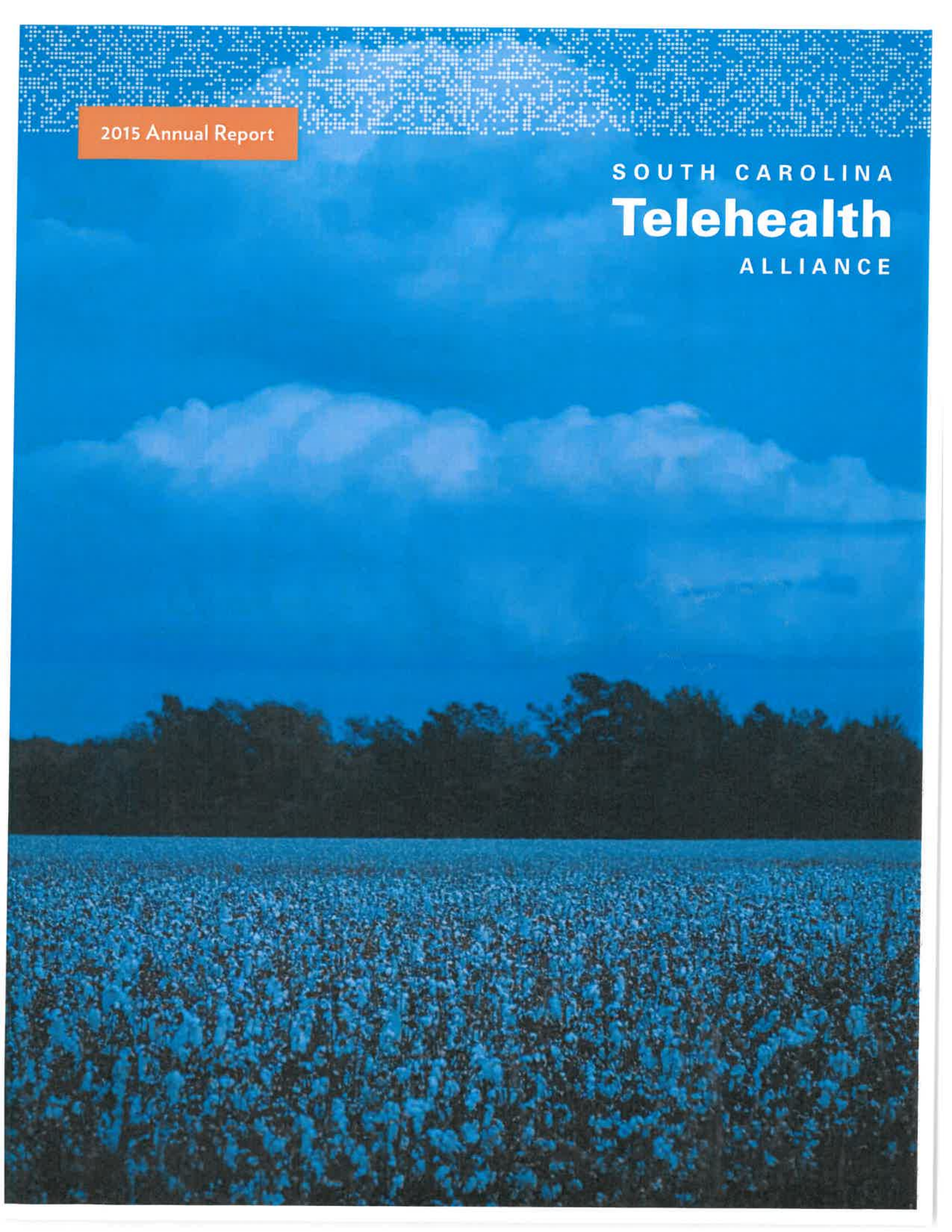
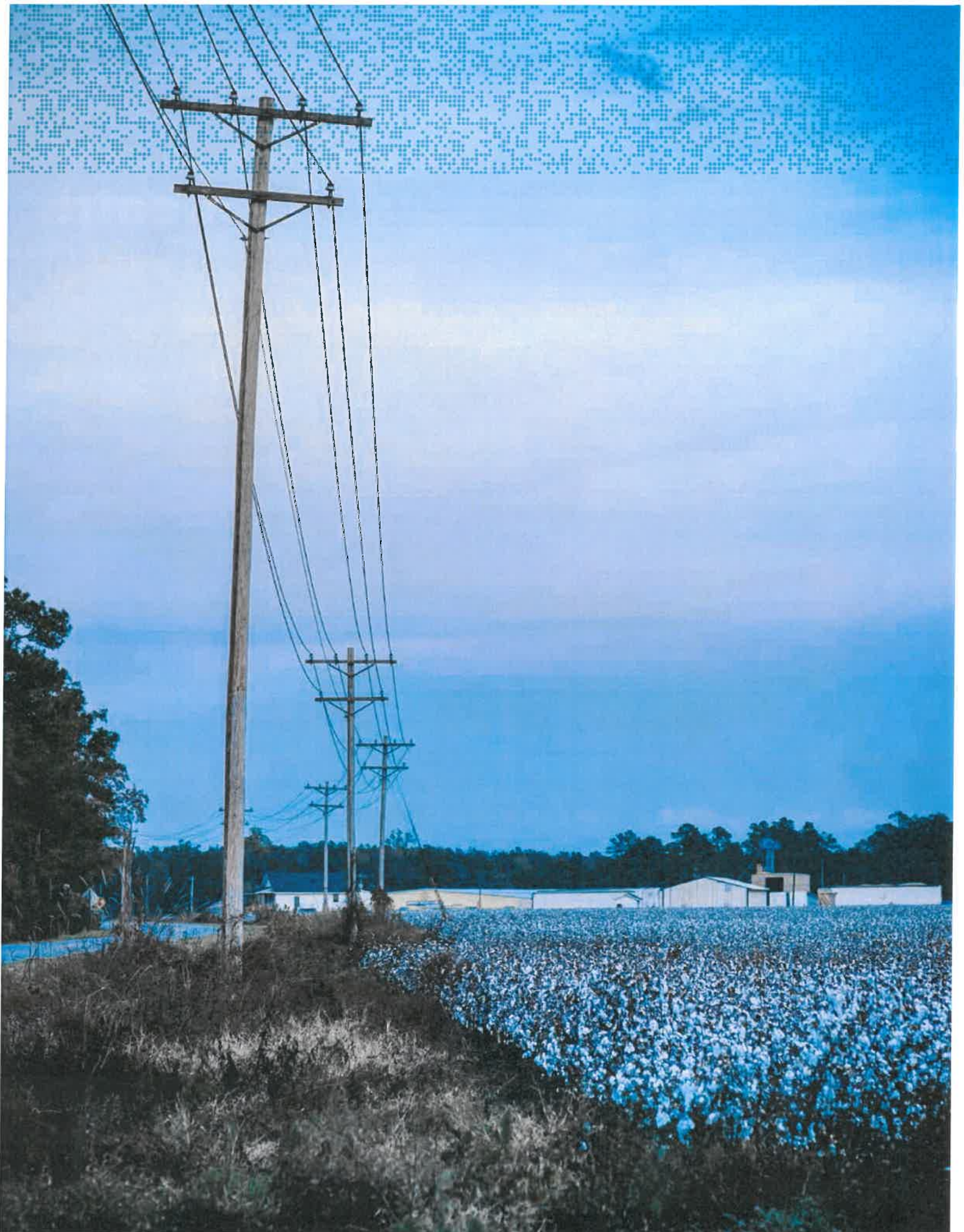


2015 Annual Report

SOUTH CAROLINA
Telehealth
ALLIANCE





Fellow South Carolinians:

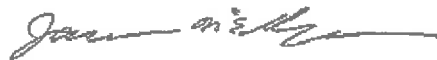
The growth of telehealth is a worldwide phenomenon, driven by the ever increasing need to care for larger populations with fewer resources.

South Carolina is unique in its leveraging of telehealth to do just that. Through a collaborative strategy involving multiple institutions, the South Carolina Telehealth Alliance is developing telehealth capacity that meets the objective of improving the health of all of our state's citizens.

The judicious application of state-appropriated funds has heralded an unprecedented growth in the use of telehealth technologies and real-world impact in communities. Within this 2015 Annual Report, you will find strong evidence that linking health providers with their patients and with each other in new ways is improving access to care and disseminating best practices equitably across South Carolina. Simultaneously, telehealth is enhancing the efficiency of the care system.

While telehealth technologies are indeed opening exciting possibilities, the true catalyst for these outcomes is human passion, ingenuity and collaboration. Powered by the financial support and vision of our state's leadership, the Alliance will continue to establish a coordinated, smart grid approach to patient care that will transform our own delivery system and become a model for the nation.

Best regards,



James T. McElligott, M.D.
*Medical Director, MUSC Center for Telehealth
Advisory Council Co-Chair, SC Telehealth Alliance*





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- 25 2015 Telehealth Innovation and Development Grant Recipients

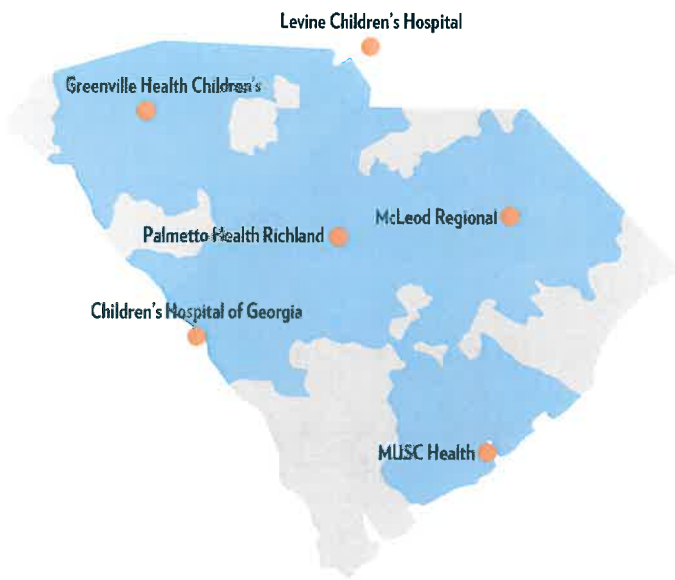


25,000+

Number of telehealth
consultations in the state
of South Carolina in 2015

Hospital-to-Hospital Inpatient Specialty Consultations

2013 *Pre-Telehealth
60-Minute Drive Time
to Pediatric Critical Care*



2016 *Post-Telehealth Implementation
60-Minute Drive Time
to Pediatric Critical Care*

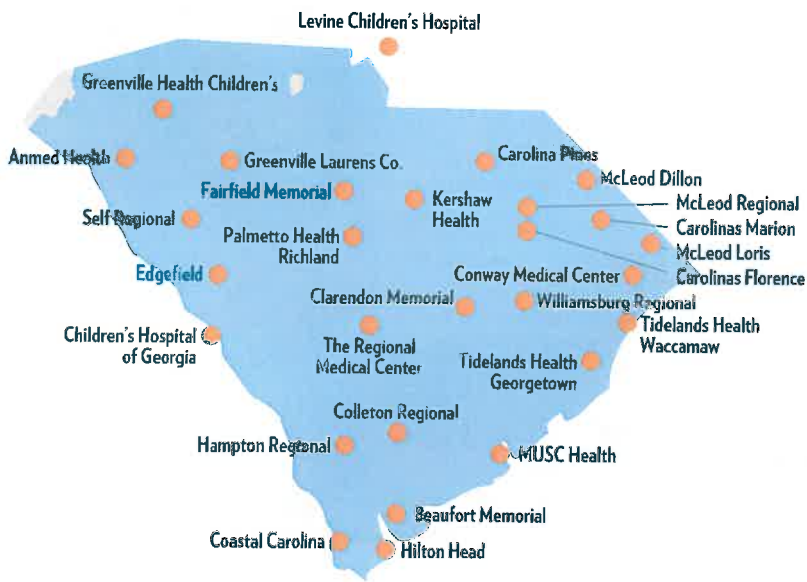


MUSC Health is executing a service development work plan to have all departments who offer inpatient consultation services participate in telehealth.

Greenville Health System and Palmetto Health are contracted to expand their telehealth capabilities and serve as South Carolina Telehealth Alliance support hubs for telehealth growth in their regions.

Dr. David McSwain provides pediatric inpatient teleconsultation.

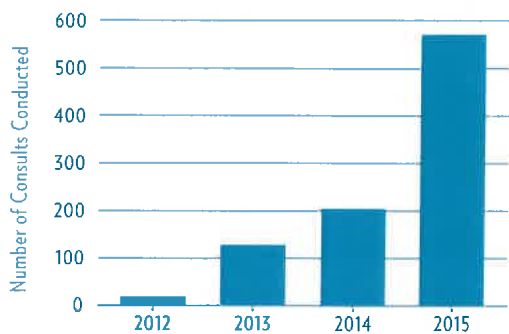
2017 *Future State* 60-Minute Drive Time to Pediatric Critical Care



Service Growth

Provider-to-provider outpatient consultations improve patient access to specialists

Annual number of outpatient consultations



From 2014 to 2015, MUSC's outpatient teleconsultation volume increased by **183%**



Correctional facilities



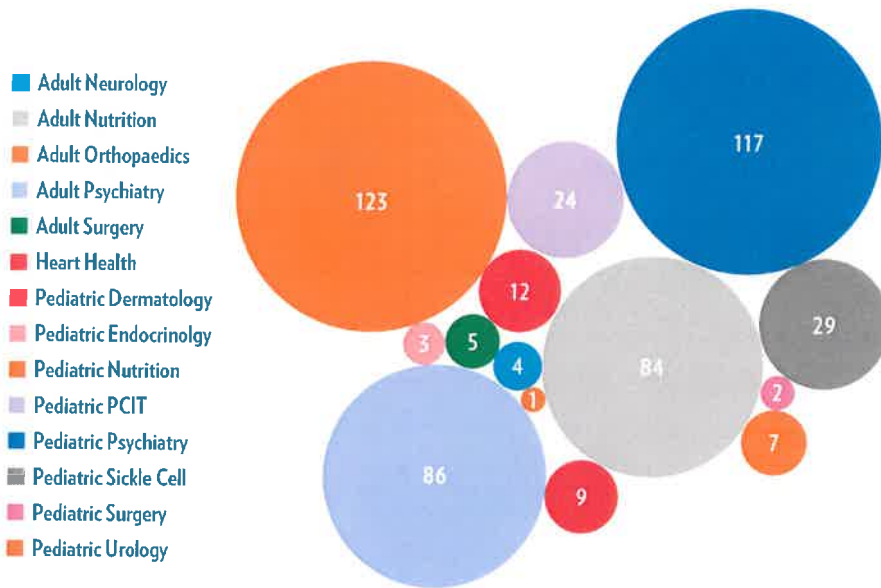
MUSC Telehealth providing training to staff members of Kirkland Correctional Facility Receiving and Evaluation (R&E). All South Carolina prisoners serving a 90-day sentence or more are processed through Kirkland R&E.

MUSC is in the process of establishing telehealth services for four facilities within the South Carolina Department of Corrections (SCDC).

Projected benefits include:

- Decreased transfers to hospitals
- Improved workflow and patient throughput
- Elimination of physical intake backlog
- Informed emergency triage (send or stay)
- Improved management of chronic disease

Adult & pediatric psychiatry outpatient consultation



40%
of all outpatient
consults conducted
by MUSC were for
adult and pediatric
psychiatry in 2015

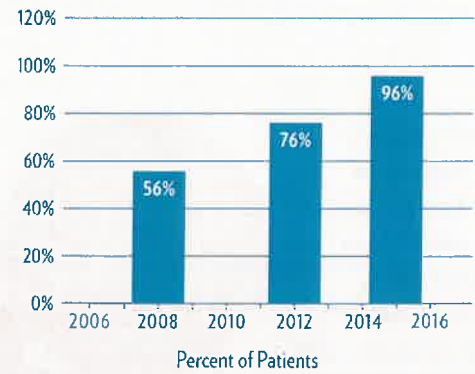


Pediatric Psychiatrist,
Dr. M. Frampton
Gwynette, likes the
ease of the telehealth
consultations.

Telestroke

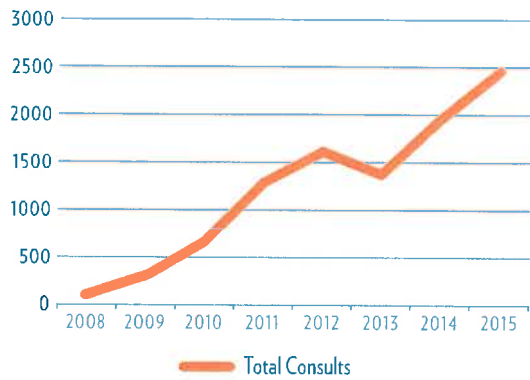
96% of South Carolina residents are within a 60-minute drive of expert stroke care

60 Minute Access

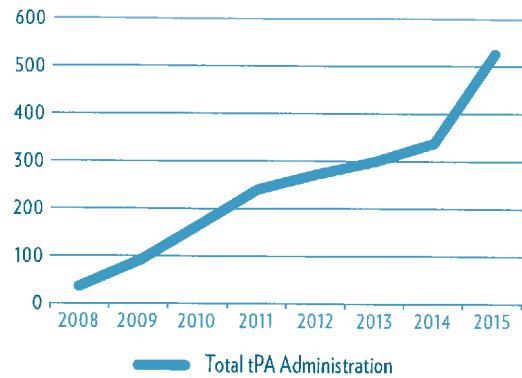


Telestroke program connects community hospitals with stroke specialists, including Dr. Christine Holmstedt.

Total TeleStroke Consults 2008-2015
MUSC Health, Greenville Health System, Palmetto Health



tPA Administration 2008-2015
MUSC Health, Greenville Health System, Palmetto Health

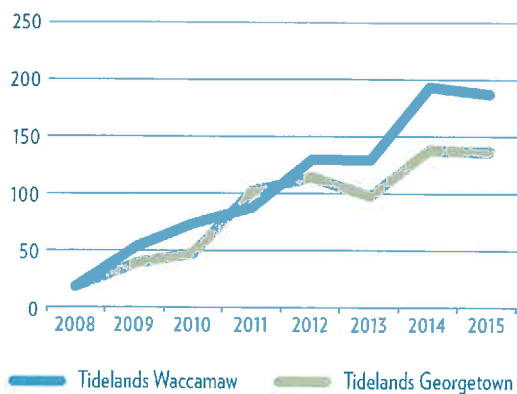


The Money-Saving Potential of tPA

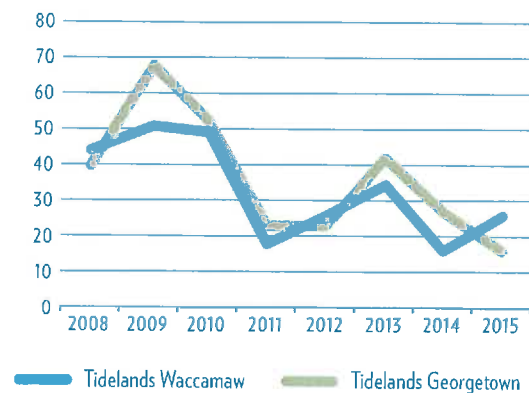
From 2014-2015 tPA usage increased by 55% which equates to an additional cost-savings of \$642,444 over a six-year period.

Tidelands Health: Keeping Patients in their Community

**Tidelands Health
Total TeleStroke Consults**



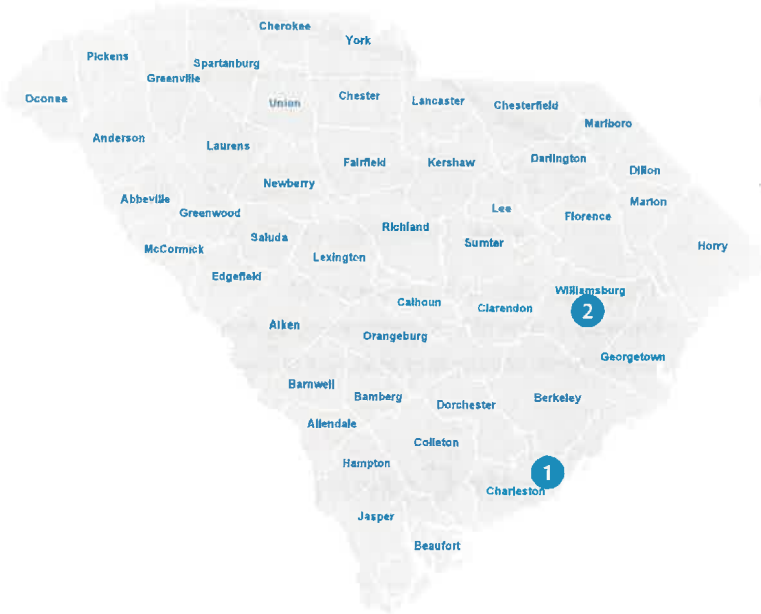
**Tidelands Health
Stroke Transfers to MUSC**



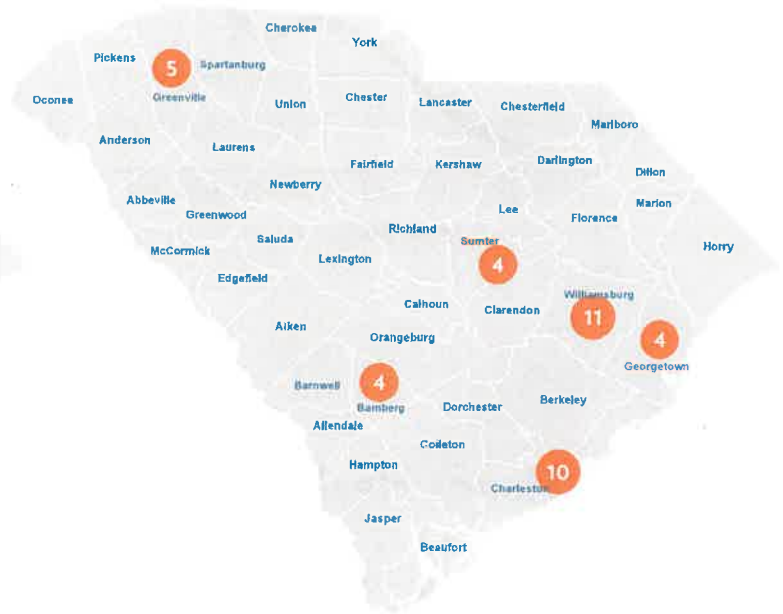
TeleStroke has impacted the number of patients transferred to other hospitals – enabling patients to stay closer to where they need to be ... home.

School-based Telehealth

2014 School-based Telehealth (3 sites)

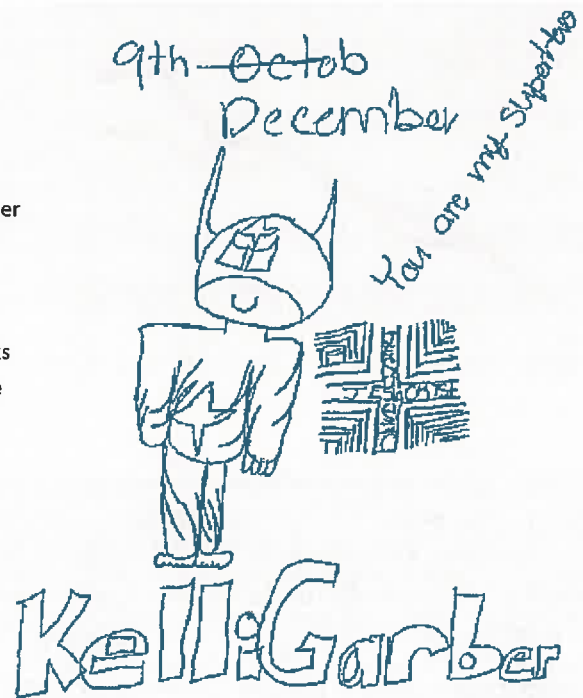


2016 School-based Telehealth (38 sites)



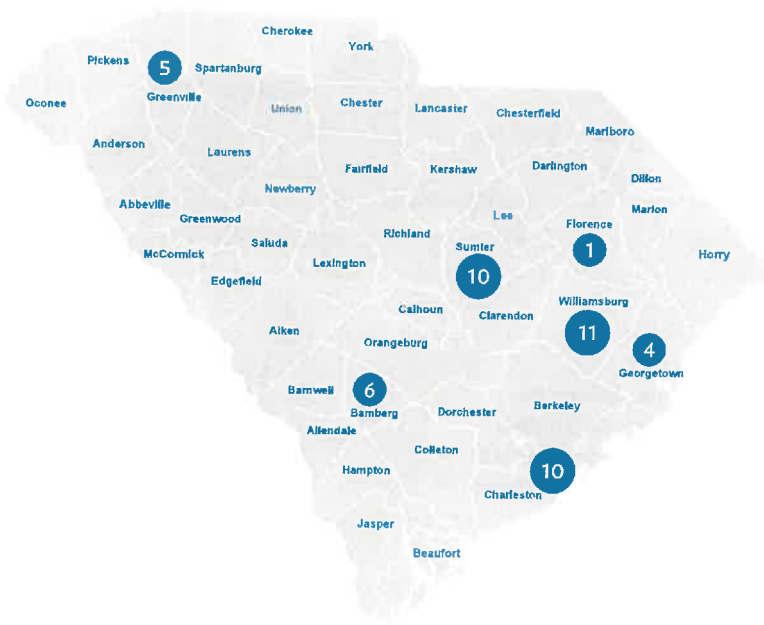
Success story

A seven-year-old boy came to the school nurse’s office at Kenneth Gardner Elementary School with significant wheezing. The nurse recognized that he needed breathing treatments. Through the MUSC School-based Telehealth program he was able to be evaluated and treated quickly and returned to class. He was seen several more times over the following weeks to ensure his asthma was well controlled. Before telehealth, he would have been referred to an emergency room for treatment. He made this picture for the MUSC nurse practitioner, calling her his “Superhero.”



2017

School-based
Telehealth
(47 sites)



In 2016, school-based telehealth will be available for:
100% of children in Williamsburg County
50% of children in Bamberg County
25% of children in Sumter County

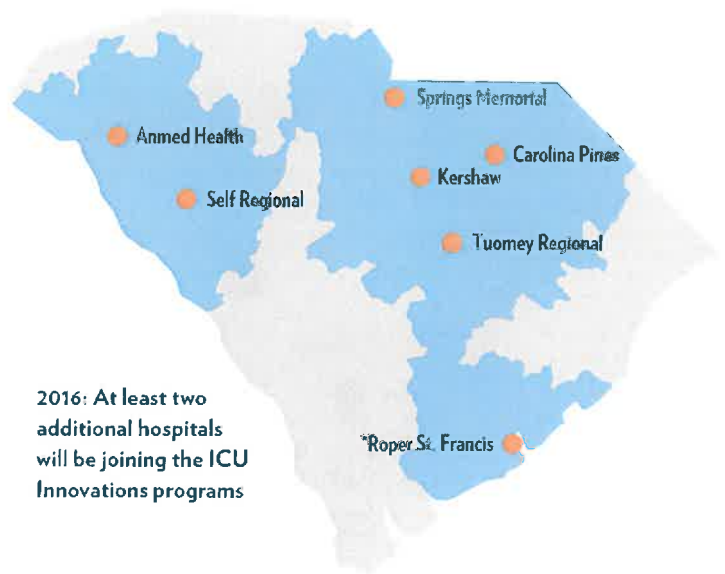
Tina Brown
 Hemingway Elementary
 School-based Telehealth nurse

Tele-ICU and ICU Innovations

2015 60-Minute Drive time to Remote-Monitored ICU Care



2016 60-Minute Drive time to Remote-Monitored ICU Care



2016: At least two additional hospitals will be joining the ICU Innovations programs

*Tele-ICU monitoring only



“We are using cutting edge technology to leverage specialist expertise in critical care in order to collaboratively support ICUs across the state. Direct patient care delivered remotely, coupled with novel educational offerings, assist community hospitals in bringing current best practices to their patients’ bedside with the goal of ensuring our state’s sickest citizens receive the best possible treatment 24/7/365.”

— Dee Ford, M.D., MSCR
Medical Director, MUSC Critical Care Outreach Program
Medical Director, Medical Intensive Care Unit

ICU Innovations offers peer-to-peer education, virtual case conferences and real-time patient consultation.

Benefits & return on investment

Hospitals with this Tele-ICU model have seen remarkable results

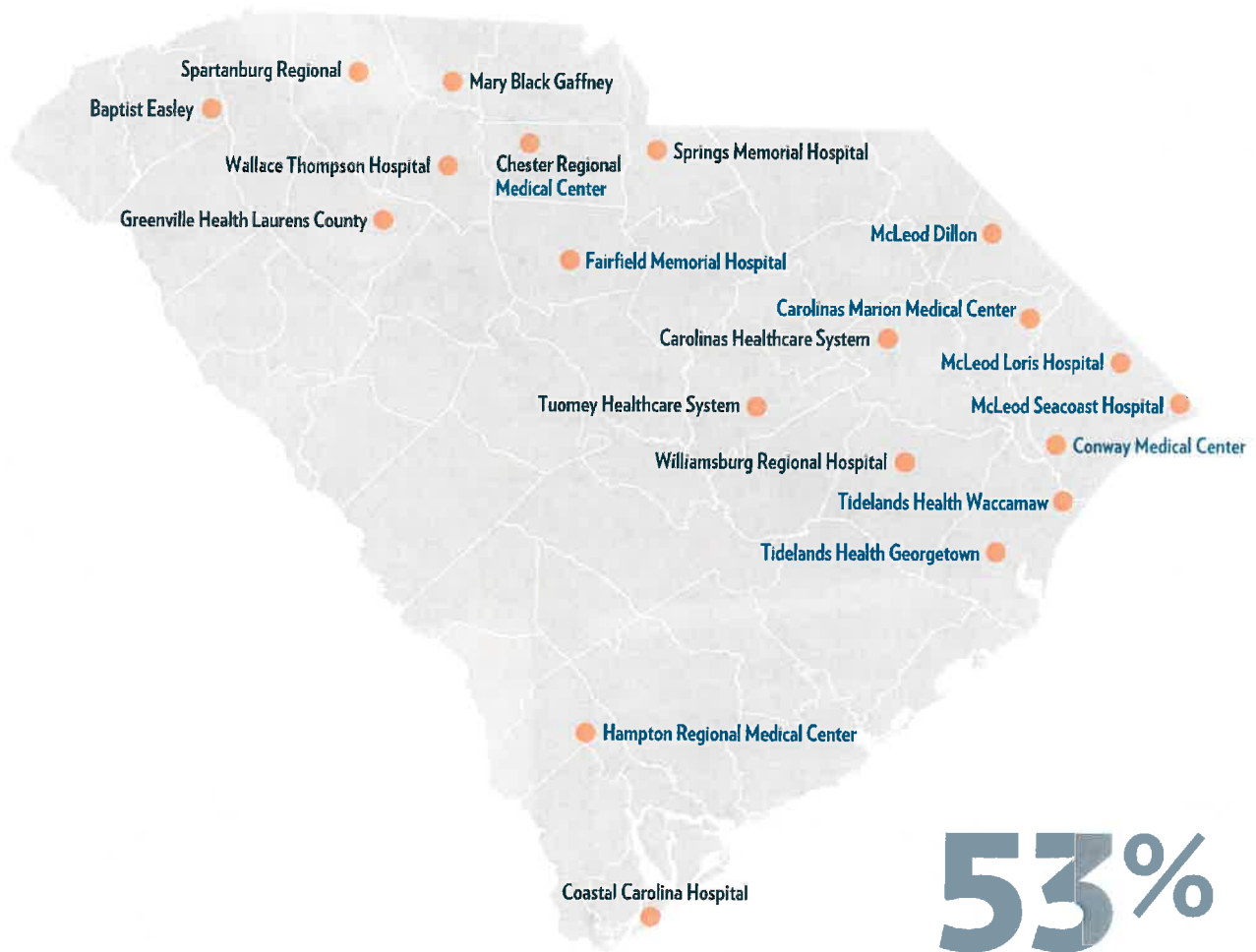
- 40% reduction in mortality
- 25% increase in patient throughput
- 17% increase in patient growth



Dr. Dee Ford monitors patients across the state from the 'bunker' in Charleston.

SCDMH Telepsychiatry Consultation Program

DMH telepsychiatry hospital connections



53%
reduction in
overall hospital
length of stay

26,900

The number of consultations completed by SCDMH telepsychiatry program since its inception

Primary goals of DMH Telepsychiatry Consultation Program

- Ensure patients receive a quality psychiatric assessment as soon as possible
- Initiate medication and/or other treatment as prescribed
- Reduce length-of-stay in the hospital
- Accrue savings to the hospital
- Propose comprehensive discharge planning for continued aftercare in the community

34%

of patients receiving DMH telepsychiatry consultations are recommended for same-day discharge



\$3,006

Average cost savings per patient per consultation

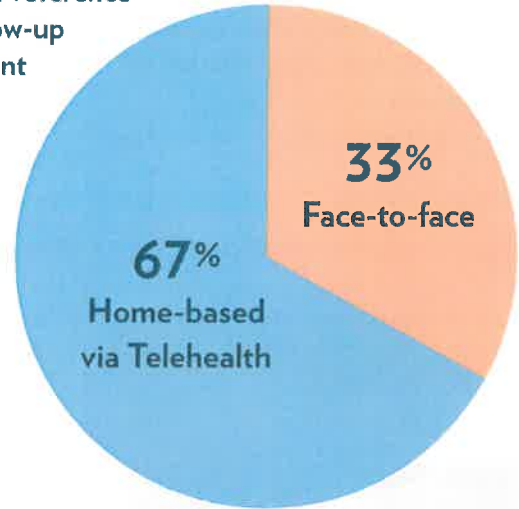
Remote Home Monitoring

Telehealth Resilience and Recovery Program (TRRP)

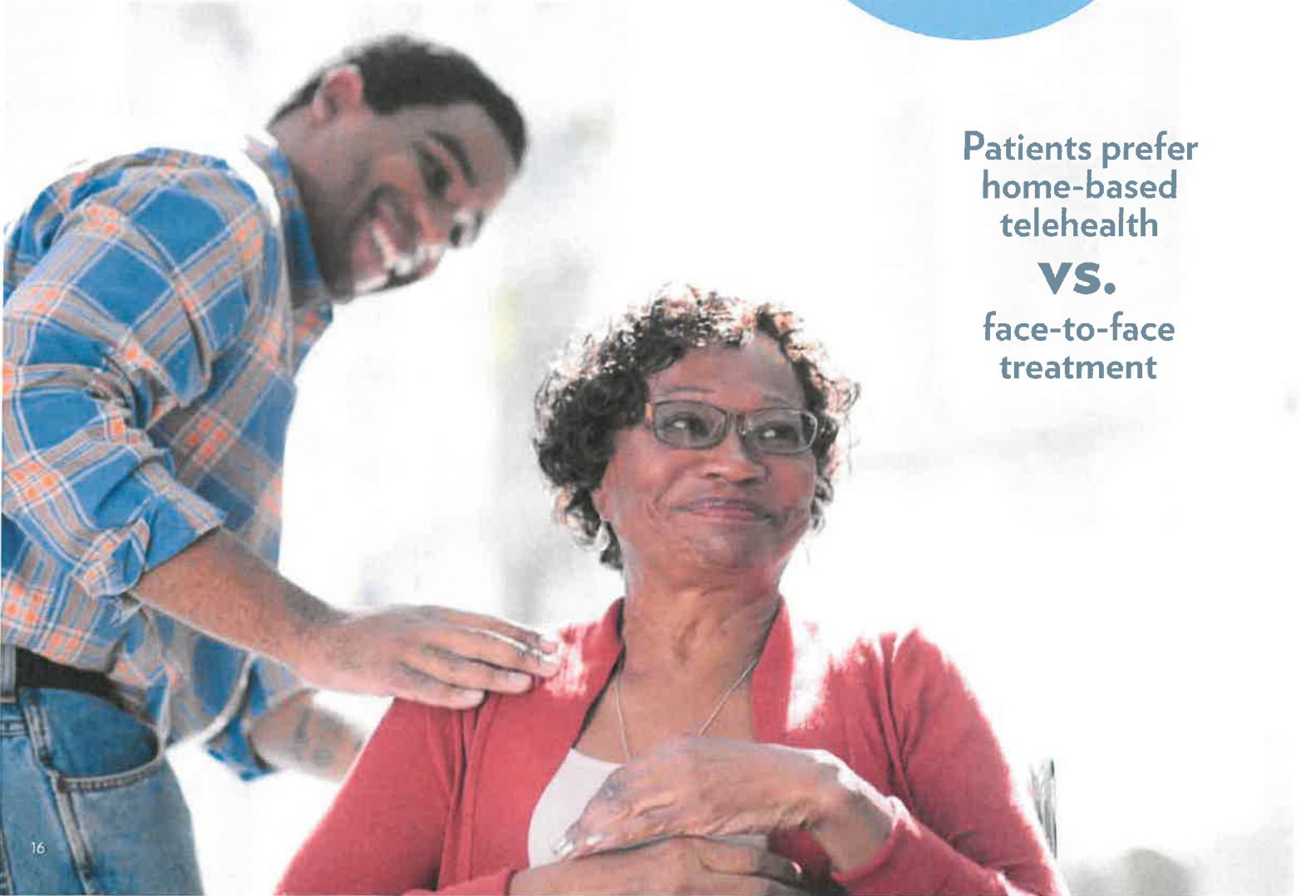
Patients hospitalized for traumatic physical injuries are at high risk to develop posttraumatic stress disorder (PTSD) or depression, and require follow-up care to facilitate mental health recovery.

The TRRP model follows patients at home; home follow-up included a telehealth option and two-thirds of patients chose telehealth.

Patient Preference for Follow-up Treatment



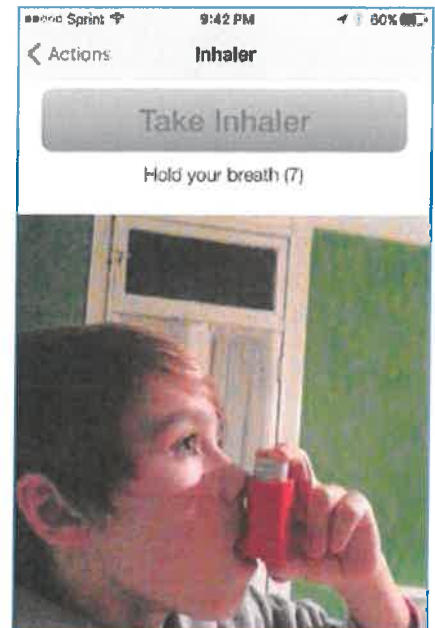
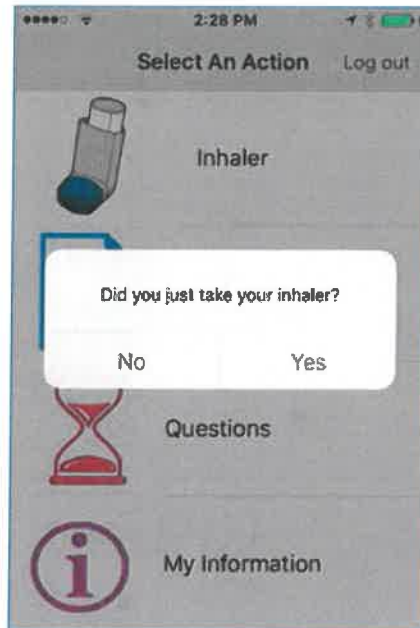
Patients prefer home-based telehealth **VS.** face-to-face treatment



Smart Phone Asthma Monitoring System (SAMS)

The Smart Phone Asthma Monitoring System (SAMS) was developed with input from asthmatic children and their parents to ensure quality follow-up care for children hospitalized with severe asthma.

SAMS syncs Bluetooth-enabled controllers and rescue inhalers and transmits summarized usage data to providers. Children are shown how to properly use their inhalers and record a video so that their technique is evaluated by a registered respiratory therapist. SAMS is currently being evaluated in Charleston and Columbia.



Smartphone Medication Adherence to Stop Hypertension (SMASH)

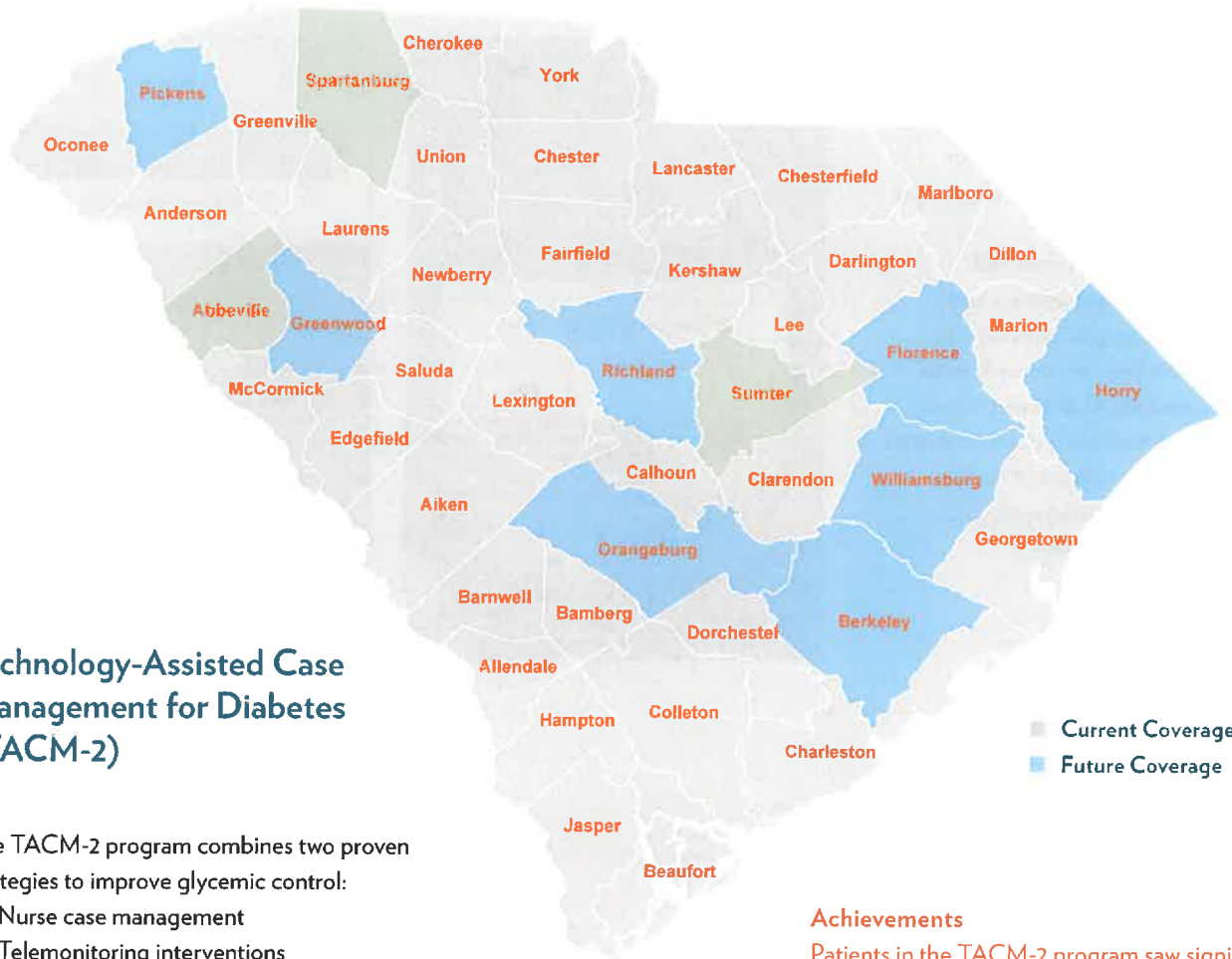
The SMASH program assists stroke victims by utilizing mobile technologies that allow patients to self manage medications and health status. This information is directly linked with their provider, allowing timely adjustments in their treatment.

This program is an innovative way to:

1. Help enhance patients' abilities to self manage their medications and health status
2. Enable providers to stay informed of their patients' adherence levels and associated blood pressure levels
3. Make timely changes in medical regimens

94%
of the SMASH patients compared to 41% of the patients receiving standard care exhibited controlled blood pressure

Remote Home Monitoring *(continued)*



Technology-Assisted Case Management for Diabetes (TACM-2)

The TACM-2 program combines two proven strategies to improve glycemic control:

1. Nurse case management
2. Telemonitoring interventions

The program provides a practical and sustainable system of diabetes management that helps low-income patients achieve and maintain goals within established treatment guidelines regardless of geographic location.

Achievements

Patients in the TACM-2 program saw significant achievements in the following:

- Glycemic control
- Blood pressure
- Ability to self monitor glucose
- Knowledge of diabetes management

6,000

The number of diabetic patients across South Carolina TACM-2 plans to reach by 2017

Telehealth Education

Palmetto Care Connections (PCC)

The primary focus of PCC is to coordinate existing telehealth activities and expand successful models, such as the South Carolina Department of Mental Health Telepsychiatry program and the MUSC Health TeleStroke program. PCC aims to develop new telehealth applications, assist providers in navigating the process of implementing telemedicine, advocate for reimbursement by all payers and serve as a resource of telehealth information for South Carolinians.



The 4th Annual Telehealth Summit of South Carolina

200+

Telehealth Summit Attendees

800+

Hours of continuing Education Credits Earned



2015 Telehealth Award Winners

Telehealth Champion
Roger Poston, Ed.D

Telehealth Program of Excellence
SCDMH Telepsychiatry Program

Telehealth Community Innovator
Gaye Douglas, DNP, APRN-BC

Telehealth Advisory Council

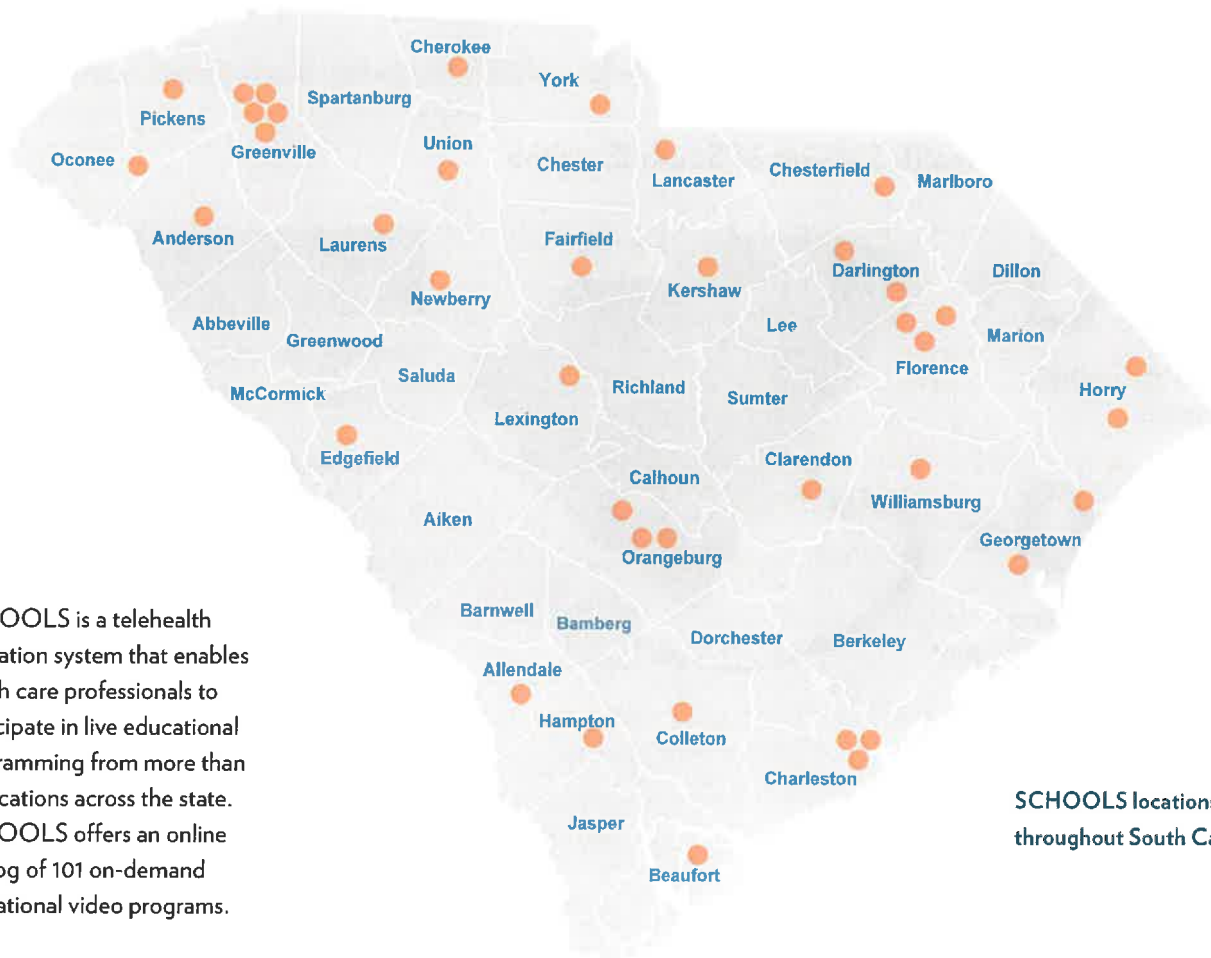
- SC Department of Health & Human Services (DHHS)
- SC Blue Cross & Blue Shield (SCBCBS)
- Greenville Health System (GHS)
- Palmetto Health
- SC Primary Health Care Association (SCPHCA)
- Rural hospital and health clinics
- School-based telehealth centers
- SC Office of Rural Health (SCORH)
- SC Hospital Association (SCHA)
- MUSC Health
- University of SC School of Medicine (USC)
- Area Health Education Consortium (AHEC)
- Palmetto State Providers Network (PSPN)
- SC Department of Mental Health (SCDMH)

Telehealth Education *(continued)*

South Carolina Area Health Education Consortium (AHEC)

In July of 2015, The Office for Telehealth Education was established as a partnership between South Carolina AHEC and MUSC Center for Telehealth to support statewide telehealth education for the state of South Carolina.

The South Carolina Health Occupations Outreach Learning System (SCHOOLS)



SCHOOLS locations throughout South Carolina

SCHOOLS is a telehealth education system that enables health care professionals to participate in live educational programming from more than 40 locations across the state. SCHOOLS offers an online catalog of 101 on-demand educational video programs.

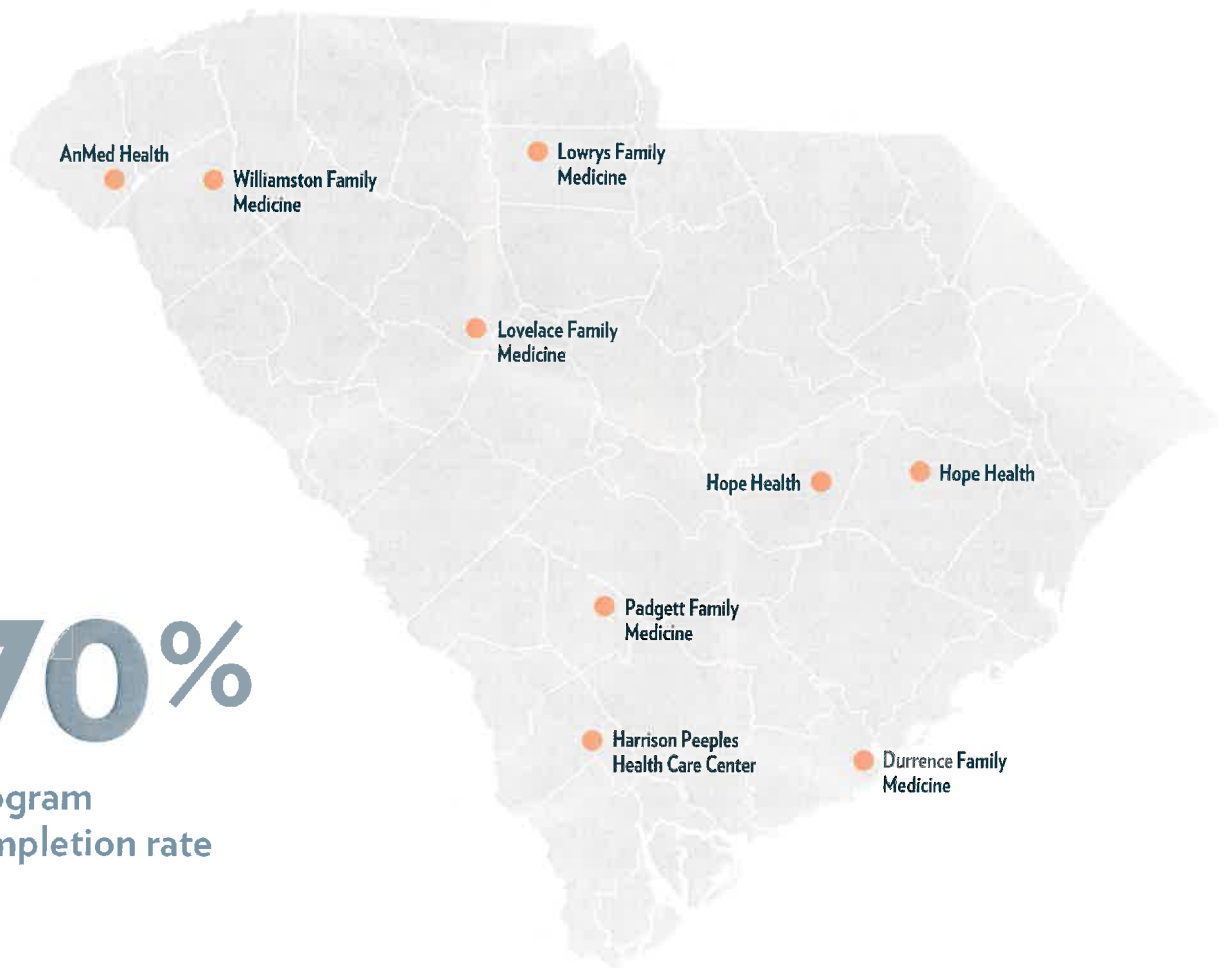
Since 2011, **3,900** providers have participated in **7,083** hours of education

Weight Management

Wellness Connect Locations

Wellness Connect is a four-month weight loss program that provides group counseling for weight management. Participants meet at their physician's office and connect via telehealth to weight management experts every other week for one-hour sessions.

In addition to group sessions, an app tracks weight loss and success measurements that are reported to the weight management experts allowing patients to get help along the way.



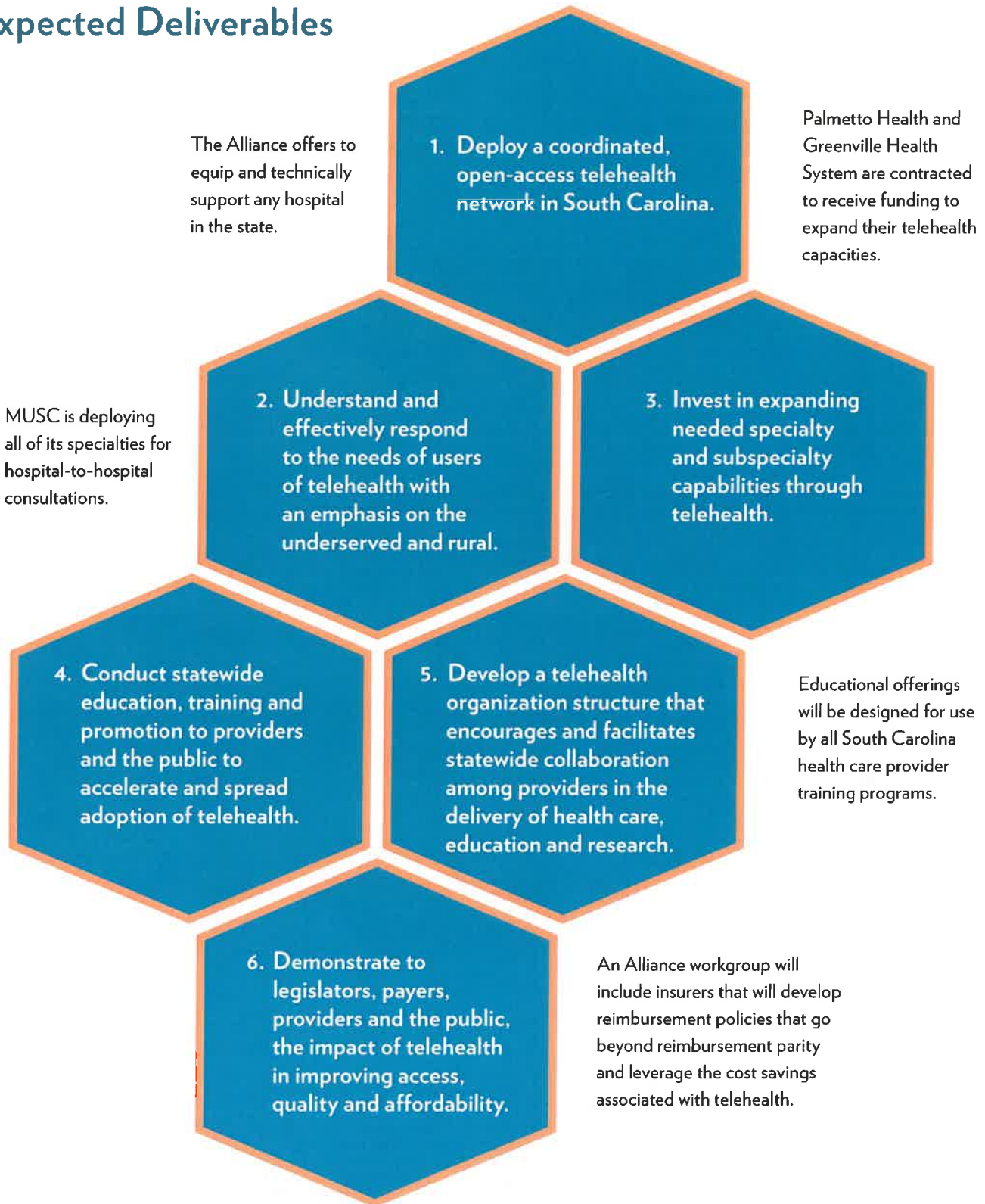
70%

Program completion rate

93%

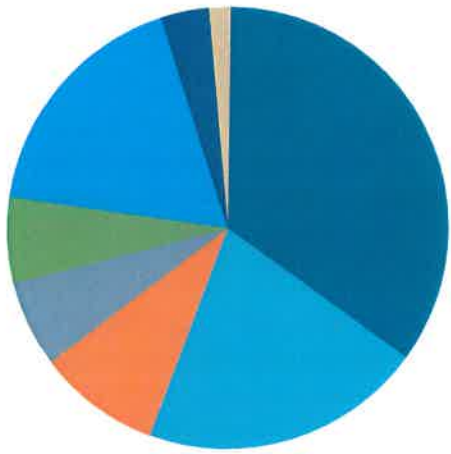
of patients that indicated they were satisfied with Wellness Connect and would recommend it to others

SCTA Strategies and Expected Deliverables

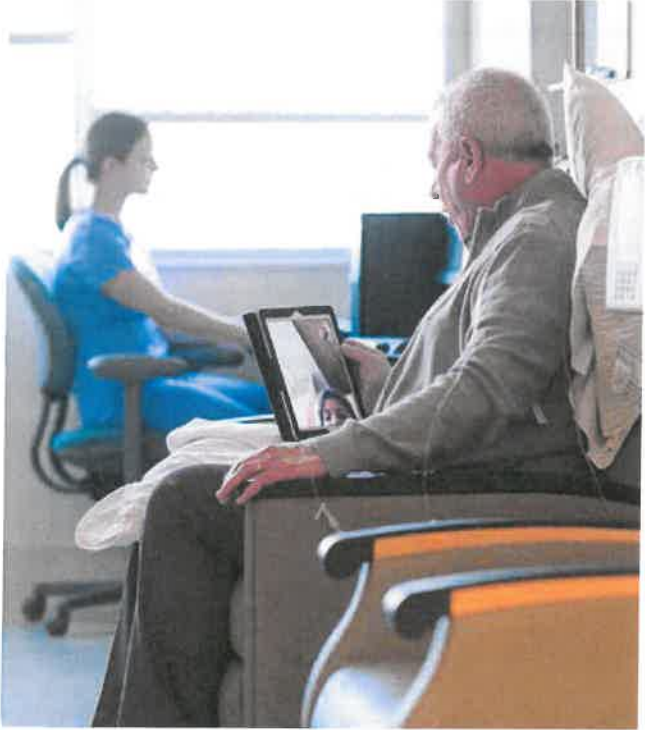


Fund Allocation and Expenditures

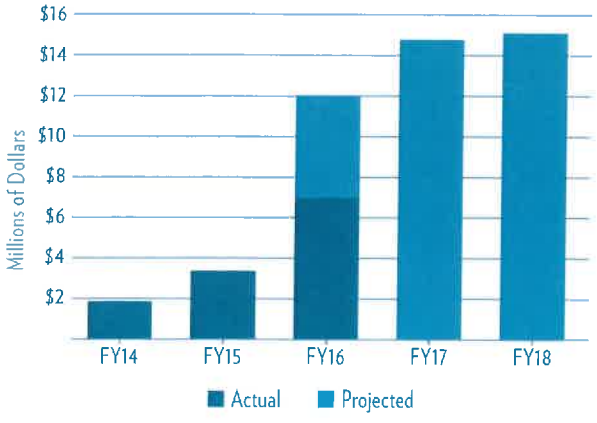
Allocation of Funds for the First 26 Months of Operations



- Center for Telehealth Operations & Personnel
- Network Infrastructure – Hardware & Software
- Regionally-based Hub Support
- Marketing & Outcomes Reporting
- mHealth Initiatives
- Clinical Capacity Development
- Rural Site Support (Palmetto Care Connections)
- Office of Telehealth Education



Actual Expenditures and Projected Expenses



South Carolina: A National Leader in Advancing Telehealth

South Carolina Telehealth Publications in 2015

Buchanan, A., Datta, S., Skinner, C., Hollowell, G., Beresford, H., Freeland, T., Rogers, B., Boling, J., Marcom, PK., Adams, M. (2015). Randomized Trial of Telegenetics vs. In-Person Cancer Genetic Counseling: Cost, Patient Satisfaction and Attendance. *Journal of Genetic Counseling*, 961-970.

Davidson T.M., McGillicuddy J., Mueller M., Brunner-Jackson B., Favella A., Anderson A., Torres M., Ruggiero K.J., Treiber F.A. (2015). Evaluation of an mHealth Medication Regimen Self-Management Program for African American and Hispanic Uncontrolled Hypertensives. *Journal of Personalized Medicine*, 17;5(4):389-405.

Davidson, T.M., Yuen, E.K., McCauley, J., Gros, K.S. & Ruggiero, K.J. (2015). Feasibility assessment of a brief, web-based behavioral activation interventions for adolescents with depressed mood. *Omega*, 70(1), 69-82.

Egede, L., Acierno, R., Knapp, R., Lejuez, C., Hernandez-Tejada, M., Payne, E., & Frueh, B. (2015). Psychotherapy for depression in older veterans via telemedicine: a randomised, open-label, non-inferiority trial. *Lancet Psychiatry*, 693-701.

Jackson, D.D., Owens, O.L., Friedman, D.B., DuBose-Morris, R. (2015). Innovative and community-guided evaluation and dissemination of a prostate cancer education program for African-American men and women. *Journal of Cancer Education*, 30(4), 779-785.

McGillicuddy J.W., Taber D.J., Mueller M., Patel S., Baliga P.K., Chavin K.D., Sox L., Favela A., Brunner-Jackson B., Treiber F.A. (2015). Sustainability of improvements in Medication Adherence through a mobile health intervention. *Progress in Transplantation*, 25(3):217-23. PMID:2630878

Ovbiagele B., Jenkins C., Patel S., Brunner-Jackson B., Anderson A., Saulson R., Treiber F.A. (2015). Mobile health medication adherence and blood pressure control in recent stroke patients. *J Neuro Sci*. Nov 15;358(1-2):535-7. PMID:26463572

Pelton, D., Wangelin, B., Tuerk, P. (2015). Utilizing telehealth to support treatment of acute stress disorder in a theater of war: Prolonged exposure via clinical videoconferencing. *Telemedicine and e-Health*, 5(1), 382-387.

Price, M., Kuhn, E., Hoffman, J.E., Ruzek, J. & Acierno, R., (2015). Comparison of the PTSD Checklist (PCL) administered via a mobile device relative to a paper form. *Journal of Traumatic Stress*, 28(5), 480-483.

Shane-McWhorter, L., McAdam-Marx, C., Lenert, L., Peterson, M., Woolsey, S., Coursey, J.M., Whittaker, T.C., LaMarche, D., Carroll, P., Chuy, L. (2015). Pharmacist-provided diabetes management and education via a telemonitoring program. *Journal of the American Pharmacists Association*, 55(5), 516-526.

Shealy, K.M., Davidson, T.M., Jones, A.M., Lopez, C.M., de Arellano, M.A. (2015). Delivering an evidence-based mental health treatment to underserved populations using telemedicine: The case of a trauma-affected adolescent in a rural setting. *Cognitive and Behavioral Practice*, 22(3), 331-344.

Sieverdes, J., Nemeth, L., Magwood, G., Baliga, P., Chavin, K., Brunner-Jackson, B., Patel, SK., Ruggiero, K.J., Treiber, F. (2015). Patient-Centered mHealth Living Donor Transplant Education Program for African Americans: Development and Analysis. *JMIR Research Protocols*, e84.

Sieverdes J., Raynor P.A., Armstrong T., Jenkins C.H., Sox L.R., Treiber F.A. (2015). Attitudes and perceptions of kidney transplantation wait-listed patients toward mobile health delivered physical activity programs. *Progress in Transplantation*, 25(1):26-34. doi: 10.7182/pit2015884.PMID:25758797.

Switzer, J., Singh, R., Mathaissen, L., Waller, J., Adams, R., & Hess, D. (2015). Telestroke: variations in intravenous thrombolysis by spoke hospitals. *Journal of stroke and cerebrovascular diseases*, 739-744.

Yuen, E.K., Gros, D.F., Price, M., Zeigler, S., Tuerk, P.W., Foa, E.B., Acierno, R. (2015). Randomized controlled trial of home-based telehealth versus in-person prolonged exposure for combat-related PTSD in Veterans: Preliminary results. *Journal of Clinical Psychology*, 6(1), 500-512.

2015 Telehealth Innovation and Development Grant Recipients

Grant awards were made to spur innovation in telehealth for the state of South Carolina. The awards focused on programs that have potential to be sustainable, save costs while improving care, are scalable to the state as a whole and are in line with the health care needs of South Carolina.

Zeriscope is Changing What's Possible in PTSD Treatment

Using wearable technologies to treat PTSD

Robert Adams, M.D.

Pilot Study to Guide Refinement of a Scalable, Sustainable Intervention for Adolescents after Traumatic Injury

Using telehealth to follow-up with trauma-exposed youth at risk for depression

Kenneth Ruggiero, Ph.D.

The Smart Phone Asthma Monitoring (SAM) System: Addressing the Pediatric Asthma Crisis in SC with Telehealth

Allowing patients to monitor asthma with smartphones

Ronald Teufel, M.D.

Redefining Home Visits with Technology

Communicating with pregnant women in their homes

Donna Johnson, M.D.

Initial User-Centered Design of an Adaptive Mobile Telehealth System to Promote Effective Disease Self-Management: A Mixed-Method Key Informant Study

Creating a technology-based, disease self-management system

Zachary Adams, Ph.D.

Tele-Wound Care

Connecting community physicians to skilled nursing using telehealth

George Wilkinson, M.D.

Grant Review Panel Representation

- Palmetto Care Connections
- South Carolina Hospital Association
- Greenville Health System
- Department of Mental Health
- Georgetown Pediatric Center
- Medical University of South Carolina
- South Carolina Clinical & Translation Research Institute

SOUTH CAROLINA
Telehealth
ALLIANCE

sctelehealth.org

**Medical University Hospital Authority
Telehealth Expenditures and Projected Budget**

	FY14	FY15	FY16 (July-Jan)	FY16 (Feb-June)	FY17	FY18	Total
Center for Telehealth Operations & Personnel							
Center Personnel	\$206,120.33	\$714,285.71	\$818,601.03				
Supplies-Printing-Misc	\$9,363.84	\$20,648.11	\$33,849.91				
Telephone, Cellular, Fax	\$2,459.20	\$10,926.55	\$10,191.83				
Education and Travel	\$21,624.30	\$90,241.96	\$49,918.26				
Facility	\$1,600.00	\$63,764.80	\$84,744.01				
State Strategic Plan Consultant	\$91,393.32	\$46,747.76					
Training and Simulation Center			\$2,000,000.00				
Total	\$332,560.99	\$946,614.89	\$2,997,305.04	\$1,036,194.96	\$5,100,000.00	\$5,300,000.00	\$15,712,675.88
Network Infrastructure- Hardware & Software							
Hardware	\$66,881.85	\$264,070.36	\$251,812.36				
Software	\$152,182.51	\$148,723.69	\$228,917.95				
Tele-ICU Operations Center	\$325,000.00	\$19,302.00					
Telestroke Support for Hospitals (REACH)	\$400,788.16	\$421,392.11	\$256,000.00				
Total	\$944,852.52	\$853,488.16	\$736,730.31	\$463,270.00	\$1,875,000.00	\$1,875,000.00	\$6,748,340.99
Regionally-based Support							
Rural Site Telepresenters		\$4,153.00					
Regionally-based Hub Support			\$800,000.00				
Community Hospital Support			\$300,000.00				
Total		\$4,153.00	\$1,100,000.00		\$2,000,000.00	\$2,000,000.00	\$5,104,153.00
Marketing & Outcomes Reporting							
SCTA Campaign		\$541,237.27					
Marketing materials			\$7,526.40				
SCTA Campaign (SCETV)			\$155,000.00				
Outcomes Reporting (personnel)		\$15,369.00	\$60,843.38				
Total		\$556,606.27	\$223,369.78	\$226,630.22	\$550,000.00	\$550,000.00	\$2,106,606.27
mHealth Initiatives							
Rural Diabetes Initiative	\$284,304.00	\$282,304.00					
Stroke Readmissions Reduction Initiative	\$100,000.00	\$100,000.00					
Total	\$384,304.00	\$382,304.00		\$550,000.00	\$550,000.00	\$550,000.00	\$2,416,608.00
Clinical Capacity Development							
Physician Leadership/Service Development	\$88,120.71	\$364,309.86	\$833,614.29				
Weight Management (Obesity Initiative)	\$74,295.00	\$84,630.00					
Innovation and Development Grants		\$15,000.00	\$130,000.00				
Tele-ICU Support for Hospitals			\$585,830.25				
Total	\$162,415.71	\$463,939.86	\$1,549,444.54	\$2,650,555.46	\$4,100,000.00	\$4,100,000.00	\$13,026,355.57
Rural Site Support							
Palmetto Care Connections	\$53,000.00	\$215,500.00	\$162,500.00				
Total	\$53,000.00	\$215,500.00	\$162,500.00	\$162,500.00	\$350,000.00	\$400,000.00	\$1,343,500.00
Office of Telehealth Education							
SC AHEC		\$10,193.00	\$181,531.66				
Total		\$10,193.00	\$181,531.66		\$350,000.00	\$400,000.00	\$941,724.66
TOTAL	\$1,877,133.22	\$3,432,799.18	\$6,950,881.33	\$5,089,150.64	\$14,875,000.00	\$15,175,000.00	\$47,399,964.37

