Research Report

Experiences of Community Health Centers in Expanding Telemedicine

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Preface

From 2017 to 2020, the California Health Care Foundation funded the Sustainable Models of Telehealth in the Safety Net initiative to expand the use of telemedicine in nine participating community health centers in California. To evaluate the experiences of participating health centers in growing their telemedicine programs, we conducted a mixed methods formative and summative evaluation. Quantitative data sources included health center telemedicine volume and progress report data, while qualitative data sources included interviews with telemedicine coordinators and health center clinicians conducted by telephone and at site visits, along with focus groups with chief financial officers. The results of this evaluation will be informative for health centers and policymakers aiming to increase the use of telemedicine to improve access to care in safety net settings.

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Introduction

Telemedicine, or the provision of health care services at a distance by means of telecommunications technology, can improve access to care by bringing medical care into communities with limited access to providers or facilities, reduce wait times, and improve convenience. However, when telemedicine is offered in safety-net settings, it tends to be a low-volume service. To support the growth of telemedicine in large, multisite community health centers and ensure that it can have a meaningful impact on access to specialty care, the California Health Care Foundation (CHCF) invested in the Sustainable Models of Telehealth in the Safety Net (SMTSN) initiative, which was in place from 2017 to 2020. CHCF provided funding for nine participating health centers to hire and maintain dedicated telemedicine staff for 24 months, created a learning community to facilitate peer learning, and offered technical assistance. The initiative also included the participation of three Medicaid managed care plans, which were interested in expanding access to specialty care through telemedicine for their members.

Although the SMTSN initiative and this evaluation occurred before the coronavirus disease 2019 (COVID-19) pandemic dramatically altered the regulation, reimbursement, and use of telemedicine services across the health care system in spring 2020, the findings presented here are relevant to health centers that are trying to rapidly expand telemedicine in response to the pandemic, and the barriers and strategies identified in the evaluation are likely to have ongoing relevance once some of the changes in place for the duration of the emergency are rolled back.

To evaluate the experiences of participating health centers in growing their existing telemedicine programs, the RAND Corporation research team conducted a mixed-methods formative and summative evaluation. We explored the following research questions:

1. What staffing, programmatic, and process changes were implemented to expand telemedicine during the initiative?
2. What barriers did health centers face in expanding telemedicine?
3. What was the impact of health center activities on telemedicine volume and realized access to telemedicine services?
4. Were high-volume telemedicine programs and dedicated telemedicine staff likely to be sustained in participating health centers, and what factors contribute to sustainability?

Methods

Quantitative data sources used in the evaluation included health center telemedicine volume and progress report data. Qualitative data sources included interviews with telemedicine

coordinators and health center clinicians, which were conducted by telephone and at site visits, and focus groups with chief financial officers. In quantitative analyses, we first calculated descriptive statistics, comparing proportions using chi-square statistics. We plotted the telemedicine volume data to assess changes in monthly volumes visually. Average monthly telemedicine volumes pre- and postintervention at each site and overall were compared using *t*-tests. To assess whether the SMTSN initiative changed the volume of telemedicine visits, we used an interrupted time series design. For the qualitative data, we employed inductive and deductive analytic approaches to identify themes.

Results

During the initiative, all health centers added dedicated telemedicine staff; six used their grant funding to hire one or more dedicated telemedicine coordinators. The most common approaches to expand telemedicine volume were to add new service lines, contract with new vendors or purchase additional blocks of time with existing vendors, offer telemedicine services at new clinic locations, and purchase new equipment. In addition, many health centers aimed to make telemedicine visits more efficient and increase utilization by improving workflow, training and retraining staff, and promoting telemedicine across the organization. The most-common barriers to growing telemedicine volume within established programs included variable and insufficient reimbursement, technical difficulties, staffing challenges, insufficient physical space, and challenges working with remote specialists.

In total, there were 74,830 scheduled and 53,135 completed visits across the nine health centers during the 24-month implementation period. The most common telemedicine visit was with a behavioral health provider (48.3 percent of total visits), followed by visits with an ophthalmologist or optometrist (26.3 percent). All nine health centers offered tele–mental health services (typically psychiatry), and eight health centers had tele-ophthalmology (typically diabetic retinopathy screening). Other common specialists providing telemedicine visits included endocrinologists (seven health centers), rheumatologists (six health centers), and dermatologists (six health centers). Health centers reported that between 1 and 9 percent (median of 3 percent) of all patients had at least one telemedicine visit in the final six months of the initiative. Overall, 3.1 percent of all health center encounters over that six-month period were telemedicine visits. Most health centers (eight of nine) in the initiative experienced a statistically significant increase in telemedicine volume over the 24-month implementation period. On average, prior to the initiative, health centers had 153 telemedicine visits per month. This increased to an average of 239 visits per month after the initiative, which represents a 56-percent increase. The two health centers that experienced the most growth increased average monthly visit volume by 160 percent and 196 percent, respectively. One health center experienced a decline in visit volume, and one grew by only 13 percent.

Although there was near-universal agreement among participating health centers that telemedicine would continue after the initiative for a variety of reasons, including ongoing patient need and alignment with strategic priorities and health center values, staff did not specify a particular volume goal. In general, staff from most health centers argued that telemedicine services were likely permanent, but that financial factors would determine the scope of services.

Conclusions

The initiative, which consisted of funding for dedicated staff (including a coordinator), a learning collaborative, and technical assistance, was associated with the significant expansion of telemedicine in participating health centers. The initiative showed that, with a modest staffing investment, health centers were capable of rapid growth. However, ongoing challenges to implementation and sustained growth were identified. In the future, the financial sustainability of large telemedicine programs aiming to increase access to specialty care within community health centers likely will require more-generous reimbursement policies across payers or from external revenue sources, such as grant funding. Furthermore, it appeared that, at the end of the initiative, telemedicine for specialty services was still benefiting only a small percentage of health center patients. Using the evaluation results, the research team developed several recommendations for health centers and policymakers to support telemedicine implementation.

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This report would not have been possible without the contributions of dozens of individuals who participated in interviews at each of the nine health centers that are the focus of this report. The information that they shared with us about their successes and challenges is integral to this report and can help other community health centers in the United States expand telemedicine.

Abbreviations

CCHP	Center for Connected Health Policy
CFO	chief financial officer
CHCF	California Health Care Foundation
CHIP	Children's Health Insurance Program
COVID-19	coronavirus disease 2019
FQHC	federally qualified health center
HRSA	Health Resources and Services Administration
ITS	interrupted time series
MA	medical assistant
PCP	primary care provider
PPS	prospective payment system
RE-AIM	Reach, Effectiveness, Adoption, Implementation, and Maintenance
SMTSN	Sustainable Models of Telehealth in the Safety Net
UDS	Uniform Data System

1. Introduction and Background

According to the National Association of Community Health Centers, there are approximately 1,400 community health centers that serve 29 million patients in the United States. These organizations receive grant funding under the Health Center Program as authorized under Section 330 of the Public Service Act and aim to "provide affordable, high quality, comprehensive primary care to medically underserved populations, regardless of their insurance status or ability to pay for services" (National Association of Community Health Centers, 2020).

Ninety-one percent of health center patients are low-income, and the majority (63 percent) are members of racial and ethnic minority groups. Furthermore, 82 percent of health center patients are uninsured or publicly insured and represent a population that has faced numerous barriers to accessing health care (National Association of Community Health Centers, 2020).

Many believe that *telemedicine*, or the provision of health care services at a distance by means of telecommunications technology, can improve access to and quality of care by bringing medical care into communities with limited access to providers or facilities, reduce wait times, and improve convenience. Telemedicine services that allow patients to remain in their local communities can be especially important for low-income patients, who might lack paid sick leave or have limited transportation options when seeking care. However, despite its promise, telemedicine is underutilized by safety-net providers. In 2018, the Health Resources and Services Administration (HRSA) reported that 43 percent of health centers nationally and 49 percent of health centers in California offered some type of telemedicine, with tele–mental health services as the most common application (68 percent) (HRSA, 2018). HRSA data suggest that telemedicine adoption by health centers is growing, and California is a leader in this area; however, more work must be done to ensure that telemedicine can maximize its potential to increase access for the underserved.

Numerous barriers to establishing and maintaining telemedicine programs in the safety net have been identified. Examples of such barriers include low and inconsistent reimbursement across payers, a lack of provider acceptance, a lack of interoperability, challenges integrating telemedicine into established workflows, a high rate of missed appointments, the lack of a clinical champion, a lack of broadband internet, and challenges related to credentialing and licensing (Antoniotti, Drude, and Rowe, 2014; Center for Connected Health Policy, undated; Center for Connected Health Policy, 2017; Institute of Medicine, 2012; Moore et al., 2016; Nelson et al., 2016; Tracy et al., 2008; Uscher-Pines and Kahn, 2014; Uscher-Pines et al., 2016; Uscher-Pines, Rudin, and Mehrotra, 2017; Wilson et al., 2017). A 2015 report by the Center for Connected Health Policy (CCHP) described the challenge of sustaining telemedicine programs in traditional reimbursement models. At present, most telemedicine programs do not have high enough volumes to operate without grant funding, and high volumes are required to justify

investment in telemedicine capabilities; thus, the traditional reimbursement landscape creates barriers to long-term sustainability (Center for Connected Health Policy, 2015).

In 2017, recognizing many of these barriers and telemedicine's unrealized potential to improve access to care in the safety net, the California Health Care Foundation (CHCF) invested in the Sustainable Models of Telehealth in the Safety Net (SMTSN) initiative to expand the use of telemedicine to increase access to specialty care in nine participating health centers in California (California Health Care Foundation, 2018). CHCF's goal was to help transform participating health centers from low-volume to high-volume telemedicine providers that are dedicated to improving access to specialty care through technology. By increasing telemedicine volume, health centers could have a more significant impact on access to care and health outcomes. To accomplish this goal, CHCF recruited large, multisite health centers with prior experience with telemedicine and an interest in further increasing volume. CHCF sought out health centers with prior experience because it recognized that it can take many months for a health center to launch a telemedicine program for the first time, and the initiative aimed to have an impact on utilization quickly. The initiative was implemented from 2017 to 2020 and involved multiple components. CHCF provided health centers funding to hire and maintain dedicated telemedicine staff for 24 months, created a learning community to facilitate peer learning, and offered technical assistance. It also collaborated with three Medicaid managed care plans to ensure predictable reimbursement for a subset of telemedicine services and offer support (e.g., through grants or incentive payments) to help offset health center costs. Health plans, furthermore, helped select the health centers for inclusion in the initiative.

Participating health centers were given flexibility in terms of which dedicated staff member(s) they supported with the funding, although many chose to hire and maintain a telemedicine coordinator. They also were given the flexibility to expand their telemedicine programs according to patient need and local priorities. Therefore, experiences in expanding telemedicine varied considerably across sites. CHCF had heard from stakeholders in California that insufficient staffing to support telemedicine was a key barrier to program growth, and health centers with dedicated staffing seemed to have higher-volume programs. As a result, it invested resources to support dedicated staff at participating health centers. The core hypothesis of the initiative was that having dedicated telemedicine staff could enable programs to improve, mature, and grow, given that many health centers struggle to find adequate staff time and efficient workflows to integrate telemedicine fully into daily operations.

Participating Health Centers

Participating health centers comprised eight federally qualified health centers (FQHCs) and one community health center that receives funding from the Indian Health Service to provide care for American Indians and Alaska Natives (Chapa-De Indian Health, undated). FQHCs receive grant funding from HRSA to provide primary care to people who are low-income or

medically underserved. To characterize health centers, we obtained data on clinic services offered, year established, prior experience with telemedicine, and other characteristics clinic websites, SMTSN progress reports, and other materials (e.g., publicly available reports). See Table 1.1 for examples of the characteristics of these health centers.

All of the health centers provide primary care services, including gynecological care, pediatrics, perinatal care, and treatment of older adults, and all provide behavioral health and dental health services at one or more locations. Approximately half of the health centers offer podiatry services, psychiatry, in-house pharmacy, and express or urgent care services at one or more locations.

Table 1.1. Health Center Characteristics

Clinic Name	Year Health Center Was Established	Number of Clinical Sites	Years Operational Telemedicine, as of 2017	Available Telemedicine Specialties at SMTSN Endpoint[a]
Ampla Health	1964	14	More than 10	• Dentistry • Dermatology • Diabetic retinopathy • Psychiatry
Borrego Health	2002	23	More than 10	• Diabetic retinopathy • Infectious disease • Primary care • Psychiatry • Psychotherapy
Chapa-De Indian Health	1974	2	Less than 4	• Cardiology • Dermatology • Diabetic retinopathy • Endocrinology • Gastroenterology • Infectious disease • Nephrology • Neurology • Psychiatry • Psychotherapy • Rheumatology
Clínicas de Salud del Pueblo	1970	13	More than 10	• Dermatology • Diabetic retinopathy • Psychiatry
El Dorado Community Health Centers	2003	4	Less than 4	• Dentistry • Dermatology • Diabetic retinopathy • Endocrinology • Gastroenterology • Infectious disease • Nephrology • Neurology • Psychiatry • Rheumatology
Neighborhood Healthcare	1969	16	4–9	• Dentistry • Diabetic retinopathy • Psychiatry • Psychotherapy

Clinic Name	Year Health Center Was Established	Number of Clinical Sites	Years Operational Telemedicine, as of 2017	Available Telemedicine Specialties at SMTSN Endpoint[a]
Open Door Community Health Centers	1971	12	More than 10	• Dermatology • Diabetic retinopathy • Endocrinology • Gastroenterology • Infectious disease • Neurology • Nutrition • Psychiatry • Pulmonology • Rheumatology
Shasta Community Health Center	1988	6	More than 10	• Allergy or immunology • Endocrinology • Neurology • Pain management • Perinatology • Psychiatry • Rheumatology • Urology
West County Health Centers	1974	6	More than 10	• Diabetic retinopathy • Dermatology • Endocrinology • Rheumatology • Transgender care

NOTE: The year established data were obtained from health center websites (Ampla Health, undated; Borrego Health, undated-a; Chapa-De Indian Health, undated; Clínicas de Salud del Pueblo, undated-a; El Dorado Community Health Centers, undated; Neighborhood Healthcare, undated-a; Open Door Community Health Centers, undated-a; Shasta Community Health Center, undated-a; West County Health Centers, undated-a). With the exception of Chapa-De Indian Health (Chapa-De Indian Health, undated), the number of sites data were obtained from the HRSA Uniform Data System (UDS) (HRSA, undated-b).
[a] Available telemedicine specialties at the SMTSN endpoint were reported by health center staff during qualitative interviews and in final progress reports collected through the initiative. The lists of specialties are not exhaustive.

The health centers share a commitment to treating the underserved. To characterize the patient populations served by these community health centers, including such characteristics as total patients seen per year, age distribution, race/ethnicity, language, and payer mix, we used 2018 UDS data from HRSA (HRSA, undated-b). (See Table 1.2.) To obtain comparable data for Chapa-De Indian Health, we used a 2018 annual report (Chapa-De Indian Health, 2019).

Although participating health centers are generally representative of FQHCs in California on patient age distribution (30 percent of SMTSN health center patients and 32 percent of California FQHC patients are under age 18) and patient population covered by Medicaid (62 percent of SMTSN health center patients and 66 percent of California FQHC patients are covered by Medicaid), there are some notable differences. For example, SMTSN health centers serve a significantly higher proportion of white patients and English speakers (HRSA, undated-a; HRSA, undated-b).

Table 1.2. Health Center Patient Characteristics, 2018

Clinic Name	Total Patients[a]	Age	Race/Ethnicity[b]	Best Served in a Language Other Than English (%)	Payer Mix
Ampla Health	71,000	• 28% under 18 • 63% 18–64 • 10% 65 or older	• 46% white • 2% Black • 39% Hispanic/ Latinx[c] • 12% other	13	• 22% uninsured • 53% Medicaid/CHIP • 12% Medicare • 13% other third-party insurance
Borrego Health	229,000	• 36% under 18 • 57% 18–64 • 7% 65 or older	• 28% white • 5% Black • 64% Hispanic/ Latinx • 7% other	53	• 5% uninsured • 86% Medicaid/CHIP, • 2% Medicare • 6% other third-party insurance
Chapa-De Indian Health	17,000	• 25% under 18 • 55% 18–60 • 20% 60 or older	• 58% white • 7% Hispanic/Latinx • 33% other • 2% Unknown	Not reported	• 36% uninsured • 47% Medicaid/CHIP • 13% Medicare • 3% other third-party insurance
Clínicas de Salud del Pueblo	53,000	• 34% under 18 • 55% 18–64 • 11% 65 or older	• 8% white • 2% Black • 89% Hispanic/ Latinx • 10% other	34	• 16% uninsured • 65% Medicaid/CHIP • 10% Medicare • 8% other third-party insurance
El Dorado Community Health Centers	11,000	• 30% under 18 • 59% 18–64 • 11% 65 or older	• 70% white • 1% Black • 23% Hispanic/ Latinx • 9% other	12	• 7% uninsured • 70% Medicaid/CHIP • 16% Medicare • 7% other third-party insurance
Neighborhood Healthcare	66,000	• 30% under 18 • 64% 18–64 • 7% 65 or older	• 34% white • 3% Black • 57% Hispanic/ Latinx • 9% other	42	• 18% uninsured • 73% Medicaid/CHIP • 7% Medicare • 2% other third-party insurance
Open Door Community Health Centers	60,000	• 27% under 18 • 58% 18–64 • 15% 65 or older	• 80% white • 2% Black • 12% Hispanic/ Latinx • 7% other	6	• 3% uninsured • 51% Medicaid/CHIP • 18% Medicare • 27% other third-party insurance
Shasta Community Health Center	33,000	• 41% under 18 • 50% 18–64 • 9% 65 or older	• 77% white • 3% Black • 13% Hispanic/ Latinx • 8% other	4	• 10% uninsured • 65% Medicaid/CHIP • 17% Medicare • 7% other third-party insurance

Clinic Name	Total Patients[a]	Age	Race/Ethnicity[b]	Best Served in a Language Other Than English (%)	Payer Mix
West County Health Centers	12,000	• 21% under 18 • 60% 18–64 • 19% 65 or older	• 77% white • 1% Black • 16% Hispanic/Latinx • 8% other	7	• 9% uninsured • 48% Medicaid/CHIP • 19% Medicare • 24% other third-party insurance
Mean (across all participating clinics)	61,000	• 30% under 18 • 58% 18–64 • 12% 65 or older	• 53% white • 2% Black • 36% Hispanic/Latinx • 12% other	21	• 14% uninsured • 62% Medicaid/CHIP • 13% Medicare • 11% other third-party insurance

NOTE: With the exception of Chapa-De Indian Health, all data were obtained from the HRSA UDS (HRSA, undated-b). Chapa-De Indian Health data were obtained from a 2018 annual report (Chapa-De Indian Health, 2019). The breakdown of age and race/ethnicity data for Chapa-De differs from other health centers due to this difference in data source. CHIP = Children's Health Insurance Program.

[a] The UDS defines *patients* as unique individuals with at least one reportable visit during 2018 (HRSA, 2019). Chapa-De defines *patients* as unique individuals with at least one visit during 2018 (Chapa-De Indian Health, 2019). Numbers are rounded to the nearest thousand.

[b] The UDS collects data on Hispanic/Latino ethnicity regardless of race (HRSA, 2019). The percentages for race/ethnicity therefore do not sum to 100 percent. The "other" category is inclusive of Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, more than one race, and unknown.

[c] *Latinx* is a gender-neutral word for Latino/a (Salinas and Lozano, 2019) and refers here to people of Central American, Cuban, Mexican, Puerto Rican, South American, or other Spanish culture or origin.

Ampla Health

Ampla Health is a nonprofit network of 14 medical and six dental centers based in Yuba City, just north of Sacramento in Northern California. Established in Sutter County General Hospital in 1964 to serve migrant farm workers, the center became a nonprofit in 1973 and was renamed Ampla Health in 2011. Services now extend from Sutter and Yuba counties to include Butter, Colusa, and Glenn counties. In addition to the medical and pediatric services offered at 14 locations, Ampla offers nutrition, dental, chiropractic services, and psychotherapy (Ampla Health, undated).

Today, Ampla serves approximately 71,000 patients per year, most of whom identify as white (46 percent) or Latinx (39 percent) (HRSA, undated-b). Ampla continues to count migrant and seasonal farm workers among the patients seen across its medical and dental facilities (Ampla Health, undated). Most patients are served in English, although 13 percent are served in another language (HRSA, undated-b). Approximately half of Ampla patients (53 percent) are insured by Medicaid or CHIP, while 22 percent are uninsured, 12 percent are insured by Medicare, and 13 percent are covered through commercial insurance (see Table 1.2) (HRSA, undated-b).

Ampla has been offering telemedicine services for more than a decade, since 2003 (Center for Care Innovations, 2017). Types of telemedicine offered at the start of the initiative were psychiatry and diabetic retinopathy, both of which were offered through contracts with a third party.

Borrego Health

Borrego Health is based in Borrego Springs, approximately three hours southeast of Los Angeles and two hours northeast of San Diego in Southern California. Borrego Health is the largest FQHC in California (HRSA, undated-b) and has 23 sites in San Bernardino, Riverside, and San Diego counties, including medical and dental clinics, women's health centers, and wellness centers (Borrego Health, undated-a). The Borrego Community Health Foundation was established in 1995 (GuideStar, undated) and received funding from HRSA to expand in 2002 (Borrego Health, undated-a). In addition to primary care, behavioral health, pediatric care, dental services, women's health, and prenatal care, Borrego Health offers specialized services for veterans and lesbian, gay, bisexual, transgender, queer or questioning, intersex, and asexual/aromantic/agender (LGBTQIA) patients; offers chiropractic treatment at two clinic locations; and has four urgent care clinics. Borrego hosts community retail pharmacies in several locations and has lab services and digital radiology (Borrego Health, undated-b).

Borrego Health serves more than 200,000 patients per year, most of whom are Latinx (64 percent) (HRSA, undated-b). More than half of patients seen at Borrego Health clinics (53 percent) are best served in a language other than English (HRSA, undated-b). The majority of Borrego patients (86 percent) are insured by Medicaid or CHIP, 6 percent are insured through commercial insurance, 5 percent are uninsured, and 2 percent are insured by Medicare (see Table 1.2) (HRSA, undated-b).

Borrego Health has been offering telemedicine services since 2006 (Borrego Health, undated-a).

Chapa-De Indian Health

Chapa-De Indian Health was established in 1974 in Auburn, just northeast of Sacramento in Northern California. The clinic was opened in response to the publication of a report showing poor health outcomes and barriers in access to care for American Indians in California (Chapa-De Indian Health, undated). Chapa-De now functions as two freestanding nonprofit community health centers, with a second location in Grass Valley, 40 minutes north of Auburn. Contracting with the Indian Health Service, Chapa-De provides low- or no-cost care to American Indians and Alaska Natives and has begun accepting non-Native low-income individuals (Chapa-De Indian Health, undated).

Chapa-De sees 17,000 patients per year (HRSA, undated-b). An estimated 58 percent of Chapa-De patients identify as white, 29 percent as American Indian or Alaska Native, 7 percent as Hispanic/Latinx, and 6 percent as unknown or other race (HRSA, undated-b). Approximately half (47 percent) of patients are insured by Medicaid or CHIP, and a significant minority (36 percent) are uninsured (HRSA, undated-b). Thirteen percent of patients are insured by Medicare and 3 percent are covered through commercial insurance (see Table 1.2) (HRSA, undated-b).

Chapa-De began providing telemedicine services in 2016 (Center for Care Innovations, 2017).

Clínicas de Salud del Pueblo

Clínicas de Salud del Pueblo, Inc., is based in El Centro in Southern California, approximately two hours east of San Diego near the U.S. border with Mexico. Clínicas has 13 health center locations, including four dental clinics and two locations with full-service pharmacies. The health center has a community outreach team staffed by promotoras de salud, community health workers, and patient care coordinators, and offers medical exams for immigrants applying for U.S. permanent residency (Clínicas de Salud del Pueblo, undated-b).

The majority (89 percent) of the 53,000 patients served each year at Clínicas de Salud del Pueblo identify as Hispanic or Latinx (HRSA, undated-b). Clínicas serves 34 percent of its patients in a language other than English (HRSA, undated-b). Sixty-five percent of patients are insured by Medicaid or CHIP, while 16 percent are uninsured, 10 percent are insured by Medicare, and 8 percent are covered through commercial insurance (see Table 1.2) (HRSA, undated-b).

Clínicas de Salud del Pueblo has more than ten years of experience implementing telemedicine services, having started the program in approximately 2008 (Center for Care Innovations, 2017). In the year before the SMTSN initiative, Clínicas was averaging 120 diabetic retinopathy screenings per month across six clinics implementing the service and had hired a full-time telemedicine manager and site telemedicine coordinators (Vesper Society, 2016).

El Dorado Community Health Centers

El Dorado Community Health Centers is based in Placerville, about one hour east of Sacramento in Northern California. El Dorado is an FQHC with four primary and behavioral health care locations in Placerville and Cameron Park. The clinic was established in Placerville in 2003 as El Dorado Community Health Center by a grant that was co-written by the El Dorado County Public Health Department and Marshall Medical Center (Samrick, 2015).

In addition to primary and behavioral health care services, El Dorado offers dental care in Cameron Park and has an in-house pharmacy (El Dorado Community Health Centers, undated).

El Dorado serves 11,000 patients per year, of which the majority (70 percent) identify as white and 23 percent identify as Hispanic or Latinx (HRSA, undated-b). Most patients are served in English, although 12 percent are served in another language (HRSA, undated-b). The majority of patients (70 percent) are insured by Medicaid or CHIP; 16 percent are insured by Medicare, 7 percent are covered through commercial insurance, and 7 percent are uninsured (see Table 1.2) (HRSA, undated-b). El Dorado began providing telemedicine services in 2015.

Neighborhood Healthcare

Neighborhood Healthcare is based in Escondido, just north of San Diego in Southern California. The health center has 16 locations in San Diego and Riverside counties, including express care, family health, and prenatal clinics. In addition to primary and behavioral health care, Neighborhood offers in-house chiropractic, dentistry, pharmacy, laboratory, pediatrics, podiatry, acupuncture, and vision services (Neighborhood Healthcare, undated-b).

Of the 66,000 patients served by Neighborhood each year, more than half (57 percent) are Hispanic or Latinx, while 34 percent identify as white (HRSA, undated-b). An estimated 42 percent of patients are best served in a language other than English (HRSA, undated-b). The majority of patients (73 percent) are insured by Medicaid or CHIP, and 18 percent are uninsured. Seven percent of patients are insured by Medicare and 2 percent are covered through commercial insurance (see Table 1.2) (HRSA, undated-b).

Neighborhood began providing telemedicine services in 2012 (Center for Care Innovations, 2017). It began by offering telepsychiatry at its clinic location in Temecula and sought to expand to new clinic locations through the SMTSN initiative (Center for Care Innovations, 2017).

Open Door Community Health Centers

Open Door Community Health Centers is a network of 12 community health centers in Humboldt and Del Norte counties (Open Door Community Health Centers, undated-a). Opened as a single clinic in 1971 and granted FQHC status in 1999, Open Door is based in the coastal city of Arcata in Northern California, approximately two hours south of the state border with Oregon. Medical services are offered at 11 locations, and dental services are provided at three locations along with two school-based mobile dental van programs (Open Door Community Health Centers, undated-b).

Open Door offers primary care—including pediatric, prenatal, teen, and transgender services—and behavioral health and dental services. It has extended clinic hours at two of its locations to offer appointments at designated times on weekday evenings and weekends (Open Door Community Health Centers, undated-b). Specialty care is offered through telemedicine. Telemedicine offerings include dermatology, endocrinology, gastroenterology, infectious disease, neurology, nutrition, psychiatry, pulmonology, and rheumatology (Open Door Community Health Centers, undated-b).

Open Door Community Health Centers serves 60,000 patients per year (HRSA, undated-b). Most patients (80 percent) identify as white, and most (94 percent) are best served in English (HRSA, undated-b). Approximately half (51 percent) of Open Door patients are insured by Medicaid or CHIP, while 27 percent have commercial insurance, 18 percent are insured by Medicare, and 3 percent are uninsured (see Table 1.2) (HRSA, undated-b).

Open Door began implementing store-and-forward telemedicine for diabetic retinopathy in 1999 and expanded to offer other telemedicine services in 2004 (Center for Care Innovations,

2017). At the start of the SMTSN initiative, Open Door was offering telemedicine services at five of its 14 clinic locations (Center for Care Innovations, 2017).

Shasta Community Health Center

Shasta Community Health Center is based in Redding in Northern California, about midway between Sacramento and the border with Oregon. Shasta was founded in 1988 to provide primary care to residents of Shasta county and has six clinic locations, including primary care, dental care, maternity care, and neuropsychiatry clinics in Redding, and two health and dental centers in Anderson and Shasta Lake (Shasta Community Health Center, undated-a). Primary care services include transgender health and integrated substance use services, and Shasta offers urgent care (on weekday evenings and Saturday mornings) and conducts outreach to youth and to homeless and vulnerable members of the community (Shasta Community Health Center, undated-b).

Shasta Community Health Center serves 33,000 patients per year, most of whom (77 percent) are white (HRSA, undated-b). Most patients are served in English, although 4 percent are served in another language (HRSA, undated-b). More than half (65 percent) of Shasta patients are insured by Medicaid or CHIP, while 17 percent are insured by Medicare, 10 percent are uninsured, and 7 percent are covered through commercial insurance (see Table 1.2) (HRSA, undated-b).

Shasta has more than a decade of experience implementing telemedicine; it began its telemedicine program in 1999 (Center for Care Innovations, 2017). Shasta began by providing telepsychiatry through grant funding for patients with developmental disabilities and was offering additional specialties in the year before the SMTSN initiative, including neurology, dermatology, and endocrinology (Shasta Community Health Center, undated-c).

West County Health Centers

West County Health Centers, Inc., is based in Guerneville, two hours north of San Francisco in Northern California. West County was formed by the merging of two independent community health centers in 2000: Russian River Health Center, founded in Guerneville in 1974, and Occidental Area Health Center, opened in Occidental in 1976 (West County Health Centers, undated-a). West County comprises six clinical sites: three health centers, Russian River Health Center, Occidental Area Health Center, and a new community health center, which opened in Sebastopol in 2014; a dental clinic in Sebastopol; and a wellness center and a teen health clinic, both in Forestville (West County Health Centers, undated-a). The Russian River Health Center was destroyed by a fire in 2016 and is being replaced by a new community health and dental center in Guerneville, which was slated to open in March 2020 (Robertson, 2019).

West County offers primary and behavioral health care services, including obstetrics and perinatal care, reproductive health care, gender expansive services, individual psychotherapy, support groups, and drug and alcohol treatment (West County Health Centers, undated-b). Dental

care and wellness services (e.g., nutrition, naturopathic consultations) are offered in Sebastopol and Forestville, respectively (West County Health Centers, undated-a).

West County serves 12,000 patients per year. Most patients (77 percent) are white, while 16 percent are Hispanic or Latinx and 8 percent identify as another race or more than one race (HRSA, undated-b). Most patients are served in English, while 7 percent are served in another language (HRSA, undated-b). Approximately half (48 percent) of West County patients are insured by Medicaid or CHIP, while 24 percent are covered through commercial insurance, 19 percent have Medicare, and 9 percent are uninsured (see Table 1.2) (HRSA, undated-b).

West County began providing telemedicine services in approximately 2012 (Center for Care Innovations, 2017). In its first few years of implementing telemedicine, West County offered dermatology, psychiatry, rheumatology, and remote care management for patients insured through Medi-Cal and other public payers (Philip and Cosway, 2015).

Telemedicine Models

Participating heath centers offered a variety of services through telemedicine, although the most-common services were tele–mental health and diabetic retinopathy screening. In addition, telemedicine programs varied on several key dimensions, including the use of clinic providers versus third-party providers for telemedicine visits, the role of primary care providers (PCPs) in the referral process, and the parties involved in contracting. These sources of variation had implications for telemedicine workflow and reimbursement.

Use of Clinic Providers Versus Third-Party Providers to Deliver Telemedicine Visits

The majority of participating health centers contracted with third parties (typically a telemedicine vendor or independent group of specialists) for telemedicine services. In this model, the patient presents to the health center where they typically receive primary care and is connected to a remotely located specialist who is employed by an external organization.

In contrast, two participating health centers primarily used their own clinicians to provide telemedicine services. In this model, multisite health centers that employ specialists at certain locations (e.g., behavioral health staff) connect, via telemedicine, to underserved locations within the same organization.

Several of the participating health centers pursued both models. For example, two health centers contracted with telemedicine vendors for the majority of services; however, for tele-dentistry, they used their own clinicians to provide services.

According to health center staff, there are several advantages to using health center clinicians to provide telemedicine visits. First, this model can help ensure that all providers employed by the health center are working at full capacity (because salaried providers with availability can serve underserved clinic locations). Second, health centers do not have to engage in contracting or manage outside parties. Third, health center clinicians have complete access to patients'

medical records, which can improve continuity of care and a team-based approach. However, smaller health centers are less likely to employ specialists of any kind and might not have the option to use this model to increase access to specialty care. Also, in the case of live video visits, this model requires the use of physical space at two locations: where the clinician is sitting and where the patient is sitting. If there are space constraints, it might be more profitable to use this existing infrastructure for two in-person visits rather than one telemedicine visit.

Role of Primary Care Providers in the Referral Process

The role of the PCP in the referral process varied across health centers, with some having PCPs directly refer patients to telemedicine and others having a centralized referral coordinator determine which patients in need of specialty services should be referred to telemedicine. Patients served by health centers that offer telemedicine might have two or more options for specialty care, especially in cases in which health centers have specialists on staff. Several of the participating health centers had behavioral health staff who served patients in person and also offered tele-psychiatry services. As a result, a patient in need of psychiatry could be referred for an in-person visit with a psychiatrist employed by the health center or practicing in the community or could be referred to telemedicine. In cases in which there are no specialists on staff for a particular specialty (e.g., rheumatology), the options are more limited: The patient could be referred to telemedicine or to a rheumatologist practicing in the community (who might be located hours from the patient). The role of the PCP in deciding how to route patients to these options varied by health center. At some health centers, PCPs made the decision to refer patients to telemedicine versus in-person care, and this decision could be influenced by wait times and their general comfort and confidence in telemedicine. At other health centers, PCPs simply referred patients for specialty care, and the decision of how to route them (to telemedicine or in person) was made by a referral coordinator or patient services representative. In two of the seven health centers that used the medical application eConsults, the consulting specialist had a role in deciding whether the patient should be referred to telemedicine. One advantage of removing PCPs from the workflow is that variation in their attitudes about telemedicine would not be a factor in driving utilization. Although PCP support for telemedicine generally was high across participating health centers, some PCPs voiced reservations about these services.

Third-Party Contracting

The majority of participating health centers directly contracted with third parties, such as telemedicine vendors. In this model, the health center treats the telemedicine clinician as a member of its own staff and bills for visits on their behalf. Many health centers also offered telemedicine services that were covered by a contract between a health plan and a telemedicine vendor. When a health plan contracts with a telemedicine vendor directly, the health center can offer telemedicine visits to patients covered by that health plan, but it typically cannot bill unless a PCP sits in on the visit. Health center staff expressed some frustration with the health plan

contracting model. They felt that offering these services demanded staff time to navigate complex logistics but were not sustainable because of lack of reimbursement. Health centers using this model either did not bill for visits or expressed concerns that the opportunity cost of requiring PCP time was too high. Also, these telemedicine services were generally available only to patients with a particular health plan rather than to all clinic patients.

Evaluation Methods

To evaluate the experiences of the nine health centers that participated in the SMTSN initiative in expanding telemedicine, we conducted a mixed-methods formative and summative evaluation guided by the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Gaglio, Shoup, and Glasgow, 2013). Quantitative data sources included telemedicine volume data and health center progress report data. Qualitative data sources included interviews with telemedicine coordinators and health center clinicians conducted by telephone and at site visits, as well as focus groups with chief financial officers (CFOs). These data sources were used to explore the following research questions:[1]

1. What staffing, programmatic, and process changes were implemented to expand telemedicine during the initiative (RE-AIM implementation domain)?
2. What barriers did health centers face in expanding telemedicine (RE-AIM implementation domain)?
3. What was the impact of health center activities on telemedicine volume and realized access to telemedicine services (RE-AIM reach and effectiveness domains)?
4. Are high-volume telemedicine programs and dedicated telemedicine staff likely to be sustained in participating health centers, and what factors contribute to sustainability (RE-AIM maintenance domain)?

These research questions are addressed in this report. However, as part of the broader evaluation, the study team also produced three accompanying reports that provide more-practical guidance to support telemedicine implementation. The accompanying reports are

- *The Case for a Telemedicine Coordinator: Lessons Learned from the Sustainable Models of Telemedicine in the Safety Net Initiative* (Sousa et al., 2020)
- *Costs of Maintaining a High-Volume Telemedicine Program in Community Health Centers* (Zocchi et al., 2020)
- *Promising Practices for Telemedicine Implementation* (Palimaru et al., 2020).

Definition of Telemedicine

Although there are multiple definitions of telemedicine, for the purposes of this research, we focused on provider-to-patient telemedicine, in which a remotely located provider is directly

[1] Our research questions explored all RE-AIM domains with the exception of adoption. We did not address this domain because all participating health centers had already adopted telemedicine prior to the initiative.

engaged in the diagnosis and treatment of a patient by means of telecommunications technology. Modalities that we considered in-scope included synchronous live video telemedicine between a patient and provider and asynchronous store-and-forward telemedicine, in which patient data are stored and analyzed by a provider in a different location at a different time. There are a variety of telemedicine-related services that health centers might engage in that we did not consider in-scope. We excluded electronic consultations (e-consults) and Project ECHO (Project Extension for Community Healthcare Outcomes) because these services are provider-to-provider telemedicine services rather than provider-to-patient services. E-consults allow PCPs to seek advice from remotely located specialists, and Project ECHO links PCPs to specialists via video for mentoring purposes. We chose to focus on live video telemedicine between a patient and provider and asynchronous store-and-forward telemedicine in consultation with CHCF because these services are more likely to be reimbursed by payers than other forms of telemedicine, and the initiative was dedicated to the identification and improvement of sustainable models in safety-net settings.

Quantitative Data Sources and Analyses

Data Sources

Telemedicine volume data. Each health center participated in the initiative for a 24-month period that occurred between July 2017 and March 2020. For each month that health centers were active in the initiative, they submitted data on every telemedicine visit that occurred. The following visit characteristics were captured: the date a visit was requested, whether it was a new or follow-up visit, actual visit date, visit status (e.g., no-show, canceled, completed), telemedicine specialty, and payer. In addition, clinics submitted aggregate data on total visits completed each month in the three months prior to their entry into the initiative.

Health center progress report data. Each health center submitted two progress reports to the study team over the 24-month implementation period (one at 12 months and one at 24 months). Progress report templates were designed by the study team and included open-ended and closed-ended questions on telemedicine utilization, activities undertaken to increase telemedicine volume, and roles and responsibilities of dedicated telemedicine staff. Health centers were asked to report the proportion of all clinic patients (with encounters of any kind) who participated in one or more telemedicine visits in the prior six months. They also were asked to report the demographics (e.g., age, gender, race/ethnicity) of patients with one or more telemedicine visits in the prior six months and the demographics of all clinic patients with any type of encounter in the prior six months. These data were used to understand the reach of each health center's telemedicine program and how representative patients served by telemedicine were of the general patient population.

Statistical Analyses

Telemedicine volume data. We first calculated descriptive statistics. We plotted the telemedicine volume data to assess changes in monthly volumes visually. Average monthly telemedicine volumes pre- and postintervention at each site and overall were compared using *t*-tests. Data for 6 percent of the clinic months (between zero and 3 months of 24 months for each health center) were missing at the time of analysis. Most missing months occurred at the beginning of the initiative.

To assess whether the SMTSN initiative changed the volume of telemedicine visits, we used an interrupted time series (ITS) design. The ITS allowed us to compare the trend in telemedicine visits for each clinic prior to and after the initiative. ITS is a useful study design for evaluating the effectiveness of an intervention that is implemented at a clearly defined point in time (Bernal, Cummins, and Gasparrini, 2017). The intervention—or, in this case, the SMTSN initiative—is expected to "interrupt" or change the level and/or time trend. In this way, the ITS design allows each health center to serve as its own control, such that each health center's preintervention period can be used to create a counterfactual. The counterfactual should reflect the level of telemedicine visits we would have expected for each health center without the intervention. We used reported volume data from all nine health centers, but because sites did not begin the initiative at the same time, we rescaled calendar months so that they are relative to the implementation month. Statistical analyses were conducted using itsa, a program written for Stata to conduct ITS analyses.

Although the ITS design is useful in cases in which randomization is not possible, we note several caveats. The ITS approach relies on the assumption that the preintervention trend in telemedicine visits would not have changed because of other secular trends (e.g., changes in telehealth payment policies, changes in demand for telehealth) (Kontopantelis et al., 2015). Ideally, our analysis would include a comparison or control group of statistically similar health centers and patient populations, which would allow us to adjust for broader secular trends in telemedicine that are not reflected in the preintervention trends of the study health centers. In addition, if there were changes over time in the characteristics of the health center or patient population, those changes could explain any observable changes in volume. For these reasons, our analysis is necessarily exploratory and does not allow us to establish causal evidence on the effect of the intervention on telemedicine volume. Health centers provided aggregate data on all completed telemedicine visits in the three months prior to their entry into the initiative. These data were used to determine a baseline trend in telemedicine volume. Health centers also provided detailed data on each telemedicine visit that occurred during the implementation period, but they did not begin submitting detailed data reports until October 2017. As a result, the first health center that entered the initiative in July 2017 did not submit detailed data covering its first three months of implementation. In addition, most health centers did not submit detailed visit data for their first implementation month, and two sites had not completed all 24 months of the initiative by the time of this writing. We used all available data (6 percent of the clinic months

were missing) for descriptive analyses. For the ITS analysis, we removed the first three implementation months from all sites (beginning with the month of implementation) and imputed the two months for two health centers to achieve a balanced panel across all participating health centers.

Health center progress report data. We compared patients served by telemedicine with the general population of patients, as reported by each health center in its second progress report and as reported to (and made publicly available by) HRSA as part of UDS reporting requirements (HRSA, undated-b). UDS is a standardized reporting system that provides information on the performance of all FQHCs and look-alikes that receive HRSA funding each year. We produced tables of descriptive statistics of key measures, comparing proportions across the two data sets using chi-square tests.

Qualitative Data Sources and Analyses

Site Visit Data

Two members of the study team conducted one-day site visits with each participating health center from June 2019 to December 2019. During site visits, we conducted (1) a semi-structured interview with dedicated telemedicine staff; (2) two to four semi-structured interviews with health center health care providers who were involved in the telemedicine program (e.g., providers who delivered care via telemedicine and/or referred patients to telemedicine); (3) a site tour; and (4) a semi-structured interview with the CFO.

To guide data collection, we developed site-visit protocols that included elements designed to assess and address implementation and evaluation issues. Specifically, the elements were a discussion of project planning and implementation activities; a review of project goals and updates on progress toward achieving those goals; an observation of telemedicine workflow, space, and equipment; and a collection of input from staff. Telemedicine coordinators planned the site-visit schedule following guidance from the study team and they selected the health care providers to participate in interviews.

Interview protocols aligned with our research questions and with the RE-AIM framework. From providers and other health center staff, we elicited ideas about whether and how new procedures to expand telemedicine were being conducted, perceptions of barriers to and facilitators of telemedicine, perceptions of and experiences with the SMTSN initiative, and perceptions of program sustainability. Site-visit interviews were recorded and transcribed.

Using Dedoose qualitative research software, study team members read all transcripts to identify themes (e.g., key barriers, facilitators, sustainability) and looked for repetitions of themes across interviews and settings. In identifying themes, we employed inductive and deductive analytic approaches, including both RE-AIM–related themes from interview guides and new themes that emerged. After independently coding a subset of transcripts, team members developed an initial list of major themes and a codebook accompanied by a detailed description,

inclusion and exclusion criteria, and typical examples. Each transcript was then coded by at least two team members. We present qualitative data as lists of themes with illustrative quotes as examples of key concepts.

Focus Groups with Chief Financial Officers

In February 2019, we conducted two web-based focus groups with CFOs and several other senior leaders from participating health centers. The goal of these focus groups was to explore leaders' perceptions of the sustainability of their telemedicine programs, given that leaders (rather than dedicated telemedicine staff) are in a position to make decisions about the future of these programs and their staffing.

We defined *sustainability* at the outset of the focus groups as continuing program activities within an organization, often termed *institutionalization*. Next, we presented the initiative's sustainability goal: Two years after the end of the initiative, health centers will have maintained or surpassed the telemedicine volume achieved at the end of the initiative. Finally, we posed questions on the following topics:

- perceptions of the benefits and drawbacks of telemedicine
- the financial impact of telemedicine
- the role of the initiative in growing telemedicine programs
- whether the sustainability goal was feasible
- plans for telemedicine programs going forward and factors (e.g., policy changes) that could affect sustainability
- plans for staffing telemedicine programs after the initiative ends.

Seven of the nine health centers participating in the initiative were represented in the focus groups. Focus groups lasted for 90 minutes and were recorded and transcribed. We reviewed transcripts and identified themes using the approach described earlier for the site visit data.

2. Staffing, Programmatic, and Process Changes Implemented to Expand Telemedicine During the Initiative

Health centers pursued a variety of staffing, programmatic, and process changes to improve telemedicine workflow during the SMTSN initiative. Because of the flexibility built into the SMTSN initiative's grant funding, health center implementation plans were fluid: At multiple points during the implementation period, health centers developed, executed, and modified plans to add dedicated staff, add telemedicine services, serve additional clinic locations, create and standardize workflows, develop trainings, and promote telemedicine among staff.

Staffing Changes

The CHCF provided funding to health centers to hire and retain dedicated telemedicine staff. However, health centers were given flexibility in who they hired and what specific roles staff members filled. Six health centers used the funding to hire one or more telemedicine coordinators. These coordinators typically were embedded in larger telemedicine departments that included health center leaders and support staff (e.g., telemedicine medical assistants [MAs]). Three health centers hired other telemedicine staff, including a telemedicine coordinator assistant, telemedicine technicians, and a telemedicine MA. The size of the telemedicine departments in participating health centers ranged from two to 14 individuals, including both full-time and part-time staff.

Programmatic Changes

During the initiative, the most-common approaches to expanding telemedicine volume were to add new service lines, contract with new vendors and/or purchase additional blocks of time with existing vendors, begin offering telemedicine services at new clinic locations, and purchase new equipment. The majority of participating health centers reported adding services to telemedicine programs that were once more limited in scope. They tended to prioritize new services where there was a demonstrated patient need (e.g., long wait times to see a particular specialist practicing in the community). Examples of new offerings included tele-dentistry; tele-medication–assisted treatment for patients with opioid use disorder; tele-therapy; tele–family practice; tele-perinatology; and tele-gastroenterology, tele-immunology, and diabetic retinopathy screenings. One health center experimented with new contracting models, adding vendors that it contracted with directly. Another renegotiated an existing contract to allow the health center to pay the contracted specialist by completed appointment rather than by hour. This new

contracting model reduced the financial risk to the health center, which previously had to absorb the cost of missed appointments (i.e., no-shows).

Several health centers reported extending telemedicine services to new clinic locations that did not have access to telemedicine prior to the initiative because of lack of equipment or insufficient staffing. These expansions allowed health centers to not only increase telemedicine volume but also reach new populations of patients. Also, several health centers reported upgrading older telemedicine equipment and/or purchasing new equipment, including telemedicine carts and cameras, to support expansion.

Process Changes

Many health centers aimed to make telemedicine visits more efficient and increase utilization by improving workflow, training and retraining staff, and promoting telemedicine across the organization. For example, one health center that used its own clinicians to provide telemedicine services implemented a process to ensure that telemedicine equipment was being used by only one clinician at a time, thereby eliminating a problem with double-booking. This same health center reported standardizing workflows across sites and producing training materials to cover how to operate equipment and how to schedule telemedicine visits. Another health center implemented a new referral process for behavioral health that improved the screening process and helped identify new patients that could benefit from telemedicine.

One health center reported standardizing workflows across sites, updating policies and procedures, and creating a telemedicine dashboard to monitor the accuracy of scheduled appointments for tracking and billing purposes. The telemedicine coordinator explained that the new dashboard was helpful in "monitoring a high volume of visits versus manually having to look up each appointment one by one to see if it was correctly set up" and that the dashboard "allowed for automation to identify 'misfits' that don't have each of the defining fields entered properly."

Several health centers took steps to reduce the no-show rate and, therefore, recover more costs associated with offering telemedicine. One telemedicine coordinator reported calling patients multiple times per week until she reached them to confirm appointments. This same health center created a telemedicine-specific phone number for patients to call to confirm their appointments and ask questions about the upcoming visit. A representative from a different health center mentioned using "firmer" language in confirmation calls, thereby encouraging patients to keep their appointments.

To promote telemedicine, one health center reported conducting extensive outreach with clinicians by presenting at meetings, producing newsletters, and providing small gifts or incentives (e.g., candy). Its telemedicine staff also would meet with clinicians one-on-one to discuss barriers and successes and encourage communication. This same health center provided a telemedicine orientation to all new MAs that were hired into the organization.

Attitudes of Health Center Providers Toward Telemedicine

We also documented the reactions of health center providers to the various efforts to expand telemedicine volume in their health centers. These attitudes can be critical to program success. During site visits, we interviewed dozens of providers, including PCPs who directly referred patients to telemedicine, PCPs who did not refer patients but were tasked with introducing the option of telemedicine to patients, and on-staff specialists who provided telemedicine visits. We also asked telemedicine coordinators about their experiences with providers. The major themes that emerged from those interviews are described in the following sections.

Positive Attitudes About Telemedicine

PCPs across all health centers expressed positive views of telemedicine. They appreciated that telemedicine expedited access to specialty care and improved the quality of care. They frequently mentioned getting positive feedback from patients about telemedicine, which encouraged them to continue offering it. One provider said,

> [Patients will] come down to see me and then they'll have issues with transportation or something's going on where they have multiple appointments. And I'll have this great fix and tell them, "you know, you could see me through telemedicine" and they're overjoyed . . . to not have to drive and save money on gas and all these things. I think it is a great convenience in that regard. Most people have enjoyed telemedicine.

Another provider commented that she liked the telemedicine equipment and set-up and felt that it served her needs well:

> The things I really liked about it was one, the ability to control the camera at the distant site so I could actually scan the room, I could zoom in on things, zoom out [which is] much better than trying to use something like Skype or something where you can't really do those things as well. So that was really good.

Provider Knowledge About Implementation

Knowledge about telemedicine within the health center (i.e., how it works in practice, who can benefit from it, when to refer patients to telemedicine, and what the workflow steps are) was a driver of provider buy-in across most health centers. At one health center, the telemedicine coordinator noted that provider buy-in for tele-dermatology likely was influenced by a lack of knowledge about aspects of the workflow:

> For dermatology, I have not had as much [of] a response; some clinicians are all for it, some are not. The idea with dermatology [is that] there are ways to communicate with the specialist by phone. Email or by phone . . . the telemedicine doctors have to be available for a call if needed. So, I guess it just wasn't public knowledge that you are able to reach out to them and actually get more clarification or more discussion.

When knowledge of telemedicine among providers was more limited, resistance to telemedicine tended to be more pronounced. As one coordinator described,

> One can never stop communicating or cut communications short, whether with patients, staff, or providers. When we do, we see an immediate impact in terms of buy-in, understanding, remembering the program exists, no-show rates, etc. This includes regular follow-up communications at provider meetings, huddles, phone calls to patients, [and] calls to payers.

To overcome knowledge gaps and resistance among providers, some health centers discussed the need for ongoing education. One chief clinical services officer explained that, "because we have people coming and going, some of our own employees don't even know we have a program available, so we need to keep up that marketing."

Provider Preferences Regarding Patient Visits

Some clinicians who provided both in-person and telemedicine visits valued telemedicine but still preferred to have in-person visits. Several providers pointed out that older providers were more likely to prefer in-person visits. One provider who was supportive of telemedicine explained, "I'm also younger. I feel like a lot of old-school psychology providers are a little bit more like, 'No, I need to sit in the office. I need to do this.'"

Some providers recommended that health centers mandate a certain number of in-person visits for patients who are predominantly seen via telemedicine. One provider explained, "I do like the in-person visits. I would prefer if we mandated that each patient has to see us at least once a year, twice a year, in person. Then they can do the rest through telemedicine or something like that, because there are several observations that are really hard to do through telemedicine."

3. Barriers Experienced in Expanding Telemedicine

Interviews with telemedicine coordinators, providers, and CFOs explored the barriers that health centers faced in expanding telemedicine. Participating health centers confronted numerous barriers, many of which have been documented in prior research (Uscher-Pines et al., 2019). Some of these barriers were not new to health centers that had prior experience with telemedicine; other barriers were not anticipated and directly affected health centers' ability to meet their goals with telemedicine volume. The most-common barriers to growing telemedicine volume within established programs included variable and insufficient reimbursement, technical difficulties, staffing challenges, insufficient physical space, and challenges working with remote specialists.

Variable and Insufficient Reimbursement

Nearly all health centers reported lack of reimbursement as the dominant barrier to growing their telemedicine programs. Even though most health centers were pursuing telemedicine services that theoretically could be reimbursed and avoiding those that could not (e.g., telemedicine in the home, which was not covered by Medi-Cal until 2019), during the initiative, many health centers were being reimbursed for only a subset of their telemedicine visits. Interviewees also pointed out that insufficient reimbursement for telemedicine was a threat to program sustainability.

The ideal reimbursement rate for an encounter at these health centers is the prospective payment system (PPS) rate because it is a code-based fixed per-visit payment, regardless of the length or intensity of the service provided. Federal law requires that FQHCs receive reimbursement equal to their PPS rate for in-person visits by patients insured with Medicaid, and the state provides wrap-around payments to supplement any payment by Medicaid managed care organizations that amounts to less than the PPS rate for qualified visits. Health centers in California received an average reimbursement per visit of $165 in 2019 (California Department of Health Care Services, 2018).

The fixed nature of PPS rates means that health centers can estimate costs and payments more accurately. PPS rates are determined differently for Medicaid and Medicare patients: Medicaid rates are specific to a health center's location, while Medicare rates are the same across health centers. Medicaid PPS rates are higher on average than Medicare rates in California (Capital Link, 2013; Capital Link, 2019). Three health centers reported that they were not getting their PPS rate for any of their telemedicine visits. For these health centers, the health plan contracted with the telemedicine vendor on their behalf, and they did not have a PCP sit in on the visit. Others received their PPS rate for a subset of visits, with reimbursement amounts for other

visits varying by payer, by specialty, by telemedicine model (e.g., health plan contracts on behalf of health center versus health center contracts directly), and by clinic location. For example, one participating health center could get its PPS rate for live video telemedicine visits with Medicaid patients, $25 for sliding fee patients, and some rate below the PPS rate for commercially insured patients, depending on the payer. It could get reimbursed only for telemedicine with Medicare patients in one (rural) site in its network of clinics because of originating site restrictions in Medicare.

Only one health center reported having a telemedicine program that was not losing money. However, this health center depended on grant funding and reimbursement and received its PPS rate for about two-thirds of telemedicine visits. The one-third of visits that were not billable included all visits with Medicare patients and dual-eligible (i.e., Medicaid and Medicare) patients. In addition, this health center did not receive its PPS rate for visits provided under a contract between a health plan and vendor or for visits with providers who were not credentialed. One successful strategy this health center used was to negotiate a contract with a private practice so that the health center was charged by the visit rather than by the hour. According to the telemedicine coordinator, this is the most sustainable contracting model because the telemedicine provider and health center share the no-show risk.

Insufficient reimbursement can be attributed to several factors. At the time of data collection, there were many cases in which the health center could not be reimbursed because of regulatory constraints and reimbursement policy. For example, prior to the coronavirus disease 2019 (COVID-19) pandemic, health centers serving as originating sites in urban areas could not bill for telemedicine visits with Medicare patients, and health centers could not serve as distant sites in the Medicare program. However, we also identified situations where there was misinformation about which services were billable and where health centers were not maximizing the amount of money they could obtain in reimbursements. One health center, for example, reported hearing conflicting information on whether it could bill for diabetic retinopathy screening with Medicaid patients, so leadership took the conservative approach of not attempting to bill. The CFO explained that, given the low volume for a specific telemedicine service, it was not worth the risk of billing and then confronting issues during the reconciliation process and/or having the PPS rate affected.

A common point of confusion among both urban and rural health centers was whether health centers could bill Medicare as originating sites for telemedicine visits. At the time of data collection, health centers could bill Medicare if they meet the Centers for Medicare and Medicaid Services (CMS) definition of *rural* (Rural Health Information Hub, undated). However, some health centers reported not billing Medicare regardless of location because of confusion regarding the status of FQHCs in the Medicare program.

Staffing Challenges

Health centers in underserved areas routinely experience staffing challenges, but several health centers pointed out that staffing for telemedicine programs was uniquely difficult. Problems included insufficient or poorly trained support staff, staff turnover, limited staff availability (e.g., having only part-time staff in key roles), and competing demands (e.g., telemedicine staff needing to serve multiple sites). Turnover, which led to temporary vacancies and lack of continuity, was a significant issue affecting administrative and clinical support roles, such as telemedicine assistants or technicians, MAs, and call center staff. These disruptions were perceived to undermine telemedicine workflows and restrict patient volume. One telemedicine coordinator described how not having enough staff to assist with pediatric tele-dentistry visits meant that the visits often resulted in no useful images that could be forwarded to a clinician for interpretation. To address this issue, they expanded staff roles from other departments. The coordinator described,

> You don't get your picture as you need, and then you write up in your note "unable to get a photo." Well, you can only do that so many times, and pretty soon somebody's going to think that's kind of fraudulent. So now we're going to have to pool our resources, bring [other staff] over here to assist a couple days a week so that we can really expand the program. Now that's going to take a little bit maybe from diabetic retinopathy or it might take away from tele-derm[atology]. . . . Losing that is going to be pretty tough on us. We really need that extra person, especially since we're trying to work on our accreditation.

A provider described how, at health centers without significant experience with behavioral health prior to telemedicine implementation, support staff were insufficiently trained in tele–mental health workflows, which affected efficiency:

> [MAs] need to know how to scan immediately, link you to this, link you to that, go in the room, get consent, because you're not there live to sign for the consent as a witness so they need to go in and you talk about the medication, the side effects and the parent needs to [give their consent] and then the MAs sign. So sometimes if they're not trained or they're very superficially trained it can make things very chaotic.

Training support staff on telemedicine workflows and protocols for store-and-forward modalities, such as retinal screenings, tele-dermatology, and tele-dentistry, represented a notable financial and time investment for some health centers. These health centers developed several strategies to improve training. One health center trained and empowered its telemedicine coordinator to train other staff members to obviate the need for vendor-provided training. Another health center cross-trained MAs who were not directly involved in the telemedicine program to provide extra assistance with telemedicine as needed across clinic locations. As a provider explained,

> The MAs are quasi cross-trained for telemedicine, just so they can connect in a room simply with a Zoom connection ID that's set up by our IT

> department. . . . One of our facilities that's in the mountains, they don't have enough telemedicine volume to have a coordinator. So the medical assistants are all cross-trained, [and] we process the records for them.

Technical Difficulties

Several health centers reported experiencing technical difficulties caused by unreliable broadband and/or malfunctioning telemedicine equipment (e.g., computers that were slow to start, audio or speaker problems). These challenges resulted in dropped video calls, poor image quality, and buffering. On occasion, these issues originated with the vendor rather than the health center. One provider described that "it's usually on the opposite end, on the connecting end, where the specialist has trouble with their modem, or their server, or their low bandwidth. So we're fortunate that way."

To troubleshoot technical difficulties, several health centers reported relying on MAs who stepped in and resolved problems as needed. Sometimes MAs received a phone call from the telemedicine provider indicating a need for support. Alternatively, patients often opened the door and called out for the MA. As one telemedicine technician explained, "Most of the time, the physician is on it and will notify us right away as soon as an issue [is] occurring and we'll step in."

Insufficient Physical Space

Telemedicine programs within health centers require physical space to function, and busy health centers might be using all available space for in-person visits and operating with very little extra capacity. Physical spaces that are typically needed include dedicated exam rooms for each type of telemedicine encounter, office space for support staff and providers, and waiting room space for patients. Insufficient physical space emerged as a barrier across multiple health centers. One health center with limited space reported storing telemedicine equipment for multiple types of services in one room, which limited their ability to maximize visits for both tele-psychiatry and diabetic retinopathy screenings.

For some health centers, challenges with finding and dedicating physical space for telemedicine visits were inextricably linked to other ongoing challenges, such as reimbursement and staffing. Space was especially problematic for health centers that used their own clinicians to provide telemedicine visits because two rooms had to be allocated for each visit (one room for the patient, located in one site, and another room for the in-house provider, located at another site). As one telemedicine coordinator explained,

> I think from an operational standpoint, space is a big one, even though it's become more ubiquitous since the original vision where we had to have a whole health center site dedicated. . . . We have to have space, we have to have exam rooms, we have to have medical support staff, and then you couple that with the fact that a lot of the services aren't billable under specific insurance types or

> Medicare and so it becomes really challenging to expand on that. Especially since space is a premium with us.

Challenges Working with Remote Specialists

Several of the health centers reported challenges working with remote specialists who were employed by telemedicine vendors or in private practice. A couple of the health centers that did not achieve sustained volume growth during the initiative pointed to issues with vendors as the leading cause. For example, certain remote specialists quit unexpectedly, leaving significant unmet demand for services. As one provider explained, "Telepsychiatry was our most productive telemedicine service and the loss of this service became the primary driver of our low numbers." When remote specialists departed, it often took health centers many months to recruit and credential new specialists. In other cases, remote specialists altered their schedules or reduced their hours unexpectedly (e.g., for vacation). As one telemedicine coordinator summarized, "The number of telemedicine encounters that we complete each month is completely dependent on the availability of our telemedicine specialists."

In several cases, vendors suddenly decided that they could no longer serve certain populations of patients. In one case, a telemedicine specialty group had agreed to pilot a billing model with commercial insurance but later dropped the pilot because it was considered financially unsustainable.

4. Impact of Health Center Activities on Telemedicine Volume and Realized Access to Telemedicine Services

The goal of the initiative was to support participating health centers in increasing telemedicine volume. Although health centers set their own targets for monthly volume, CHCF defined success as achieving sustained growth in telemedicine visits. To determine the effectiveness of health center efforts to expand their telemedicine programs, we explored whether volume increases over the course of the initiative represented a significant increase over baseline trends. Although we expected that the presence of a telemedicine coordinator would result in increases in telemedicine visits, we did not predict a particular pattern of growth over time because of the variation in implementation plans and goals, staffing models, and prior experience with telemedicine across health centers. In addition to volume changes, we also examined characteristics of the population served by telemedicine and how representative those characteristics were of the wider health center population.

Types and Status of Telemedicine Visits

Health centers submitted data on all *scheduled* telemedicine visits that occurred during the initiative, regardless of outcome. In total, there were 74,830 scheduled and 53,135 completed visits across the nine health centers during the study period.

Table 4.1 shows the status and types of telemedicine visits scheduled during the 24-month initiative across all participating health centers. Nearly 60 percent of the telemedicine visits were follow-up appointments, whereas 36 percent were for new patients. Of all visits scheduled, 71 percent were completed, and 24 percent were either no-shows or cancellations.

Table 4.1. Telemedicine Visit Status

	Number	Percentage
Type of appointment scheduled[a]		
New or initial	21,985	35.9
Follow-up	36,533	59.7
Unknown or missing	2,721	4.4
Total telemedicine visits scheduled	61,239	
Result of appointment		
Completed	53,135	71.0
Rescheduled	3,373	4.5
Canceled	7,621	10.2
No-show	10,455	14.0
Incomplete or left without treatment	87	0.1
Unknown or missing	159	0.2
Total telemedicine visits scheduled	74,830	

[a] Eight of nine health centers reported the type of appointment scheduled.

Health centers offered a variety of telemedicine services. Table 4.2 shows completed telemedicine visits across all health centers stratified by provider specialty. The most common telemedicine visit was with a behavioral health provider (48.3 percent), followed by an ophthalmologist or optometrist (26.3 percent). All nine health centers offered tele–mental health services (typically psychiatry), and eight health centers had tele-ophthalmology (typically diabetic retinopathy screening). Other common specialists providing telemedicine visits included endocrinologists (seven health centers), rheumatologists (six health centers), and dermatologists (six health centers).

Table 4.2. Completed Telemedicine Visits, by Specialty

Specialty	Completed Visits		Total Health Centers with Specialty
	Number	Percentage	
Psychiatrist or behavioral health specialist[a]	25,688	48.3	9
Ophthalmologist or optometrist	14,000	26.3	8
Pediatric psychiatrist or behavioral health specialist	2,437	4.6	3
Neurologist	2,366	4.5	4
Endocrinologist	2,130	4.0	7
Dentist	1,990	3.7	3
Rheumatologist	1,607	3.0	6
Dermatologist	876	1.6	6
Nutritionist	590	1.1	1
PCP	390	0.7	2
Infectious disease specialist	203	0.4	4
Nephrologist	193	0.4	2
Gastroenterologist	94	0.2	2
Pulmonologist	83	0.2	1
Transgender care	34	0.1	2
Other	8	0.0	3
Pain specialist	7	0.0	1
Allergist or immunologist	5	0.0	1
Urologist	1	0.0	1
Unknown or missing	433	0.8	5
Total visits	**53,135**	**100.0**	

[a] Medication-assisted treatment is included within the behavioral health category.

Health centers reported the number and proportion of total health center patients with any kind of telemedicine visit in the prior six months in their final progress reports. They also reported the patient demographics (e.g., age, race, gender) for all health center patients and telemedicine patients. These data were used to assess the representativeness of patients receiving telemedicine services. Health centers reported that between 1 and 9 percent (median: 3 percent) of all patients had at least one telemedicine visit in the final six months of the initiative. It should be noted that participating health centers provide primary care, and telemedicine was implemented to increase access to specialty care. Only a subset of patients seen during the final six months of the initiative required visits with one or more specialists (i.e., would have demand for the particular telemedicine services offered by each health center.) The uptake rate presented here should be interpreted with this consideration in mind.

Overall, 3.1 percent of all health center encounters over the six-month period were telemedicine visits for specialty care (Table 4.3). Individuals younger than age 18 were less

likely to participate in telemedicine visits relative to in-person visits (16 percent versus 23 percent; $p < 0.001$). White patients participated in 43 percent of telemedicine visits despite accounting for 30 percent of total visits ($p < 0.001$). Latinos were underserved by telemedicine; Latinos participated in 42 percent of total visits and only 32 percent of telemedicine visits ($p < 0.001$). Differences in utilization by race could be driven by differences in patient need for the particular specialty services offered at each health center, patient preferences, and/or differences in payers (i.e., telemedicine was offered only to patients with certain health plans in some clinics).

Table 4.3. All Clinic Visits and Telemedicine Visits, by Patient Demographics

	All Visits		Telemedicine Visits		
	Number	**Percentage**	**Number**	**Percentage**	***p*-value**
All visits[a]	344,861	N/A	10,562	3.1	-
Patient age					
Younger than 18	77,086	22.5	1,210	16.1	< 0.001
18–30	55,336	16.1	931	12.4	
31–51	89,119	26.0	2,279	30.3	
51–64	76,290	22.2	2,346	31.2	
Older than 64	45,470	13.2	751	10.0	
Total	343,301		7,517		
Patient gender					
Female	153,230	44.7	4,337	57.7	< 0.001
Male	189,864	55.3	3,176	42.3	
Total	343,094		7,513		
Patient race/ethnicity					
White	103,168	29.9	3,237	43.1	< 0.001
Black	8,223	2.4	182	2.4	
Latino	145,955	42.2	2,402	31.9	
Other	88,264	25.5	1,697	22.6	
Total	345,610		7,518		

[a] This value reflects all patient volume in the previous six months, as reported on final progress reports at all nine health centers. For patient age, gender, and race, seven of nine sites reported these data.

Medicaid was the payer for 70 percent of all scheduled telemedicine visits during the initiative, and participating health centers reported that 70 percent of their patient population was made up of Medicaid patients in 2018 (HRSA, undated-b). However, fewer uninsured patients and patients with other third-party insurance, including commercial insurance, participated in telemedicine visits. Uninsured or self-pay patients were involved in 6 percent of scheduled

telemedicine visits during the initiative, yet uninsured patients represented 12 percent of all health center patients in 2018 ($p < 0.001$) (Table 4.4).

Table 4.4. Payer for Telemedicine Visits Compared with Overall Payer Mix

	All Visits Reported to HRSA and UDS, 2018		Telemedicine Visits	
Payer	**Number**	**Percentage**	**Number**	**Percentage**
Medicaid	433,451	70.4	47,284	64.8
Medicare	53,310	8.7	12,836	17.6
Other third-party insurance	58,588	9.5	3,015	4.1
Uninsured	70,536	11.5	4,161	5.7
Unknown or missing	-	-	5,663	7.8
Total visits	**615,885**		**72,959**	

NOTE: Overall patient population numbers were obtained from publicly available UDS data (HRSA, undated-b). The telemedicine visit total includes data from eight of the nine health centers. Chi-square *p*-value < 0.001.

Telemedicine Volume Trends

Most health centers in the initiative (eight of nine) experienced a statistically significant increase in telemedicine volume over the 24-month implementation period (Table 4.5). Among those health centers, changes in volumes ranged from an increase of about 35 visits to 200 visits on average per month. One health center experienced a decline of about 15 telemedicine visits per month, but this was not a statistically significant change. On average, prior to the initiative, health centers had 153 telemedicine visits per month. This increased to an average of 239 visits per month after the initiative, which represents a 56-percent increase. The two health centers that experienced the most growth increased average monthly visit volume by 160 percent and 196 percent, respectively. One health center experienced a decline in visit volume, and one grew by only 13 percent.

Table 4.5. Changes in Monthly Telemedicine Volumes at Each Site Over the Implementation Period, Pre- and Postintervention

Health Center Number	Preinitiative Monthly Average	Postinitiative Monthly Average	Change in Volume: Number of Visits	Change in Volume: Percentage Change
1	102.3	200	97.7***	95.5
2	167	241.3	74.3***	44.5
3	102.3	302.4	200.1***	195.6
4	50.7	85.1	34.5***	67.9
5	64.3	49.7	-14.6	-22.7
6	286	470.3	184.3***	64.4
7	53	137.8	84.8*	160.0
8	512.7	580.6	67.9	13.2
9	34.3	79.9	45.5***	132.9
Mean	152.5	238.6	86.1*	56.4

NOTE: The postintervention monthly average does not include the first three months of the intervention. Two sites (three and seven) did not report data for the last two months of the intervention. For these sites and months only, we imputed data using a prior three-month moving average. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Comparing preinitiative telemedicine volume with the final three months of each health center's implementation period also shows significant increases in telemedicine volume (see Table 4.6). Four of the nine health centers more than doubled telemedicine volume over preinitiative levels. One health center nearly increased volume threefold (282 percent) from preinitiative levels.

Table 4.6. Changes in Monthly Telemedicine Volumes at Each Site in the Final Three Months of the Implementation Period, Pre- and Postintervention

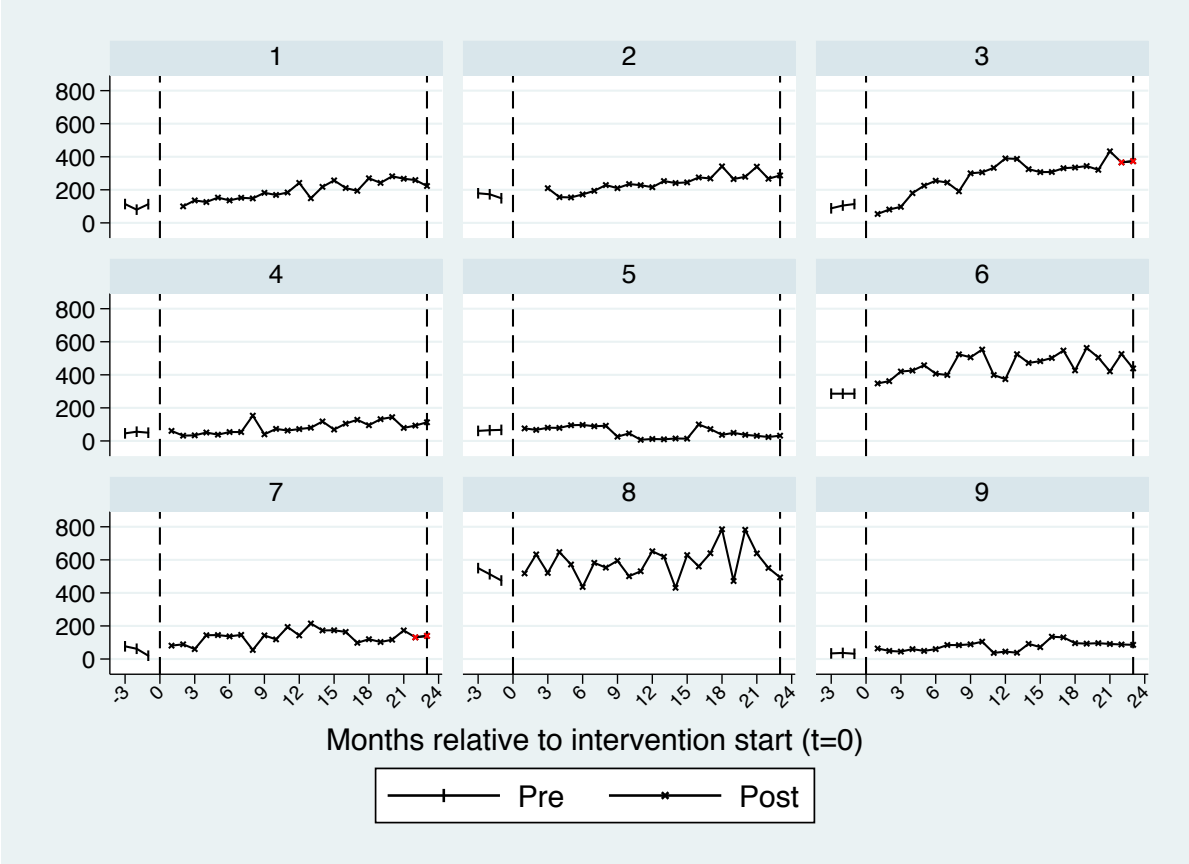
Health Center Number	Preinitiative Monthly Average	Peak Postinitiative Monthly Total[a]	Postinitiative (Final 3 Months) Monthly Average	Change in Volume: Number of Visits	Change in Volume: Percentage Change
1	102.3	282	249.7	147.3**	144.1
2	167.0	342	298.0	131*	78.4
3	102.3	433	390.8	288.4**	282.0
4	50.7	153	95.0	44.3*	87.4
5	64.3	100	29.0	-35.3***	-54.9
6	286	563	462.0	176*	61.5
7	53.0	215	148.1	95.1*	179.4
8	512.7	785	561.3	48.7	9.5
9	34.3	135	88.3	54***	157.4
Mean	152.5	334.2	258.0	105.5*	69.2

NOTE: The postintervention monthly average does not include the first three months of the intervention. Two sites (three and seven) did not report data for the last two months of the intervention. For these sites and months only, we imputed data using a prior three-month moving average. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.
[a] Total visits for the highest-volume month in the postinitiative period.

In addition to comparing monthly visits in the pre- and postinitiative periods, we conducted a more formal ITS analysis, the first step of which we show for each health center in Figure 4.1. The ITS analysis allowed us to estimate the linear trend for the preintervention and postintervention periods separately. Some health centers experienced a more-immediate increase

in telemedicine volume after the intervention began, while others gradually increased volume over time.

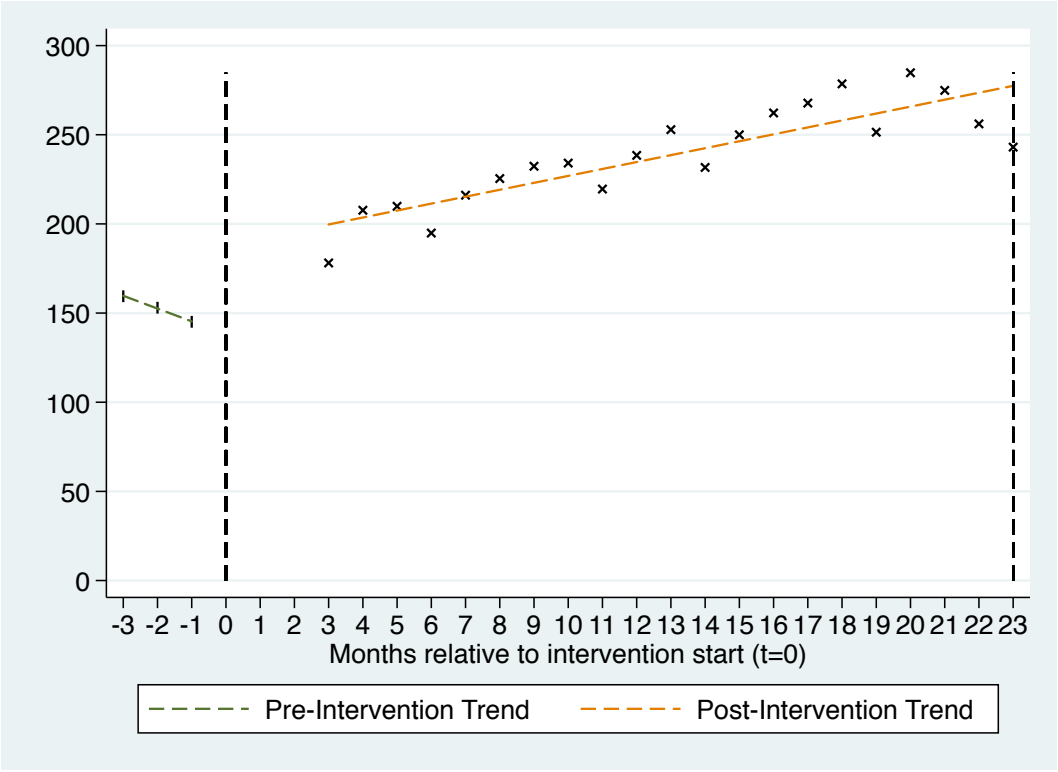
Figure 4.1. Interrupted Time Series of Monthly Telemedicine Volumes at Nine Health Centers



NOTE: Dashed lines represent intervention start and end dates. Red X's denote imputed data.

Next, we aggregated all of the health centers' volume data together and calculated the average number of telemedicine visits per month at all nine health centers (Figure 4.2). It is common in the scientific literature to eliminate observations just prior to and after the intervention as a washout period. In particular, we worried that because health centers were already offering telemedicine, it would be difficult to disentangle earlier influences from the SMTSN initiative (Baker, 2017; Stürmer and Brookhart, 2013). For this reason, we eliminated volume data in the first three months of the initiative at each health center. Two sites (three and seven) did not report data for the last two months of the initiative at the time of this analysis. For these sites and months only, we imputed their volume as the average of the previous three months. Three months prior to the initiative, there were about 160 telemedicine visits per month ($p < 0.001$) on average across all health centers, trending downward by about seven visits per month ($p < 0.001$). Starting three months into the initiative, there were about 200 visits per month on average, increasing at a rate of 11 visits per month ($p < 0.001$).

Figure 4.2. Pre- and Postintervention Linear Trends, All Sites



On average, health centers were experiencing a slight downward trend in telemedicine utilization prior to the start of the SMTSN initiative. As shown in Figure 4.2, there was a large and significant increase in telemedicine volume at the beginning of the initiative, which continued to increase over time. Although this upward trend in telemedicine volume might be because of the initiative, we cannot rule out the possibility that this was because of broader trends in telemedicine growth. For example, it could be the case that other health centers in California also increased their telemedicine volume over the same period because of larger trends in the field.

5. Sustainability

One key indicator of implementation success is whether a program is maintained. The RE-AIM framework defines *maintenance* as the "extent to which a program becomes institutionalized or part of routine organizational practices and policies" (Gaglio, Shoup, and Glasgow, 2013). In interviews and focus groups with CFOs and telemedicine coordinators and staff, we set out to understand whether health centers were likely to (1) maintain the telemedicine volume achieved at the end of the initiative and (2) maintain the current staffing structure for their telemedicine programs.

Perceptions of Telehealth Sustainability

Although there was near universal agreement among participating health centers that telemedicine would continue for a variety of reasons, including ongoing patient need and alignment with strategic priorities and health center values, staff did not specify a particular volume goal. In general, staff from most health centers argued that telemedicine services were likely permanent but that financial factors would determine the scope of services. As described by a CFO, "We would really have to think carefully about the margin of loss when it scales before we decided to move forward with something else."

Potential Barriers to Maintaining Telemedicine

We asked CFOs for their perspectives on barriers to maintaining telemedicine after the initiative. All CFOs reported that telemedicine was a cost center for their organizations and identified several factors that make it difficult for health centers to break even on telemedicine. Some barriers with cost—and, by extension, sustainability—implications included high no-show rates, limited connectivity, restrictions that do not allow providers to provide telemedicine services, telemedicine visits taking up space that could be used for more-profitable visits, inconsistent coverage, the inability to be reimbursed, longer visits, challenges related to monitoring and oversight, low productivity, and costs associated with switching providers.

High no-show rates. Although CFOs representing multiple health centers mentioned that telemedicine coordinators had helped reduce no-show rates, they also mentioned that no-shows continued to pose a challenge to breaking even with telemedicine services. A key reason why no-show rates are more problematic for telemedicine than for scheduled in-person visits is because health centers typically have to pay the telemedicine vendor regardless of whether a visit was completed and could be billed. In contrast, with in-person visits delivered by salaried clinic staff,

a clinician with an unexpected opening can use that time productively on other tasks, including, in some cases, completing a visit with another patient in the waiting room.

Limited connectivity that can waste clinic and vendor staff time. According to one CFO, "We don't always get things working [being so rural]. Up until recently, we had connectivity only in one direction, and if the internet goes down, which it did frequently, everybody's shut down. That's a waste of time on both ends."

Restrictions by health plans that do not allow mid-level providers to provide telemedicine services. A CFO explained that one of their health plans would not reimburse for any of the telemedicine visits that their current mid-level (medical specialty) providers provide.

Telemedicine visits taking up physical space or exam rooms that could be used for more-profitable visits. Several CFOs discussed the fact that telemedicine visits occupy space that could be used for other services. One CFO commented that every time her health center has a telepsychiatry visit, they use two offices instead of one. According to this individual, "But right now, realistically, we're using two offices to provide one service every time we use this. . . . I don't think it's financially sustainable when we look at it from an operational perspective on our utilizing our space to the best of our abilities." Another CFO explained, "There is an opportunity cost if you use a room . . . you are not seeing as many patients, particularly if you have a PPS environment . . . your volume is such an important issue that you could use that room for something else." They pointed out that telemedicine in the home (where the patient's home is the originating site) has the advantage of requiring less clinic space.

Inconsistent coverage of telemedicine services across payers and the fact that health centers are reimbursed only for some visits and/or cannot offer telemedicine to all patients. According to a CFO, "We do our visits on telemedicine regardless of somebody's payer that they're using to get us compensated. There are many who do not have any coverage at all."

Inability to be reimbursed for two or more visits on the same day. Although one CFO mentioned that her health center was able to bill for multiple visits in the same day, others mentioned that their health centers were not. They pointed out that this restriction was inconvenient for patients and prevented health centers from having additional billable visits.

Telemedicine visits for specialty care tend to be longer in part because an outside provider—rather than clinic staff—is controlling the visit. These longer visits can affect workflow and put extra demands on physical space. As one CFO explained, "We are struggling to provide access to care so we've been building clinics every two to three years. This is an incredible cost to us. The demand for access is going to limit our ability to grow any kind of program that involves a longer visit."

Need for extensive monitoring and oversight on scheduling and billing that can be time-consuming for staff. Several CFOs pointed out that a great deal of work must occur behind the scenes for a telemedicine visit to happen, including reminder calls to decrease the no-show rate and patient follow-ups to ensure continuity of care. Without oversight, visits might not actually take place, even when patients come to their scheduled visits on time. According to one CFO,

"So what we do, we do have to do lot of hand holding, a lot of calls, reminder calls asking about barriers, if they have transportation problems, arranging for transportation; those are all the different needs that have to be met in order to make that one visit happen." Another pointed out that inadequate oversight can result in hours of nonbillable provider time. She explained, "Staff get confused on the protocol and send the patient to the wrong place, or aren't following the protocol to set up the equipment before the visits. Right when the office opens, it causes delays in patients being seen. So there've been a lot of things that contribute to the services actually not taking place."

Low productivity of contracted telemedicine providers. One CFO mentioned that her telemedicine vendor did not always see all the patients on the schedule, despite being paid for the full day. She explained, "Lately, we've been having some issues with our vendor, like starting their clinic late. And so our patients are here waiting for a while and then some of them don't get to be seen but we're like, paying for the full day."

Costs associated with switching vendors because of poor performance. The same CFO who noted productivity issues with the current vendor also discussed the costs associated with switching vendors. She explained, "We are thinking about another vendor, but then we'd have to start the credentialing process and training all over again and so there's financial implications of just starting something else with someone else . . . you know, that time it takes to do that as well."

Interestingly, several CFOs identified ways in which telemedicine can help health centers and patients reduce costs. For example, one health center with multiple sites no longer needs to reimburse providers for mileage and related travel costs because telemedicine has enabled providers to remain in one location rather than travel between sites.

Multiple CFOs mentioned that they would seek additional grant funding to offset some of the financial barriers mentioned earlier, but would probably be able to support a telemedicine program through operating revenue. A CFO explained,

> We are a big organization, and so some of these costs we are able to subsidize with other revenue sources. It is something that we will continue . . . because we do have a lot of need in some of our rural clinics so that we want to continue to provide those service into the future, whether or not it's reimbursable by the health plans or by the state or any of those changes. It's still a huge impact to our patients and we'll figure out another mechanism to try and subsidize the program.

Another CFO pointed out that maintaining a telemedicine program was feasible because a program of limited scale is not particularly expensive. He noted,

> We have some legacy equipment that we got on a grant a long time ago—which are big telemedicine equipment—and at this point, when we expand, we're just using the more low-tech but also low-cost video equipment. . . . [Telemedicine is] run by front office and medical assistance staff that are doing a great job. We have a great coordinator, it's not a whole lot of staff. It [has] protocols and

> workflows that essentially are similar to our existing workflow. It's not a heavy lift in change. . . . It's just not that expensive.

We also asked coordinators and other staff for their perspectives on maintaining telemedicine. Two health centers were committed to continuing to expand telemedicine volume in the coming years. One telemedicine coordinator explained that a new building had been purchased to support the expansion of her health center's telemedicine program. Another telemedicine coordinator in a health center that uses its own staff for telemedicine visits explained,

> We'll only grow. There's no going back because I mean they've absolutely embraced this at our executive leadership level. We're organization-wide, so that train has left. So there really is no consideration at all to pull back or not use this or not fund it. We're actually going the other direction because it's allowing us to not have to hire a physical person now. . . . That costs a lot of money to ramp up a provider, and it literally takes them particularly a year and a half before they get a full panel. Now, we don't have to do that. We can just start using other services pulled from other sites until everyone is at capacity.

Staff from other health centers were not sure what would happen to their dedicated telemedicine staff in the coming years. Some intended to maintain dedicated staff, while others were committed to keeping individuals originally hired for telemedicine positions in the organization in some capacity. They argued that, even if staff are reassigned, telemedicine expertise will remain within the organization. According to one telemedicine coordinator, "There's a commitment to these positions and the staff that we will preserve. If the program has changed so much that we have to restructure it, then we'll tackle that . . . if something changes, we don't necessarily remove the person because there's so much work to do, we just give them other work."

6. Conclusions

Volume at SMTSN health centers increased significantly from 2017 to 2020. According to health center staff involved in the initiative, this growth was largely achieved by dedicated telemedicine staff who added new service lines, contracted with new vendors and/or purchased additional blocks of time with existing vendors, began offering telemedicine services at new clinic locations, and purchased new equipment. They also made telemedicine visits more efficient and increased utilization by improving workflow, training and retraining staff, and promoting telemedicine across the organization. Health center activities were supported by SMTSN through a learning collaborative and technical assistance.

Although our analyses are exploratory, these activities appear to be successful in growing telemedicine services. In fact, the two health centers that experienced the most growth increased average monthly visit volume by 160 percent and 196 percent, respectively. Although it is possible that this growth was because of secular trends (i.e., overall increases in the demand for and provision of telehealth in California or nationally), other studies have documented lower telemedicine growth rates absent particular interventions (Creedon et al., 2020; Harvey et al., 2019; Mehrotra et al., 2017; Yu et al., 2018).

Thus, the amount of growth we observed was substantial and likely not solely because of secular trends. Nonetheless, ongoing challenges to implementation and sustained growth were identified. In the future, the financial sustainability of large telemedicine programs aimed to increase access to specialty care within community health centers likely will require more-generous reimbursement policies across payers or external revenue sources, such as grant funding.

Using the evaluation results presented in this report and in the accompanying short reports, along with the lessons learned identified by participating health centers, the RAND team developed the following recommendations for health centers and policymakers to support telemedicine implementation. It should be noted that these recommendations were developed before the COVID-19 pandemic resulted in significant changes to the regulation, reimbursement, and use of telemedicine services. Nonetheless, at the time of this writing, it was unclear how long the public health emergency would last and what temporary changes to telemedicine delivery would be in place. Given this uncertainty, these recommendations might be beneficial to stakeholders who are interested in growing telemedicine programs in safety-net settings.

Recommendations for Health Centers Based on the Initiative

Based on our findings from the initiative, health centers should

1. **add dedicated telemedicine staff.** The SMTSN initiative showed positive experiences with hiring and maintaining telemedicine coordinators. For more information on how to define the role of the telemedicine coordinator, see Sousa et al., 2020.
2. **implement various promising strategies (see Palimaru et al., 2020) to improve the efficiency and quality of telemedicine services.** As part of the evaluation, we identified dozens of promising strategies that might be applicable to telemedicine implementation in a broad variety of health care settings.
3. **offer telemedicine services to patients in their homes.** Health centers in states with Medicaid programs that allow FQHCs to serve as distant sites and permit telemedicine in the home should consider implementing this telemedicine delivery model. This model, which was widely implemented during the COVID-19 pandemic, has several advantages. First, it allows health centers to serve patients who live farther away and/or have mobility challenges. Furthermore, it might be more sustainable because less physical clinic space is used, and it can allow salaried providers to work to full capacity. Despite the advantages of this model, few health centers in the initiative were serving patients in their homes at the time of data collection. However, several were considering pursuing this model in the future because of regulatory changes in Medi-Cal.
4. **participate in a learning community of peer organizations if the health center is beginning to implement telemedicine or seeking to expand it.** Having peer health centers to consult with about contracting, working with particular vendors, workflow, and equipment needs was very helpful for health centers in the initiative. Many health centers reported that the opportunity for peer learning was one of the major strengths of the initiative.
5. **consider the opportunity cost for telemedicine when deciding whether to expand existing telemedicine programs.** If telemedicine visits are additive (rather than replacing PCP visits), then it is not critical that all visits be billable or that all visits be reimbursed at a favorable rate. However, if telemedicine visits replace PCP visits (e.g., because there is limited physical space in the clinic), it might make more financial sense to keep telemedicine programs small. If financial sustainability is a leading concern, consider offering telemedicine services that do not generate as much revenue as in-person visits at clinic sites that are not operating at capacity.
6. **track telemedicine-related costs.** Few health centers in the initiative were systematically tracking costs, and this resulted in some misconceptions about what was driving costs. Understanding the true costs of program implementation can identify opportunities to make telemedicine more efficient. See Zocchi et al., 2020, for a detailed analysis of telemedicine-related costs at participating health centers.

Recommendations for Policymakers and Payers

Based on our findings from the initiative, policymakers and payers should

1. **clarify telemedicine policies.** Our study revealed that many health centers remained uncertain about which services were covered and in what circumstances. As a result, health centers were wary of offering certain services or were not billing for services that likely were billable.

2. **align telemedicine policies.** Another strategy to reduce uncertainty about which services are covered is for payers within a state or region to align their policies and billing practices. Common policies can then be communicated to health care organizations, including safety-net providers, through multiple challenges.
3. **explore the impacts of telemedicine in the home versus health care settings on access, quality, and costs.** Given growing interest in using telemedicine in the home and recent changes in Medi-Cal to support this model, it is important to assess the early experiences of safety-net settings in delivering these services and how this telemedicine model differs from traditional models.
4. **allow FQHCs to serve as distant sites.** Restrictions on FQHCs serving as distant sites (e.g., in the Medicare program) were limiting their ability to engage in various telemedicine models that can increase access to care. This is especially important, given the growing movement across payers to support more telemedicine in the home. (The Medicare program began allowing FQHCs to serve as distant sites in 2020 as part of the response to the COVID-19 pandemic; however, it is unclear whether this change will endure after the pandemic is over.)
5. **support health centers in pooling demand for telemedicine visits across health centers to facilitate contracting.** Several participating health centers reported that they had difficulties contracting with telemedicine vendors because they did not have enough demand for a certain specialty to meet the vendor's minimum requirements. As a result, they were not able to contract for a particular service. Payers and policymakers offer guidance and mechanisms for health centers to pool demand and conduct collaborative procurement.
6. **support health centers in contracting with third-party telemedicine providers.** Health centers reported challenges with contracting and working with telemedicine providers, including vendors (e.g., how to reduce the risk of vendor abandonment, how to negotiate favorable terms). They could benefit from support and technical assistance on this topic to avoid gaps in care and improve program sustainability.

Our study has several limitations. First, we were not able to obtain telemedicine volume data from a control group of health centers that did not participate in the initiative, and we had only three months of preinitiative volume data to establish a baseline trend. As a result, we cannot definitively attribute the growth in telemedicine volume to the initiative. Second, data on certain outcomes of interest were missing for a subset of health centers because of data reporting burden or lack of data infrastructure. In those cases, we dropped health centers with incomplete (more than 10 percent missing) data from the sample. Third, given that the initiative included only health centers in California, it is unclear how their experiences will generalize to other health care settings or to health centers in other states with different telemedicine policies. Fourth, there are several limitations related to the qualitative data. Staff from participating health centers chose the providers with whom we spoke at site visits and might have selected those with more-favorable views of telemedicine. In some cases, dedicated telemedicine staff joined interviews with providers, which might have altered the nature of the content we elicited. Fifth, data collection for this study occurred prior to the COVID-19 pandemic. There have been many

changes to telemedicine policy in response to the public health emergency, and it is unclear how long these changes will be in place. Many of the policy barriers mentioned by study participants (e.g., Medicare not reimbursing for telemedicine in urban communities) were no longer applicable in spring 2020. Finally, although the evaluation was entirely independent of the initiative, participants might not have shared all negative experiences with telemedicine and with growing telemedicine volume because of concerns that it could affect their current or future funding.

Despite these limitations, this comprehensive evaluation offers evidence that dedicated telemedicine staff and supportive activities can help community health centers serving safety-net populations expand telemedicine services. Findings provide multiple strategies and promising practices for health centers starting or expanding programs. Although there are ongoing challenges to implementing and sustaining telemedicine, including high operations costs and limited reimbursement, health center leaders that took part in the SMTSN initiative were unequivocal in their commitment to sustaining telemedicine beyond the initiative. In most cases, dedication to providing needed services to patients outweighed challenges. Future studies should examine ways to support health centers in expanding telemedicine in ways that are economically sustainable, and policy changes should continue to address barriers that limit the use and profitability of these programs.

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