16% (0.31%) during the preintervention and 3.38% (0.34%) during the postintervention. The corresponding proportions of the control counties were 3.02% (0.10%) and 3.90% (0.11%), respectively. There was an interaction of the proportions between the pre/postintervention period and the intervention/control counties in this asthma subsample. A DD unadjusted association showed a reduction of 0.66 ([3.16-3.38]-[3.02-3.90]) percentage point per 100 children per month in ED visits because of the program. In addition, we observed that the trend of the annual proportions of ED visits in Williamsburg decreased at a faster pace than that in the control counties during the post-
The regression results from the multivariable LPMs with the DD specification are reported in Table 3. The dependent variable was multiplied by 100 for reporting purposes. Using the full sample, we found no overall association of the program with the likelihood of all-cause ED visits during the postintervention period and there was no statistically significant variability of this overall association over time. We found that demographics played significant roles in likelihood of ED visits. For example, compared with children ages 3 to 7 years, those ages 8 to 12 years were associated with a reduction of 1.08 (95% CI, −1.13 to −1.03; \( P < .001 \)) percentage point per 100 children per month in the likelihood of ED visits. Compared with African American children, white children were associated with a reduction of 0.49 (95% CI, −0.57 to −0.46; \( P < .001 \)) percentage point.

Using the asthma subsample, we found that the program in Williamsburg was associated with an overall reduction of 0.66 (95% CI, −1.16% to −0.17%; \( P < .01 \)) percentage point per 100 children per month in the likelihood of ED visits. This estimated reduction represented an approximately 21% relative decrease in ED visits. Furthermore, our additional analysis showed that the strength of the association increased over the postintervention period, becoming most apparent during...
the third year of the program. Specifically, the program was not statistically significantly associated with the reductions in the likelihood of ED visits during the first 2 years postintervention, but was statistically significantly associated with a reduction of 1.11 (95% CI, −1.82 to −0.41; \( P < .01 \)) percentage point per 100 children per month (or an approximately 35% relative decrease) during the third year.

### Discussion

The school-based telehealth program implemented in a rural South Carolina county was not associated with an overall reduction in all-cause ED visits among all children age 3 to 17 years who were enrolled in Medicaid. However, this study showed that this program was associated with a 21% reduction in the likelihood of ED visits among a subsample of children with asthma. Furthermore, because there was no association of the program with the likelihood of ED visits among the children with asthma during the first 2 years postintervention, the significant reduction in the asthma subsample estimated during the entire 3 years postintervention appeared to concentrate in the third year.

Comparing these results with the existing evidence may be challenging. This study compared the community-level benefit of a rural county with the telehealth program with that of similar neighboring counties without such a program. However, almost all available empirical evidence on the effectiveness of telehealth programs was generalized from the direct...
comparisons of telehealth with in-person visits. To our knowledge, there is little existing evidence comparable with our finding of no overall association of the school-based telehealth program with all-cause ED visits of children with acute and chronic diseases. A few studies evaluating the effectiveness of telehealth programs for children with asthma suggested that telehealth may improve access to specialty care and functional status. A recent randomized asthma-specific study that compared a school-based telehealth intervention with usual care showed that the intervention increased the symptom-

Table 3. Results From Multivariable Linear Probability Models With County and Quarterly Time Fixed Effects \(^{a,b,c}\)

<table>
<thead>
<tr>
<th>Type of Analysis</th>
<th>Main Estimate (95% CI)</th>
<th>P Value</th>
<th>Sensitivity Estimate (95% CI)</th>
<th>P Value</th>
<th>Asthma Subsample (n = 259 751 Child-Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall association of telehealth with ED visits</td>
<td>0.05 (−0.11 to 0.21)</td>
<td>.53</td>
<td>NA</td>
<td>NA</td>
<td>−0.66 (−1.16 to −0.17)</td>
</tr>
<tr>
<td>Varying associations of telehealth with ED visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.42 (−1.13 to 0.29)</td>
</tr>
<tr>
<td>2015</td>
<td>NA</td>
<td>NA</td>
<td>−0.10 (−0.31 to 0.12)</td>
<td>.37</td>
<td>NA</td>
</tr>
<tr>
<td>2016</td>
<td>NA</td>
<td>NA</td>
<td>0.09 (−0.14 to 0.31)</td>
<td>.46</td>
<td>NA</td>
</tr>
<tr>
<td>2017</td>
<td>NA</td>
<td>NA</td>
<td>0.18 (−0.06 to 0.43)</td>
<td>.14</td>
<td>−1.11 (−1.82 to −0.41)</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-7</td>
<td>1 (Reference)</td>
<td></td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>8-12</td>
<td>−1.08 (−1.13 to −1.03)</td>
<td>&lt;.001</td>
<td>−1.08 (−1.13 to −1.03)</td>
<td>&lt;.001</td>
<td>−0.73 (−0.89 to −0.57)</td>
</tr>
<tr>
<td>13-17</td>
<td>−0.62 (−0.68 to −0.56)</td>
<td>&lt;.001</td>
<td>−0.62 (−0.68 to −0.56)</td>
<td>&lt;.001</td>
<td>−0.27 (−0.45 to −0.08)</td>
</tr>
<tr>
<td>Male</td>
<td>−0.04 (−0.09 to 0.00)</td>
<td>.06</td>
<td>−0.04 (−0.09 to 0.00)</td>
<td>.06</td>
<td>0.12 (−0.02 to 0.26)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1 (Reference)</td>
<td></td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>−0.49 (−0.57 to −0.46)</td>
<td>&lt;.001</td>
<td>−0.49 (−0.57 to −0.46)</td>
<td>&lt;.001</td>
<td>−0.76 (−0.93 to −0.59)</td>
</tr>
<tr>
<td>Other race/ethnicity</td>
<td>−0.43 (−0.51 to −0.36)</td>
<td>&lt;.001</td>
<td>−0.41 (−0.51 to −0.36)</td>
<td>&lt;.001</td>
<td>−0.03 (−0.26 to 0.19)</td>
</tr>
<tr>
<td>Comorbidities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>0.38 (0.29 to 0.47)</td>
<td>&lt;.001</td>
<td>0.38 (0.29 to 0.47)</td>
<td>&lt;.001</td>
<td>NA</td>
</tr>
<tr>
<td>Gastroesophageal reflux</td>
<td>3.81 (3.56 to 4.06)</td>
<td>&lt;.001</td>
<td>3.81 (3.56 to 4.06)</td>
<td>&lt;.001</td>
<td>1.56 (1.18 to 1.94)</td>
</tr>
<tr>
<td>Obesity</td>
<td>0.93 (0.77 to 1.08)</td>
<td>&lt;.001</td>
<td>0.92 (0.77 to 1.08)</td>
<td>&lt;.001</td>
<td>0.01 (−0.30 to 0.32)</td>
</tr>
<tr>
<td>Obstructive sleep apnea</td>
<td>2.68 (2.38 to 2.97)</td>
<td>&lt;.001</td>
<td>2.68 (2.38 to 2.97)</td>
<td>&lt;.001</td>
<td>0.69 (0.26 to 1.12)</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>1.99 (1.88 to 2.10)</td>
<td>&lt;.001</td>
<td>1.99 (1.88 to 2.10)</td>
<td>&lt;.001</td>
<td>−0.01 (−0.21 to 0.18)</td>
</tr>
<tr>
<td>Anxiety, depression, and emotional disturbance</td>
<td>2.90 (2.76 to 3.04)</td>
<td>&lt;.001</td>
<td>2.90 (2.76 to 3.04)</td>
<td>&lt;.001</td>
<td>1.07 (0.77 to 1.37)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4.09 (3.59 to 4.59)</td>
<td>&lt;.001</td>
<td>4.09 (3.59 to 4.59)</td>
<td>&lt;.001</td>
<td>1.62 (0.81 to 2.43)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3.15 (2.68 to 3.63)</td>
<td>&lt;.001</td>
<td>3.15 (2.68 to 3.63)</td>
<td>&lt;.001</td>
<td>2.96 (1.91 to 3.00)</td>
</tr>
</tbody>
</table>

Abbreviations: ED, emergency department; NA, not applicable.

a The dependent variable (status of all-cause ED visits) was multiplied by 100 in the models.

b The results of county and quarterly time fixed effects, all of which were jointly statistically significant (P < .001), were not reported here.

c Standard errors adjusted for heteroscedasticity.
free days in an urban setting. However, a meta-analysis of randomized studies did not find that telehealth programs reduced ED visits of children with asthma.

One plausible reason for the lack of an association for all children in the full sample may be because most healthy children are resilient and thus do not often use ED services, with the exception of those with chronic diseases. As a result, the full-sample analysis may not allow us to identify the strong signal of the reduced all-cause ED visits. Therefore, it is not surprising that the analysis of the asthma subsample showed significant reductions in ED visits by children who received an asthma diagnosis postintervention. Furthermore, timely asthma diagnosis and adherence to appropriate asthma therapies may significantly improve outcomes, such as the lowering of ED visits. A similar effectiveness of disease-specific telehealth programs has been found elsewhere. For example, telehealth programs designed for timely diagnosis and treatment of acute ischemic stroke have demonstrated significant improvements in health outcomes largely because tissue plasminogen activator was swiftly used to treat the appropriate stroke patients.

Limitations
This study has some limitations. First, the results may be subject to biases. One source of the biases may be the spillover effect from the intervention to the control that could be a potential threat to the internal validity. For example, there may be a concern over the variation in the number of children enrolled in Medicaid over time. However, the results would not be biased if the variation was not associated with the telehealth program implemented in Williamsburg. Furthermore, the program in Williamsburg required a substantial investment in pediatric teams and equipment that was not available in the control counties. Another source may be uncontrolled time-varying county-specific characteristics. In October 2015, the only hospital in Williamsburg was closed after it was damaged by flooding. This closure could have affected the level of ED services available to children living in Williamsburg. However, the ED remained open while the hospital was closed, and little evidence from the analysis of the full sample suggested the overall level of ED visits at Williamsburg experienced noticeable decreases since 2015. Second, there may be a concern over the choice of all-cause ED visits over asthma-specific ED visits as the studied outcome. The reasons for this choice were primarily because of the lower counts of asthma-specific ED visits and low sensitivity/specificity for identifying these visits in claims data analysis. Furthermore, if non-asthma-associated ED visits remained stable within each county over time, the DD specification could have alleviated this concern. Last, this study may have limited generalizability because it was an analysis of the association with a single outcome of 1 school-based telehealth program in 1 rural South Carolina county for children enrolled in Medicaid. Thus, our findings may not be applicable to privately insured children, different diseases or conditions, or other outcomes.

Conclusions
To our knowledge, this is the first natural experimental design used for telehealth evaluation. Our finding suggests that although this school-based telehealth program may have no overall benefit to children with little access to care, this program may deliver substantial health benefits to those with serious chronic diseases, such as asthma, living in rural and medically underserved communities. First, this study suggests that the reasons for the benefit to children with asthma from this telehealth program may be multidimensional. A combination of the connectivity of pediatric clinicians with children with asthma via telehealth services for disease assessment and management, better medication adherence, specifically trained nurses at school clinics, and the South Carolina Medicaid payment policy of telehealth services may all contribute to the success for achieving the observed benefit. Second, the degree of success gained from this type of program implemented at the community level may be incremental over time because of the amount of accumulative learning experiences of participants required for such a success. Third, commitments in financial support of this school-based telehealth program from the local, state, and federal levels are critical to the sustainability of this program. In the future, more research that uses strong research designs and focuses on chronic diseases is needed to further strengthen the evidence of the association of pediatric telehealth programs with health outcomes.

Statistical analysis: Bian, Su, Marsden.
Obtained funding: Cristaldi, McElligott.
Administrative, technical, or material support: Cristaldi, Marsden, Mauldin.
Supervision: Bian, Cristaldi, McElligott.
Conflict of Interest Disclosures: Drs Summer, Mauldin, and McElligott reported grants from the Duke Endowment during the conduct of the study. No other disclosures were reported.
Funding/Support: This research was supported by the Health Resources and Services Administration of the US Department of Health and Human Services as part of the National Telehealth Center of Excellence Award (U66 RH31458-01-00), and the Duke Endowment.
Role of the Funder/Sponsor: The funding organizations had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

REFERENCES
Challenges of Telemedicine.


