



Digital Innovations to Support Rural Health and Health Equity: Research and Program Highlights from MUSC's Telehealth Center of Excellence

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CTRC 2024 Summit

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Acknowledgments

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Agenda

- Overview of MUSC National Telehealth Center of Excellence
- Program & research highlights:
 - Telehealth supporting rural hospital sustainability
 - Rural telehealth workforce development
 - Telehealth-enabled integration of behavioral health in primary care
 - Digital tools supporting perinatal behavioral health
- Q&A

MUSC Center for Telehealth





MUSC Center for Telehealth History

SOUTH CAROLINA
Telehealth
ALLIANCE



2005-2009
Maternal Fetal
Telemedicine,
Telstroke, ICU,
Telepsych, SBH

2013
State of SC
telehealth
investment; MUSC
Center for
Telehealth founded

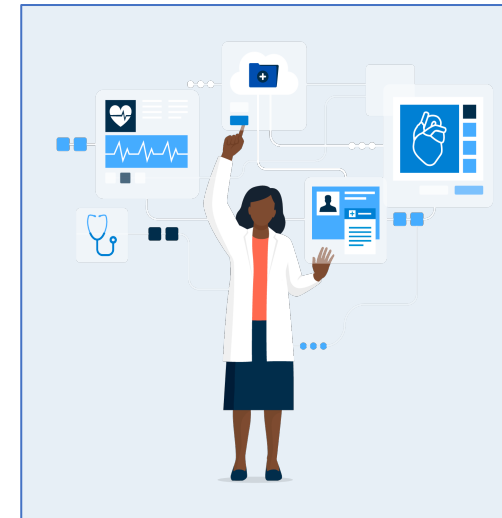
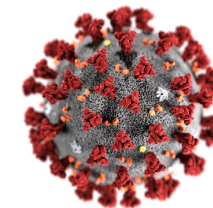
2014
SCTA founded;
headquartered at
MUSC

2017
Designated by
HRSA as a
National
Telehealth
Center of
Excellence

2019
Awarded ATA's
President's
Award for
Transformation
of Health Care
Delivery (SCTA)

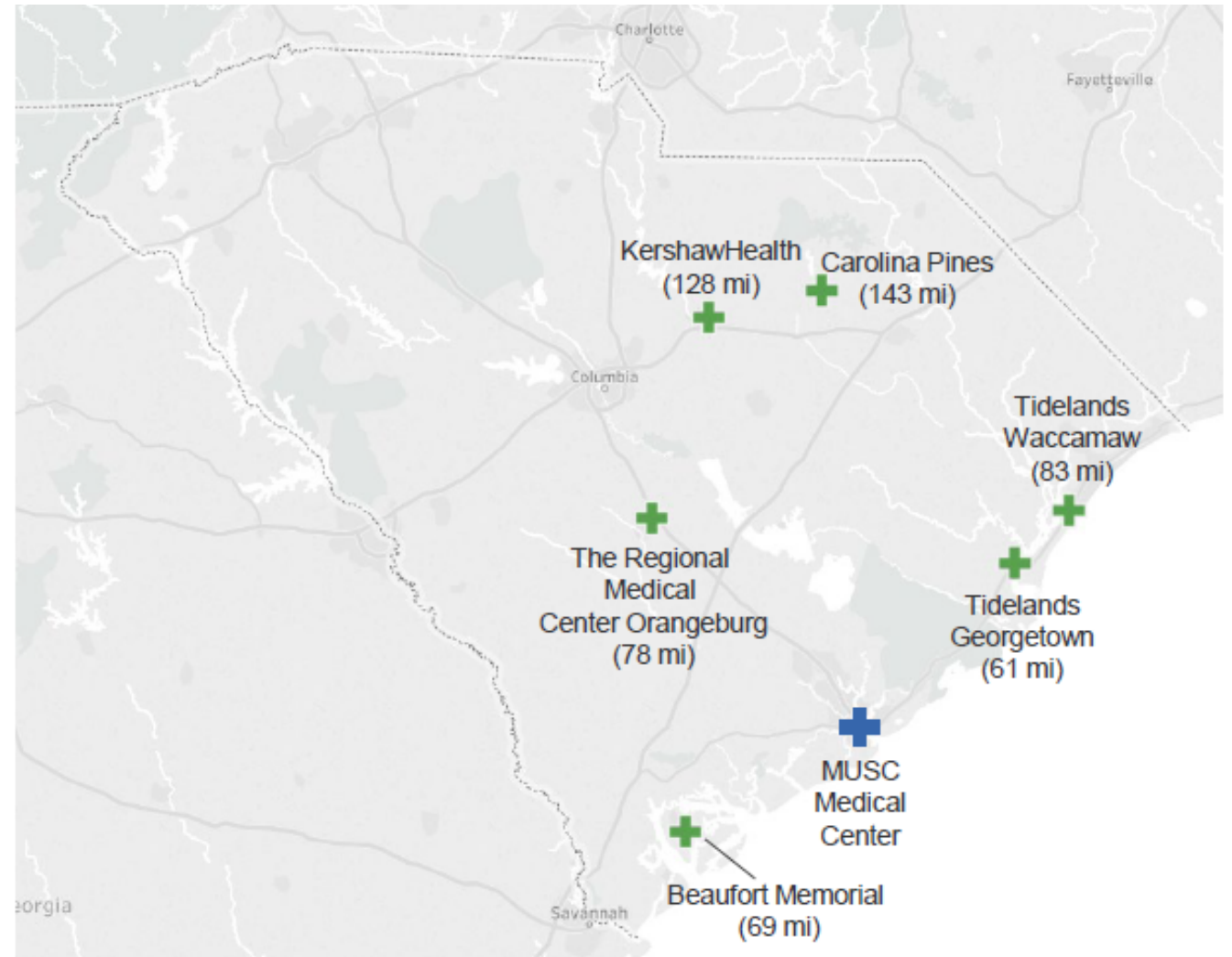
2020 - 2021
Explosive
growth of
telehealth in
ambulatory
space due to
COVID-19

2022 - current
Building a virtual
ecosystem for the
future



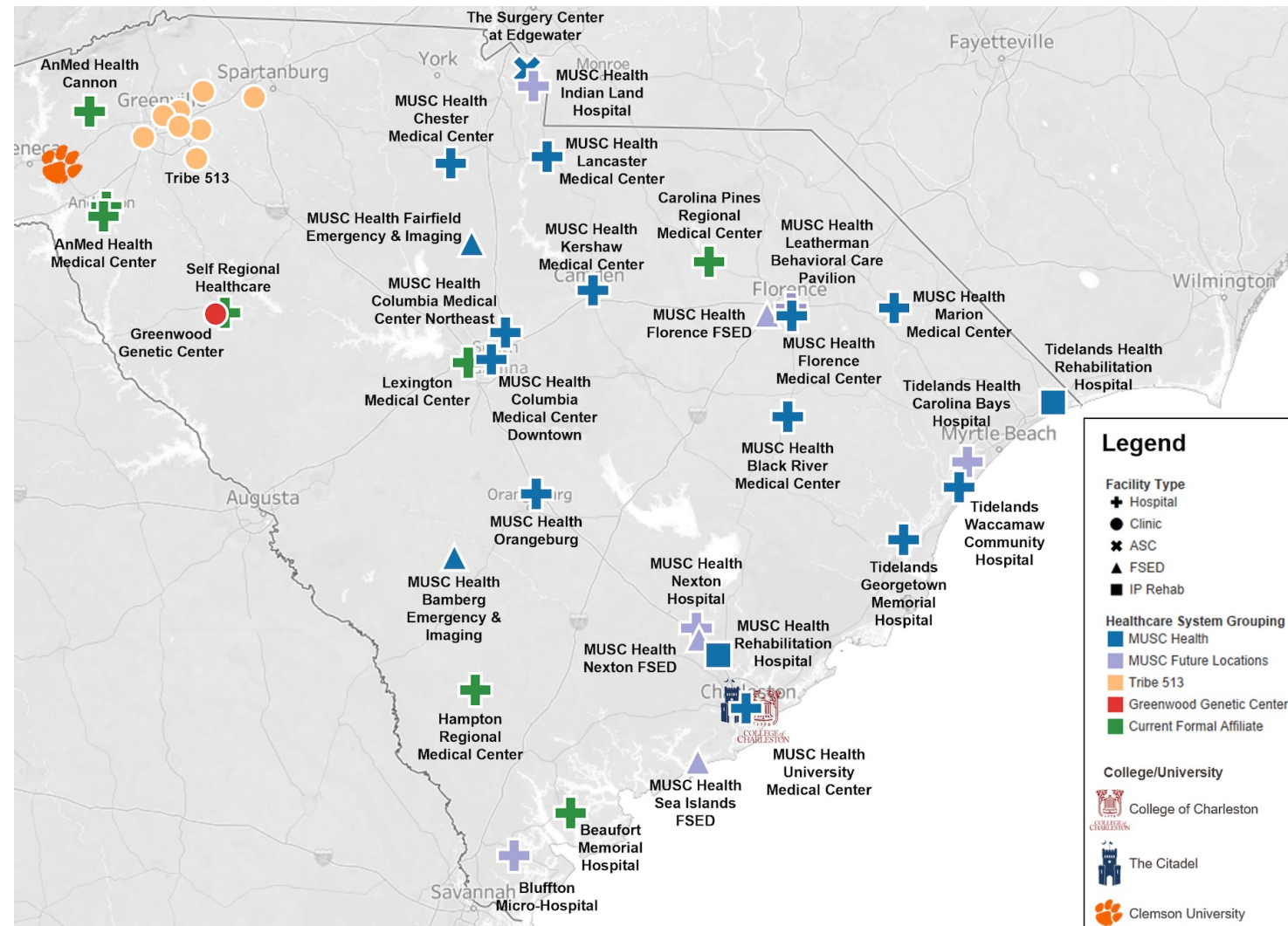
MUSC Health 2016

- 1 hospital located in Charleston, SC
- 800-beds
- 6 formal affiliates



MUSC Health 2024

- 16 hospitals (owned or governing interest)
- 2,700 beds and four additional hospital locations in development
- 350 telehealth sites
- 750 care locations situated in all regions of South Carolina.
- 6 formal affiliates



MUSC Virtual Care Ecosystem: FY24

Ambulatory

Extend MUSC brand, improve access, offer convenient care

% virtual, capacity management, patient satisfaction, access equity, timeliness, value-based performance, new patient capture, patient engagement & retention

- + - Integration status
- Technology partnership
- Service type
- Service description
- Service impact



Inpatient

Improve access to specialty care and improve hospital-based outcomes

LOS, cost of care, severity adjusted mortality, Leapfrog, core measures, bundle adherence, nursing quality metrics

Population Health

Improve care equity for safety net populations and improve value-based care performance

HTN control, A1c control, ED visits, readmissions, behavioral health therapy compliance, infant well visit compliance



MUSC Telehealth Center of Excellence

- Goal of COEs: Fill important gaps in the national telehealth landscape through a combination of ongoing regional and national collaborations, as well as proactive dissemination of telehealth resources
- Since 2017, the COE has produced:
 - > 128 peer-reviewed publications
 - > 277 national telehealth presentations
 - > 320 technical assistance consultations, including 20+ site visits and 12 technical assistance documents
- Over 60 faculty and staff supported to investigate nearly 40 subprojects



Y4 MUSC COE Projects

Rural Hospitals

Digital ICU Innovations program

Rural hospital telehealth support models

ICU recovery clinic

Evaluation of telehealth palliative care

Primary Care

Smoking cessation & COPD screening

Determine feasibility of OUD treatment using telehealth strategies

Primary care integrated weight management

Collaborative Care among rural primary care practices

Virtual monitoring of pediatric ADHD

Maternal Health

Behavioral health for peripartum women

Population Health & Health Equity

School-based tele-behavioral health

Telehealth strategies for people experiencing homelessness

Pediatric telemental health for trauma

Healthcare Workforce

Virtual Nursing, Virtual Specialty Practice, and Virtual ED

Mental health support for health care workers

Telehealth workforce impact leadership convening and report

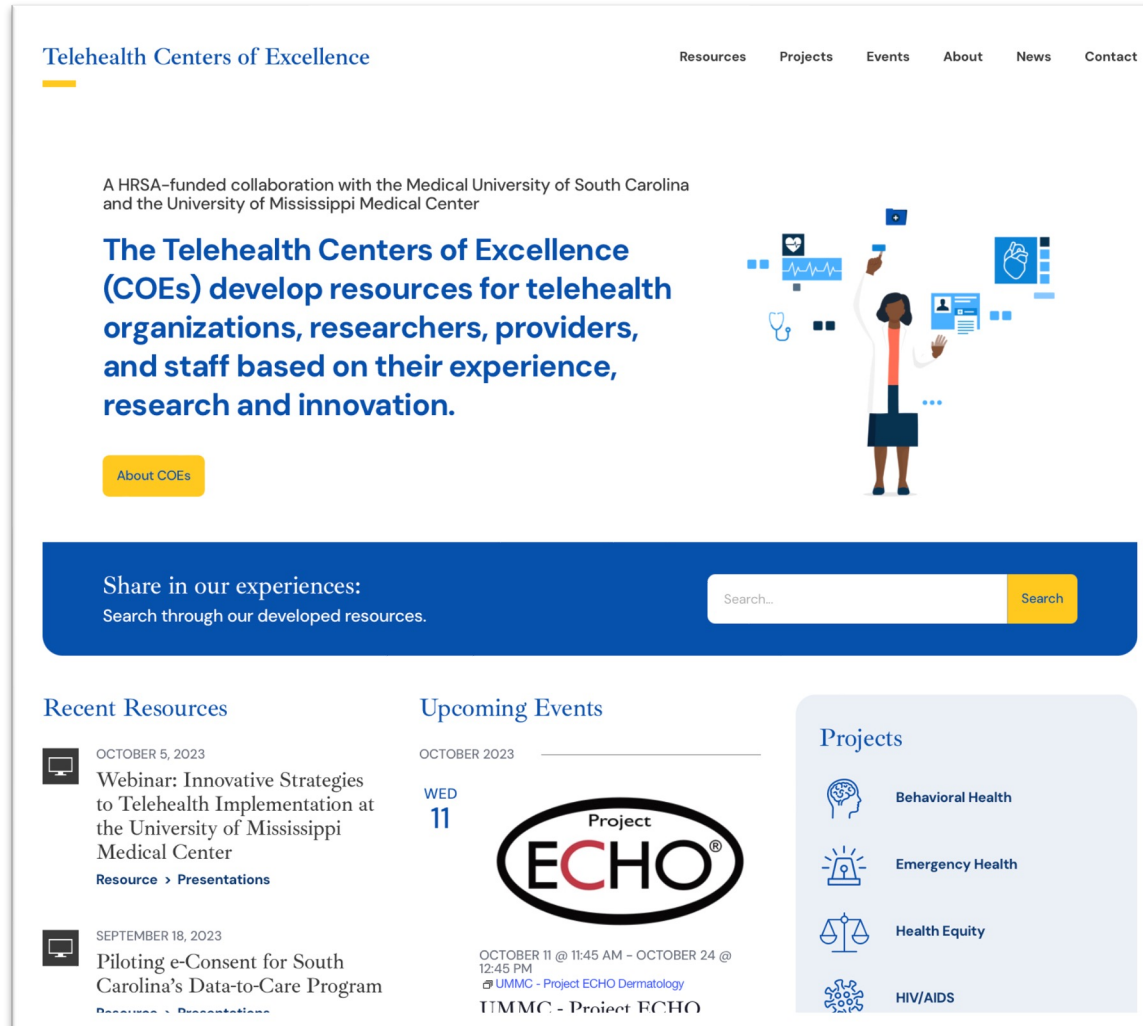
Telehealth Research Methods

Conducting remote trials

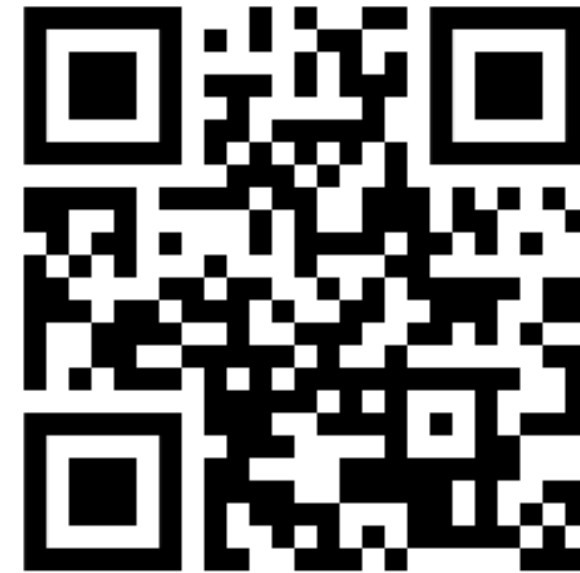
Telehealth and data aggregation methods

Technical Assistance & National Engagement

Join COE Website and Newsletter



The screenshot shows the homepage of the Telehealth Centers of Excellence website. At the top, there is a navigation menu with links for Resources, Projects, Events, About, News, and Contact. The main heading reads "Telehealth Centers of Excellence" followed by a sub-heading: "A HRSA-funded collaboration with the Medical University of South Carolina and the University of Mississippi Medical Center". The primary message states: "The Telehealth Centers of Excellence (COEs) develop resources for telehealth organizations, researchers, providers, and staff based on their experience, research and innovation." Below this is a yellow button labeled "About COEs". A search bar is located in a blue banner with the text "Share in our experiences: Search through our developed resources." The page is divided into three sections: "Recent Resources" featuring two webinar announcements from October 5, 2023 and September 18, 2023; "Upcoming Events" for October 2023, highlighting "Project ECHO" on Wednesday, October 11, from 11:45 AM to 12:45 PM, with locations at UMMC - Project ECHO Dermatology and UMMC - Project ECHO; and "Projects" including Behavioral Health, Emergency Health, Health Equity, and HIV/AIDS.



Scan this QR code to navigate to website and sign-up for newsletter

telehealthcoe.org



Research & Program Highlights

Guiding Questions for Building Telehealth Programs

- What is the problem we are trying to solve?
- How do we ensure equitable access to this solution?





Telehealth to Support Rural Hospital Sustainability



Rural Hospitals

- Rural Hospitals are closing and impact a community's access to healthcare
 - 136 closed in the US from 2010-2021 (6 in SC alone)
 - 27% of SC residents (1.4 million) live in rural areas
- Outmigration and/or bypassing of the local rural hospitals to bystander hospitals remains problematic and impacts a community's access to healthcare and the long-term business viability of the city
 - In 2020, rural hospitals supported 1 in 12 rural jobs in the US



Hampton Regional Medical Center (HRMC) Partnership

- 32 bed not-for-profit rural hospital located in Varnville, SC, opened in 2008
 - Primarily serves patients of Hampton and Allendale Counties, ranked 37th and 43rd, respectively (of 46), in SC's County Health Outcomes report
 - HRMC in close proximity to 2 SC counties, Bamberg & Barnwell, which experienced hospital closures over last decade
- 85% of county residents receive inpatient medical care outside their home facility resulting in occupancy rate of 30-40%
- HRMC is one of the region's largest employers with a significant economic impact that would not easily be replaced if it closed

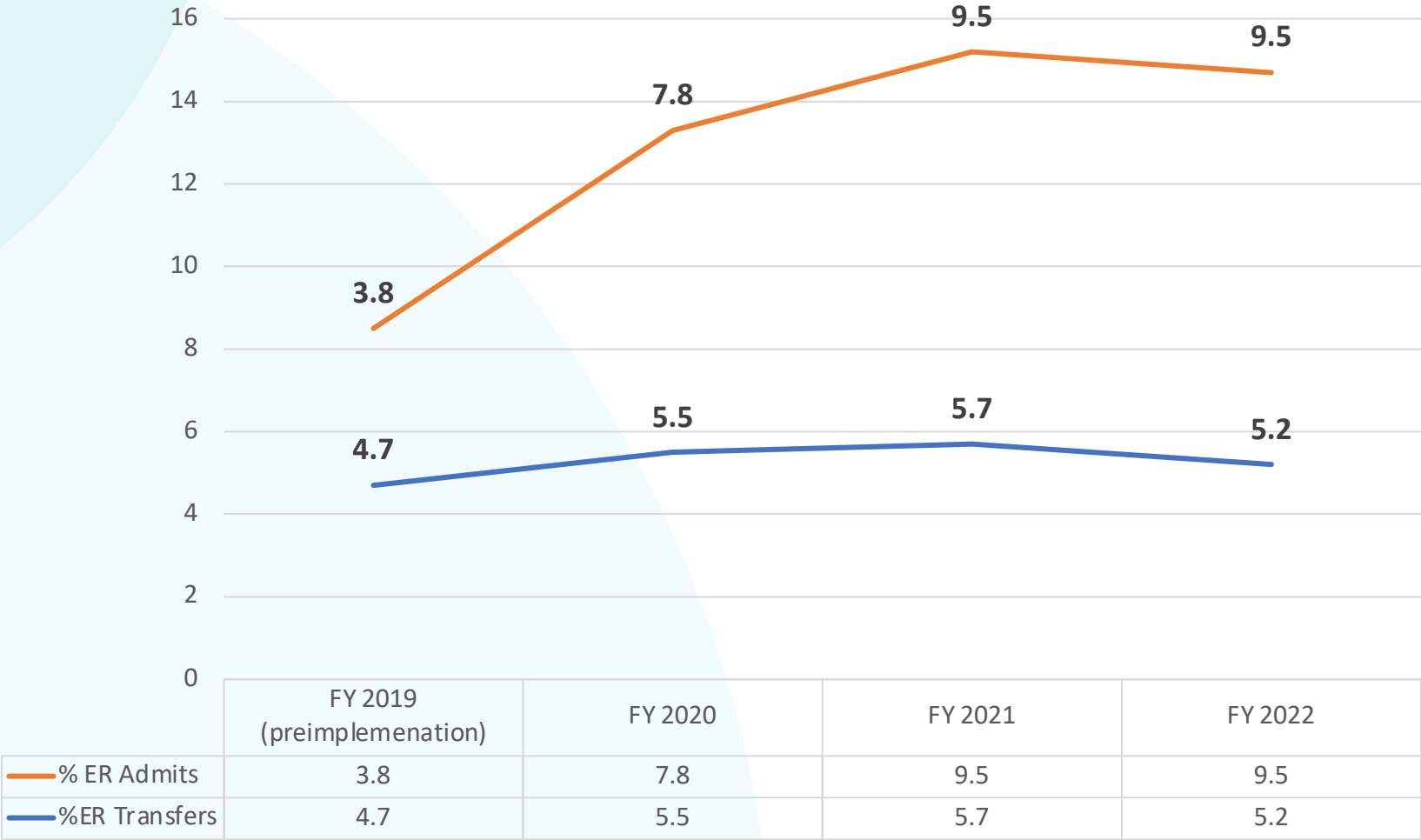


Hampton Regional Medical Center (HRMC) Partnership

- In 2019 MUSC and HRMC developed a partnership to develop a sustainable care model for HRMC with goal to keep care within the community
- Funded by SC Department of Health and Human Services
- Heavy emphasis on telehealth including:
 - Outpatient: Urology and Hem-Onc
 - Inpatient Consults: Neurology, Cardiology, Infectious Disease, ICU
 - Tele-hospitalist rounding
- Tele-hospitalists, in conjunction with onsite APP, round on ALL admitted patients daily and provide 24/7 pager coverage for any acute issues



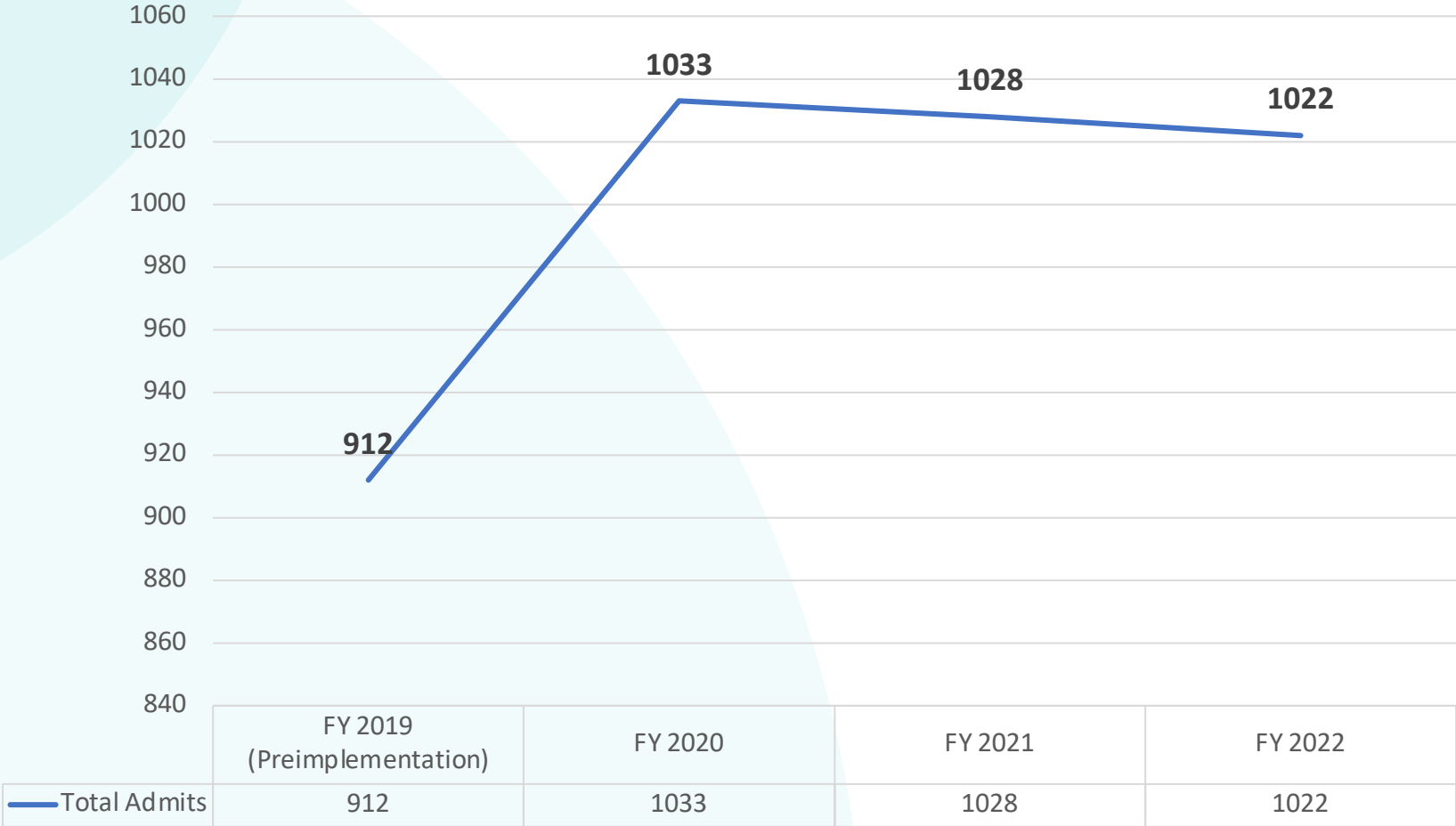
Performance Measure: ED Admits/Transfers



— %ER Transfers — % ER Admits

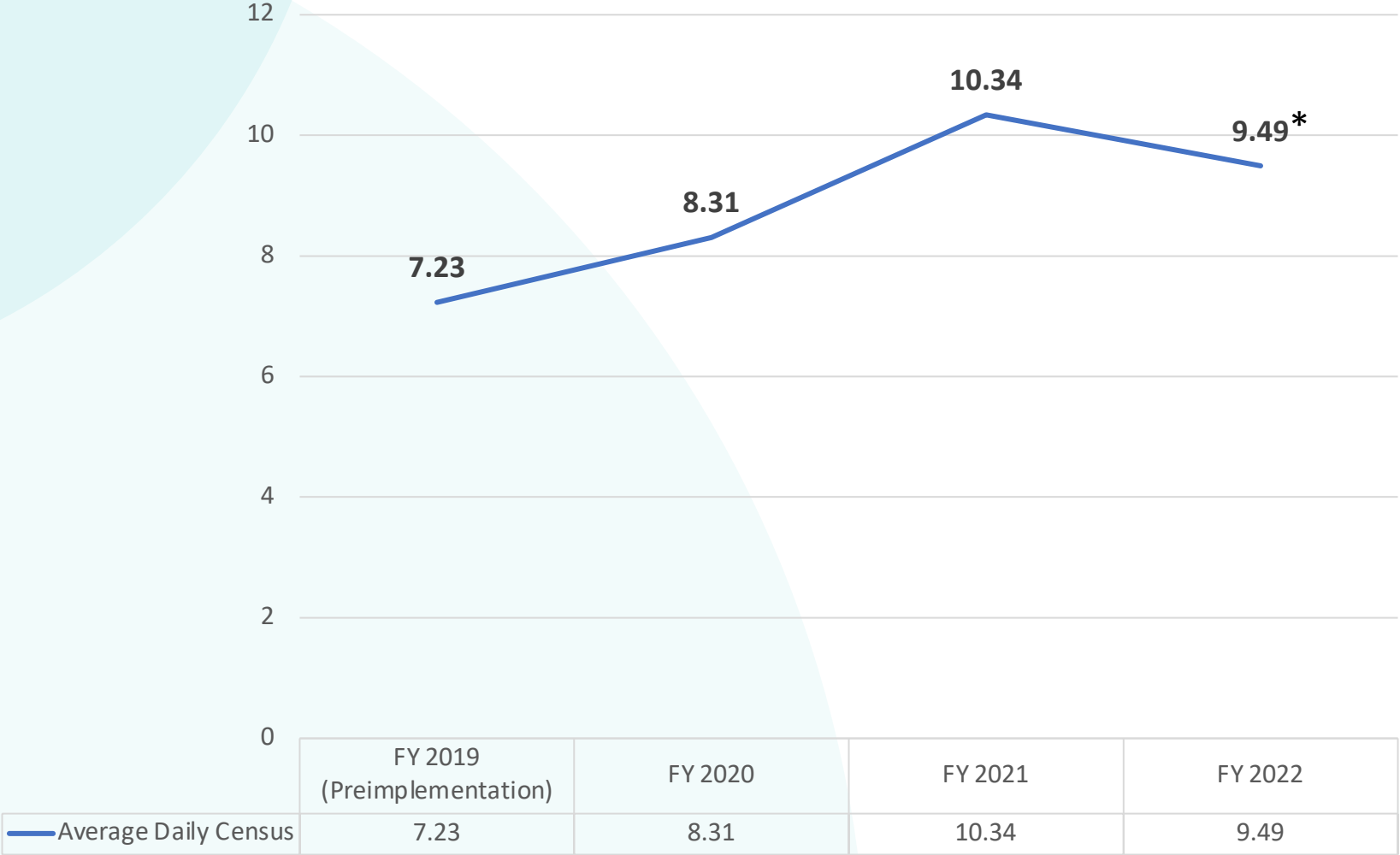
Performance Measure: Total Annual Admissions

Total Inpatient Admits



— Total Admits

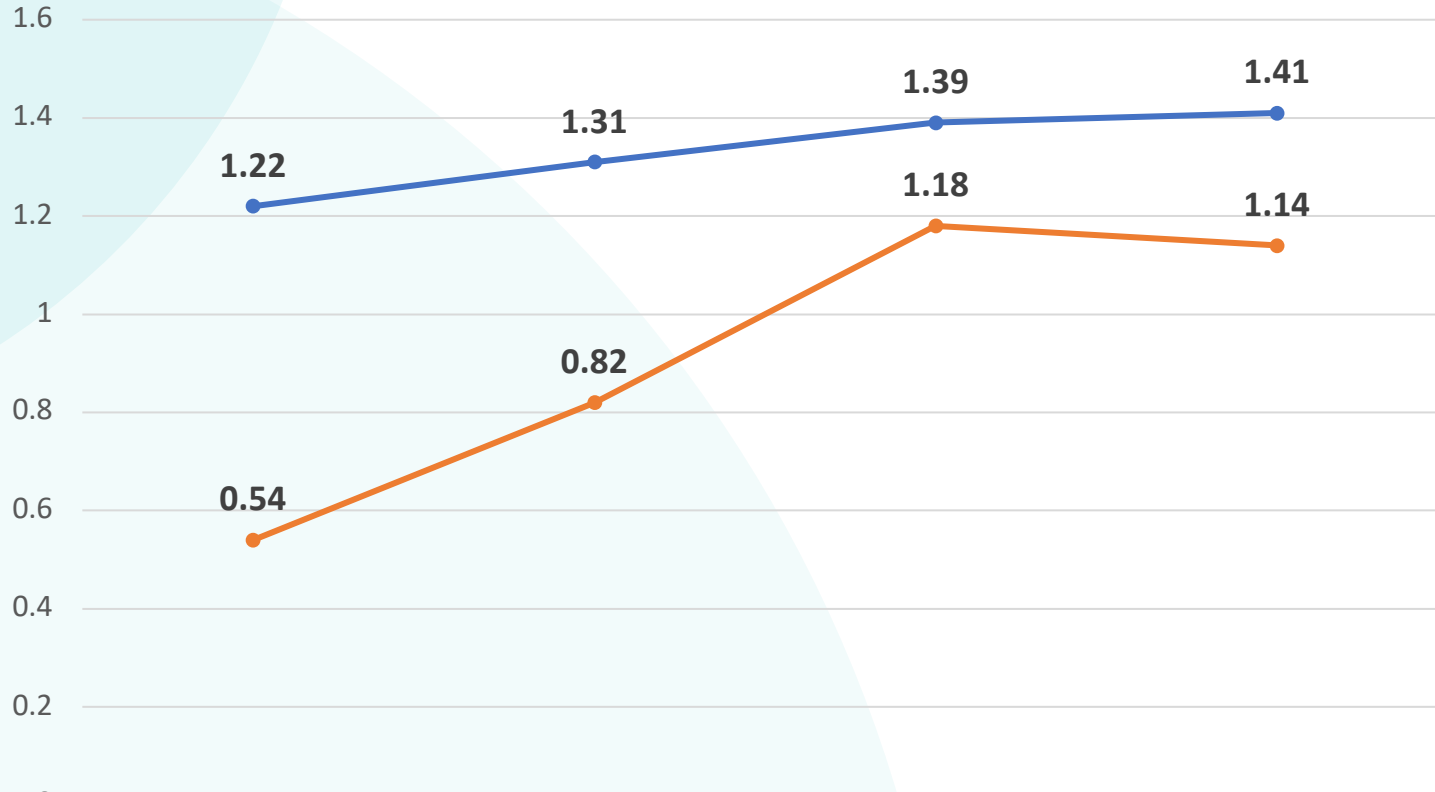
Performance Measure: Average Daily Census (ADC)



— Average Daily Census

*Limited by ancillary staff shortages

Performance Measure: Case Mix Index (CMI)



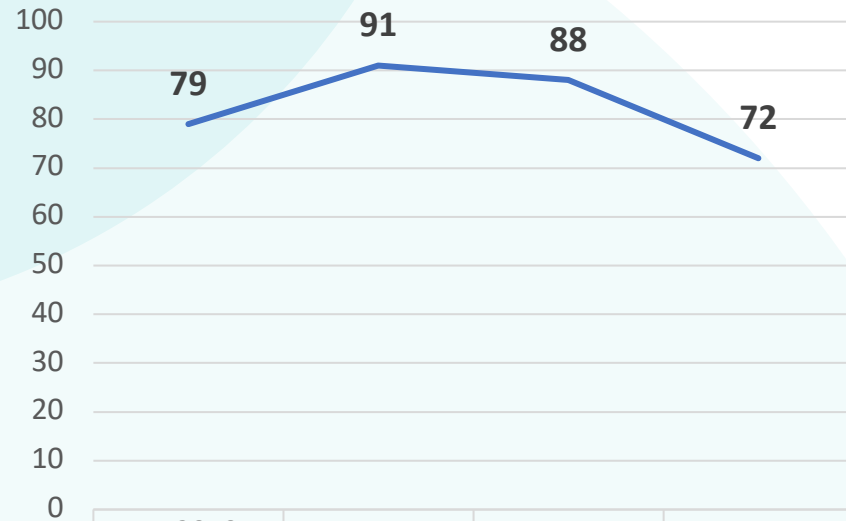
	FY 2019 (Preimplementation)	FY 2020	FY 2021	FY 2022
Case Mix Index	1.22	1.31	1.39	1.41
ADC ICU	0.54	0.82	1.18	1.14

—●— Case Mix Index —●— ADC ICU

Length Of Stay (Acute + ICU)	
FY 2019 (Pre-implementation)	3.47
FY 2020	3.71
FY 2021	4.56
FY 2022	4.78

Performance Measure: Inpatient Transfers

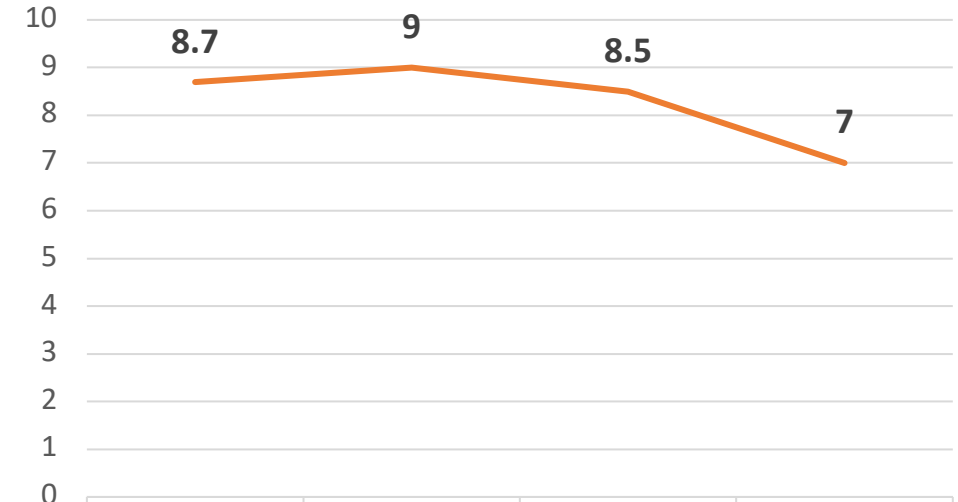
Total Inpatient transfers



	FY 2019 (Preimplementation)	FY 2020	FY 2021	FY 2022
Inpatient transfers	79	91	88	72

— Inpatient transfers

% Inpatient Transfers

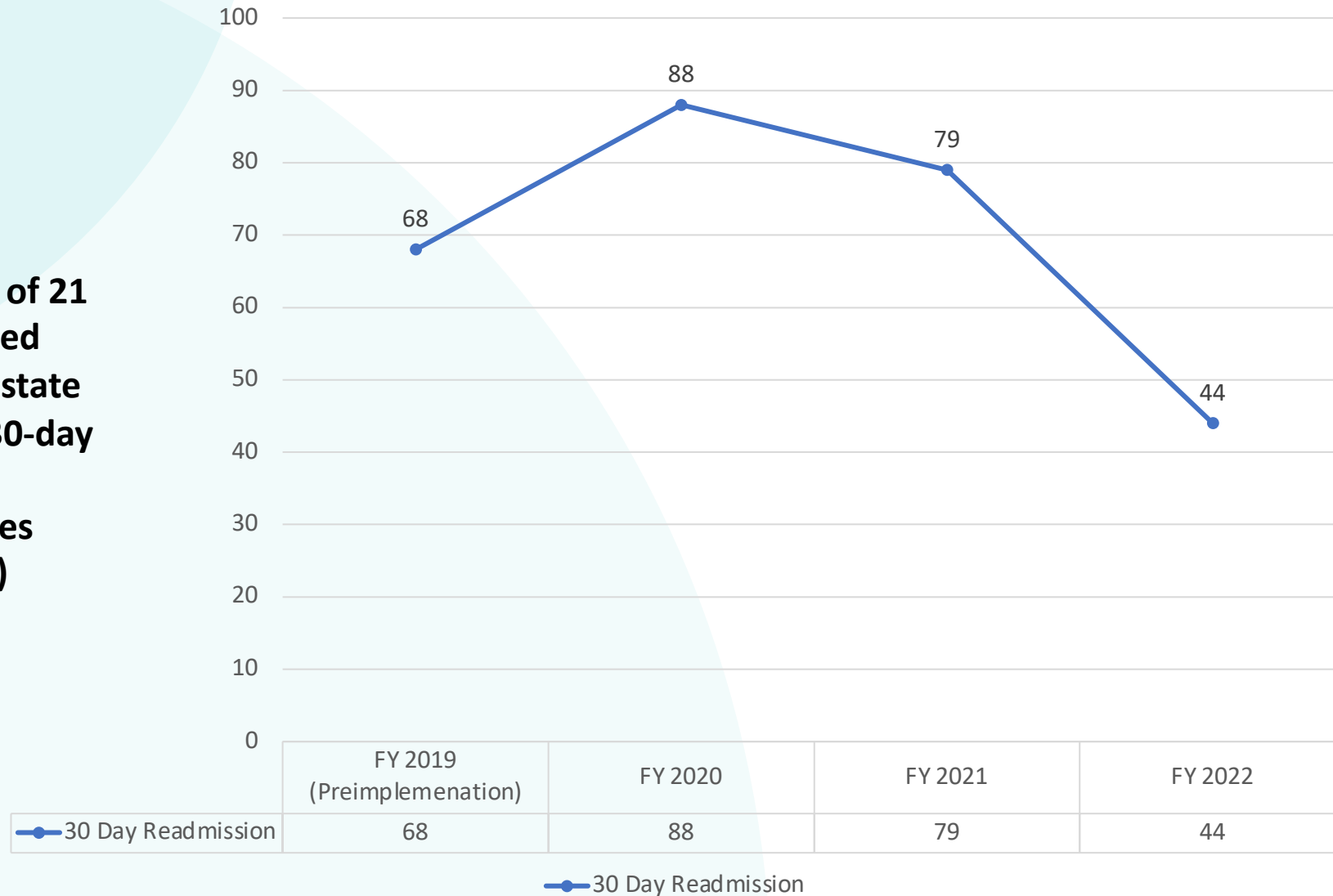


	FY 2019 (Preimplementation)	FY 2020	FY 2021	FY 2022
% Inpatient Transfers	8.7	9	8.5	7

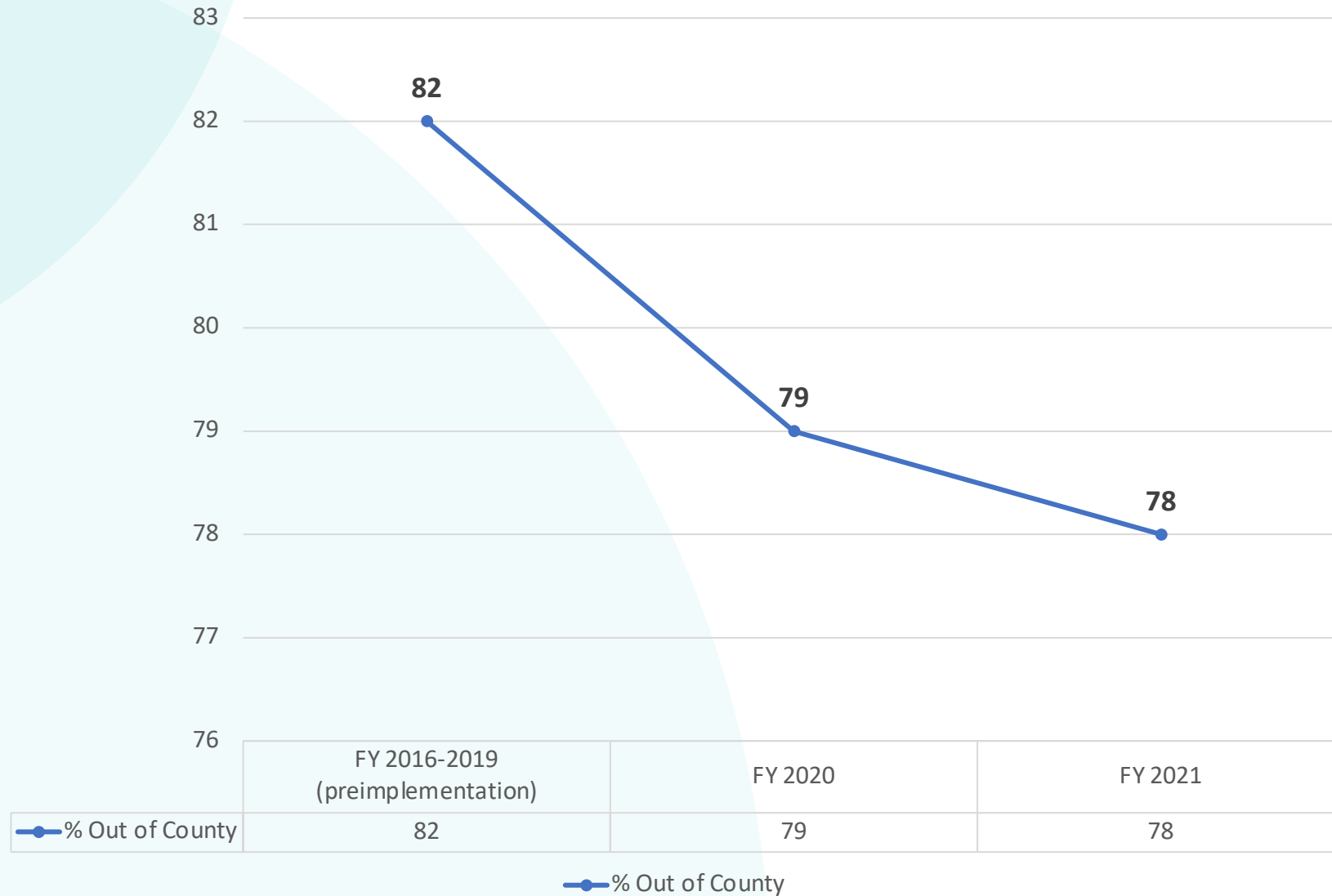
— % Inpatient Transfers

Performance Measures: 30 Day Readmissions

***Ranked #1 out of 21 other similar sized hospitals in the state for preventing 30-day readmissions (*Health Services Advisory Group)**



Performance Measures: Outmigration



*FY2022 data not yet available

Future Directions: MUSC Black River Medical Center



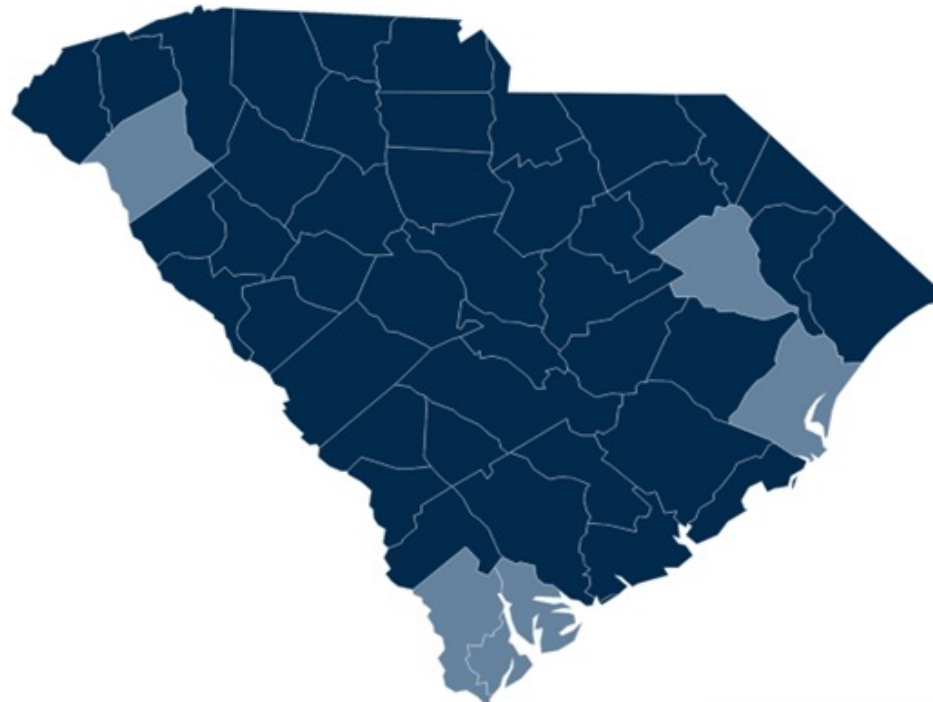


Rural Telehealth Workforce Development



SC Health Professional Shortage Areas

Health Professional Shortage Areas: Primary Care, by County, 2023 - South Carolina



Source: data.HRSA.gov, May 2023.

- HRSA designates:
 - 43 counties (93.5%) as completely or partially medically underserved
 - 44 counties (95.6%) as full or partial Primary Care Health Professional Shortage Areas (HPSAs)
 - SC ranks 44th nationally in terms of access to care

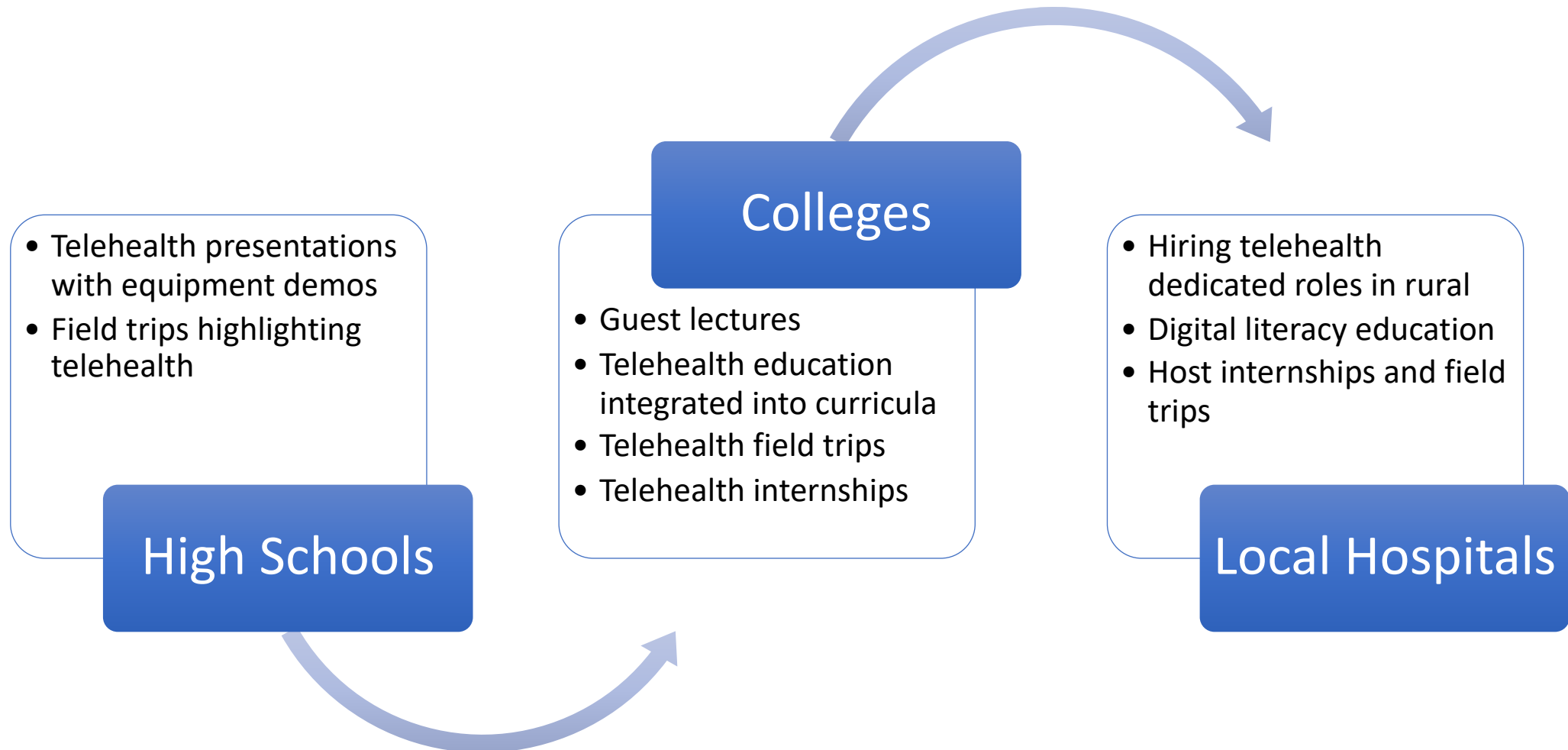


Increase in Telehealth & Workforce Need

- Telehealth utilization is significantly greater than pre-pandemic levels
- There is a need to develop telehealth student pipelines particularly in rural communities – cross training is critical in rural settings.
- Data from a study in NC indicate that the majority of nursing students graduating from Associate Degree programs remain in their local communities.
- Students matriculating through technical college programs may be more likely to remain in the local community following graduation if a pipeline is created to connect them to local health care facilities



Reach of Grant Activities





Case Study: Florence Darlington Technical College

- FDTC participates in network's Advisory Council
- Piloted education as guest lectureships
- Two modules permanently integrated into:
 - Certified Nursing Assistant (CNA)
 - MUSC/FDTC Patient Care Technician (PCT) Apprenticeship
- Module integrated into Computer Technology program starting Spring 2024
- Exploring other opportunities to partner to integrate telehealth education



FTDC CNA Module Integration

- MUSC developed two modules:
 - “Introduction to Telehealth”
 - “Telehealth and Nursing”
- Collaborated to develop train-the trainer materials
- MUSC offered an in-person training for all CNA instructors which included:
 - Modules with corresponding script
 - Small stipend for the instructors’ time to participate in the training
- Reached 85 students Spring 2023-January 2024
- Over 90% of students reached indicated that they are interested in using telehealth in their work



FALL CLASSES
at the
Continuum

**NEW Certified
Nursing Assistant (CNA)
class begins October 2**

Limited scholarship funding for tuition support

To register, or for additional information, please contact
Angela Lloyd at 843.413.2724 or angela.lloyd@fdtc.edu



FLORENCE TECHNICAL COLLEGE
TECH

Improving Systems of Care for Perinatal Behavioral Health

Guille C, King C, King K, Kruis R, Ford D, Maldonado L, Nietert PJ, Brady KT, Newman RB. **Text And Telephone Screening And Referral Improved Detection And Treatment Of Maternal Mental Health Conditions.** Health Aff (Millwood). 2024 Apr;43(4):548-556.





Maternal Deaths Due to Mental Health Conditions are Preventable

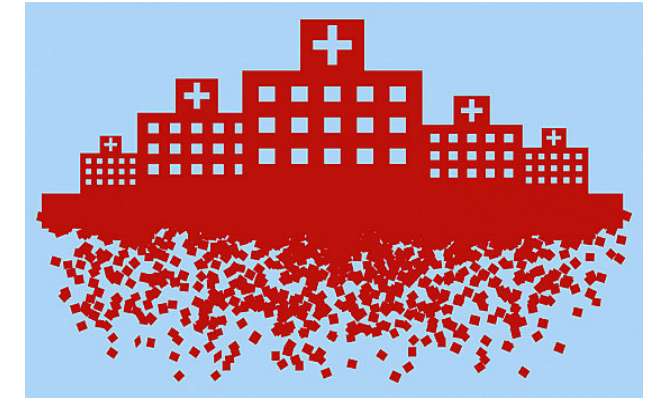
- Effective screening, identification, referral, appropriate treatment and communication and care coordination during pregnancy and postpartum year
- 1 in 5-8 screened for depression
 - Black individuals < likely to be screened than White individuals
- 1 in 4 attend treatment
 - Black individual < likely to attend treatment than to White individuals
 - Rural residence < likely to attend treatment than urban residence

MATERNAL HEALTH

By Susanna L. Trost, Jennifer L. Beauregard, Ashley N. Smoots, Jean Y. Ko, Sarah C. Haight, Tiffany A. Moore Simas, Nancy Byatt, Sabrina A. Madni, and David Goodman

Preventing Pregnancy-Related Mental Health Deaths: Insights From 14 US Maternal Mortality Review Committees, 2008-17

Barriers to Successful Screening & Effective Referral to Treatment



Patient	Provider	Healthcare System
Bias, Discrimination, Stigma, Racism	Bias, Discrimination, Racism	SDoH, Racism
Social Determinants of Health (SDoH)	Insufficient time	Cost: Time & Re/Training
Fear of social/legal consequences	Lack of MH/SUD knowledge	Separation of MH/SUD care
Lack of available or accessible *MH/SUD treatment providers	Lack of available or accessible *MH/SUD treatment providers	Lack of available or accessible *MH/SUD treatment providers

*MH: Mental Health; SUD: Substance Use Disorder

Listening to Women & Pregnant & Postpartum People



Text Message Based Screening



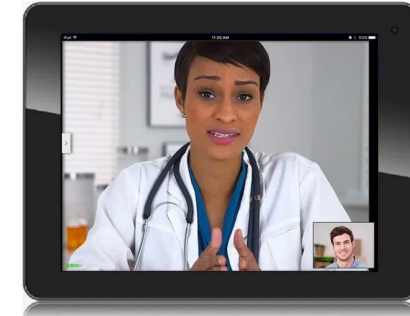
Brief Intervention

Remote Care Coordinator (MSW)



Referral to Treatment

Telemedicine/ Office or Home
Follow up



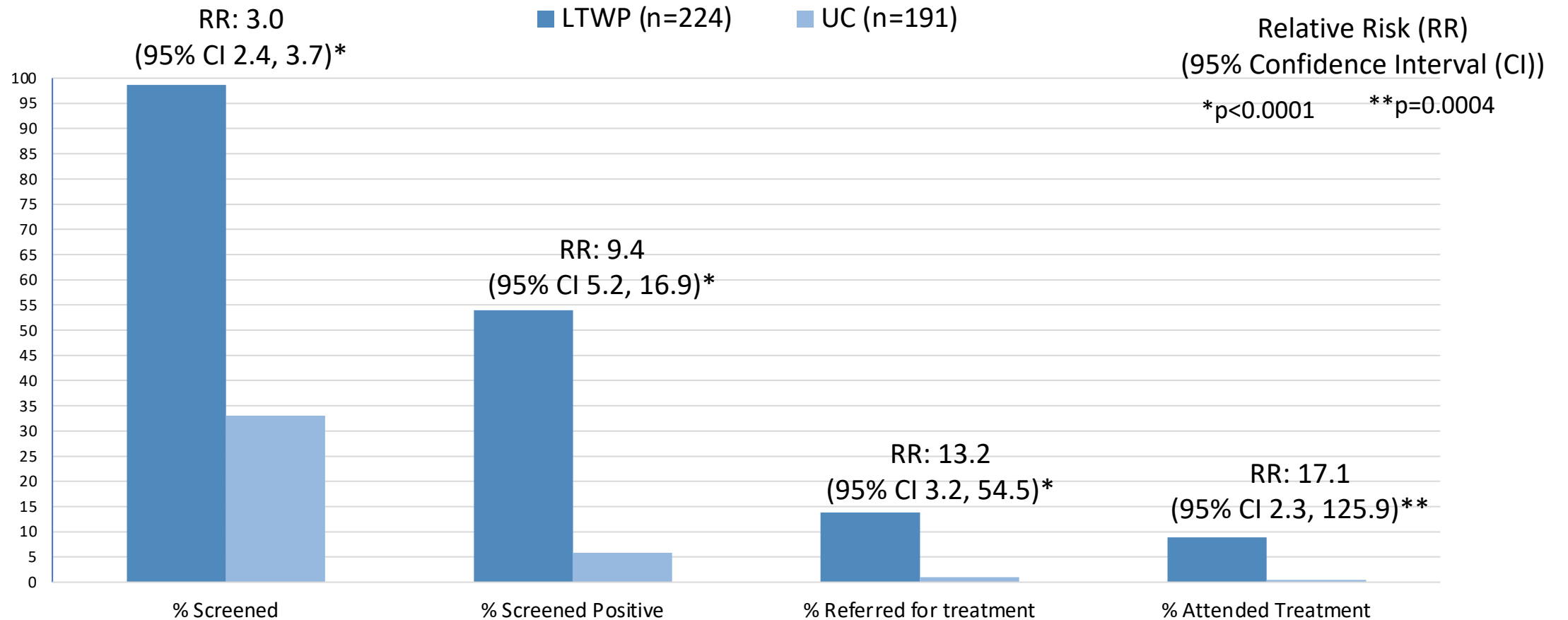
**Communicate with
Ob/Peds Team**

Screening information
Referral and Tx Progress



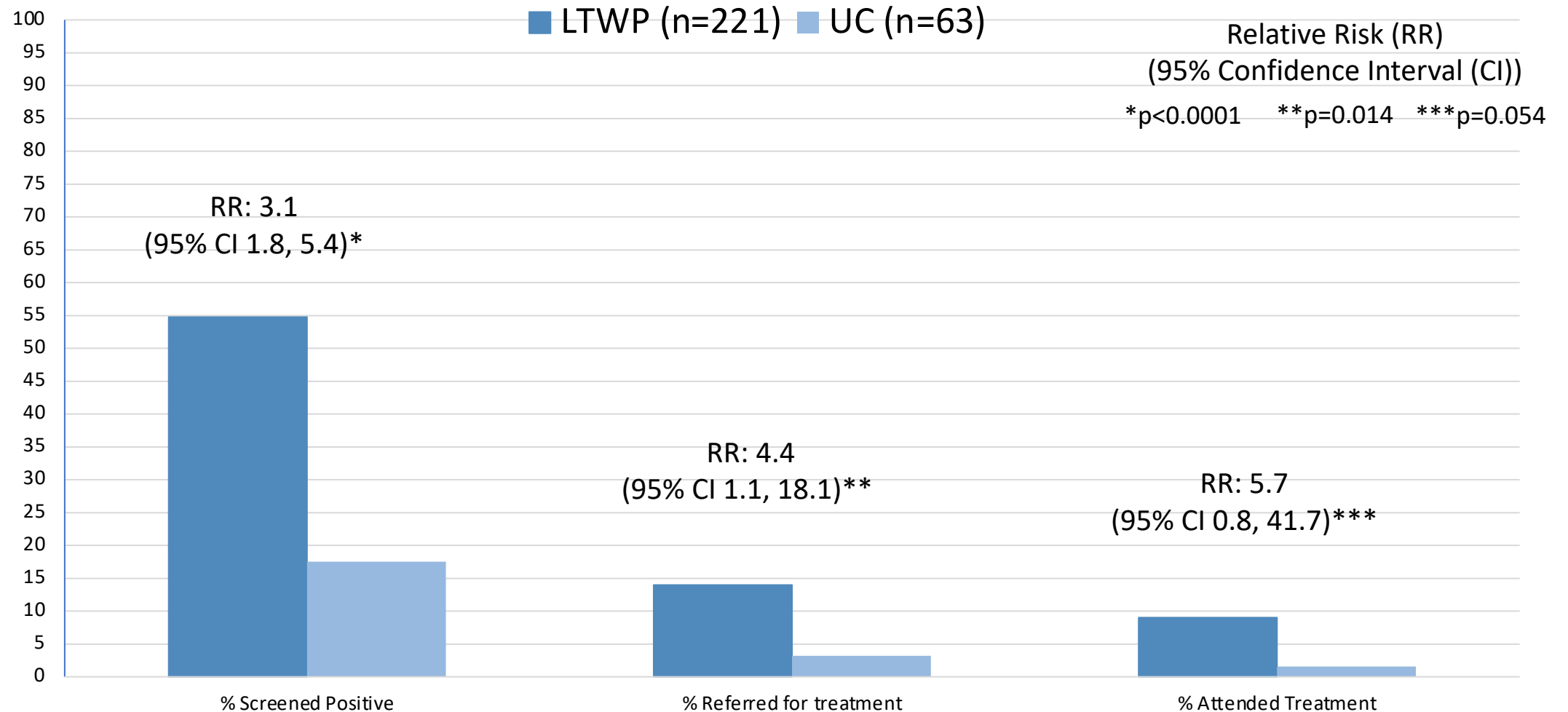


Primary Outcomes:
% of LTWP vs. UC Screened, Screened Positive,
Referred to Treatment & Attended Treatment



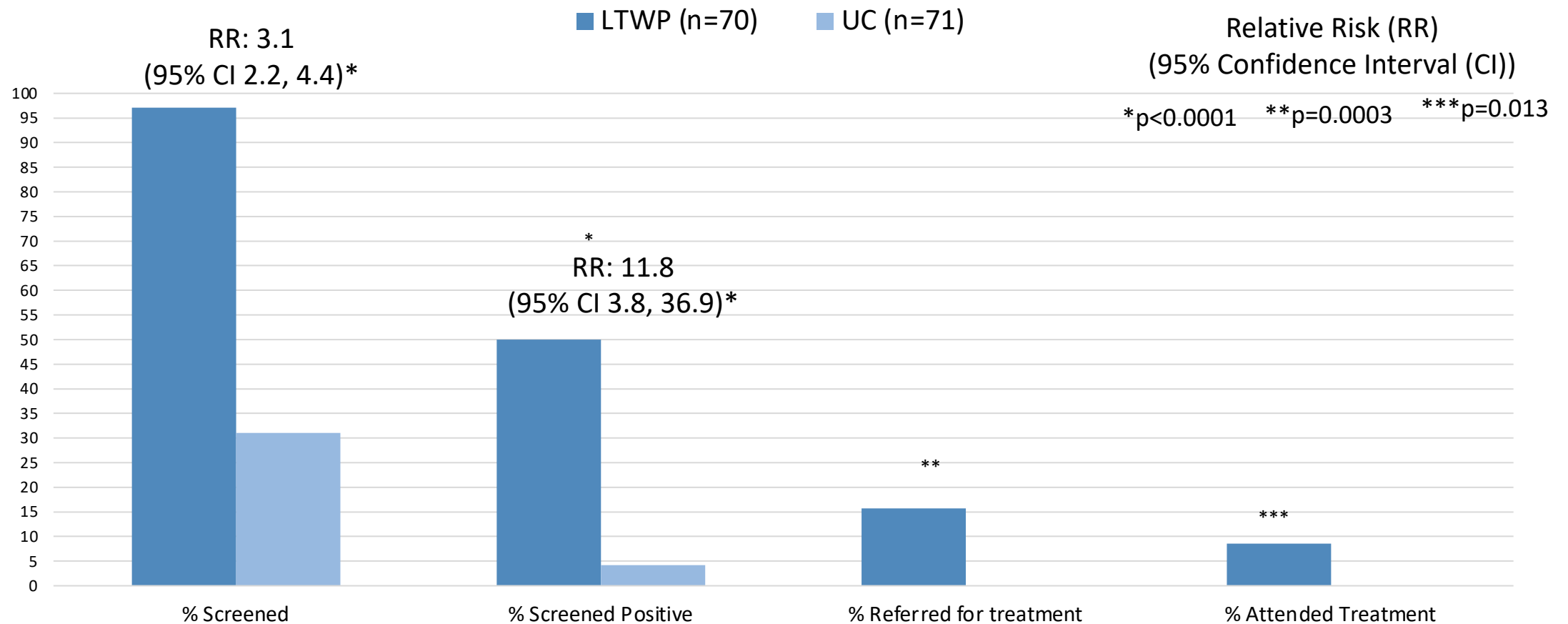


Secondary Outcomes [Participants Completing a Screen]:
% of LTWP vs. UC Participants Screened Positive,
Referred to Treatment & Attended Treatment



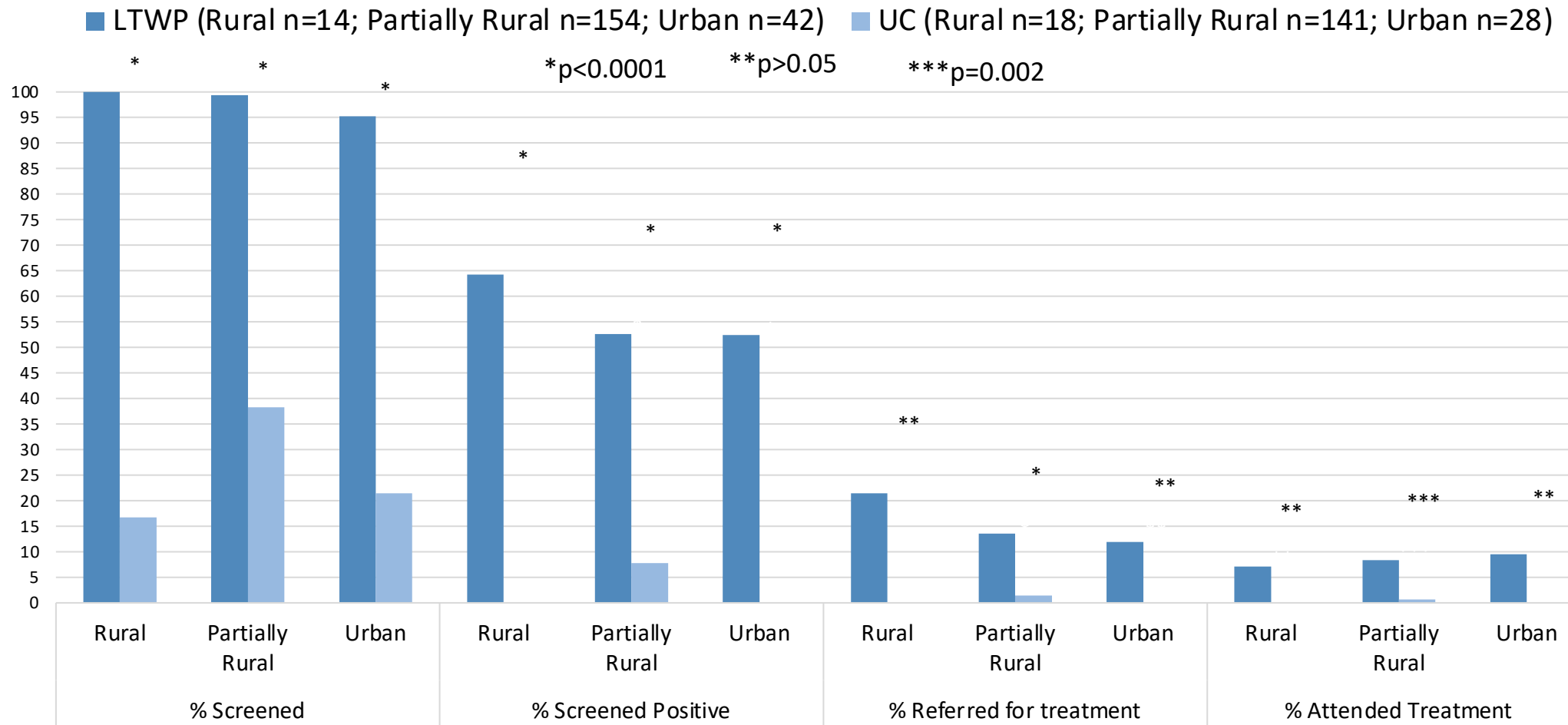


Subgroup Analyses [Black, Non-Hispanic]: % of LTWP vs. UC Participants Screened, Screened Positive, Referred to Treatment & Attended Treatment





Subgroup Analyses [by Rural, Partially Rural and Urban Residence]: % LTWP vs. UC Participants Screened, Screened Positive, Referred to Treatment & Attended Treatment





LTWP Summary Findings

- Compared to UC, LTWP participants were:
 - 3 times more likely to be screened
- Among those that are screened, compared to UC, LTWP participants were:
 - 3 times more likely to screen positive
 - 4.4 times more likely to be referred to treatment
 - 5.7 times more likely to attend treatment
- Findings consistent in Black, Non-Hispanic & Rural and Partially Rural Populations
- Call for healthcare system level changes, insurance payments, and policies to support adoption of text/phone screening and referral
- Continued efforts to support digital literacy, affordable internet service plans, access to broadband and devices with A/V capabilities



Webinar Series



Improving Systems of Care for Perinatal Mental Health and Substance Use Disorders

June 11, 2024
12:00 EST

[Register Here!](#)

Connie Guille, MD, MSCR
Professor
Department of Psychiatry and Behavioral Sciences
Medical University of South Carolina

Participants will learn about the application of text/phone and telehealth strategies to:

- Improve screening and identification of mental health and substance use disorders, intimate partner violence, and social determinants of health.
- Increase referrals and enhance attendance to maternal mental health and substance use disorder treatment.





Telehealth-enabled Psychiatric Collaborative Care (CoCM) in Rural Primary Care



Behavioral Health Crisis

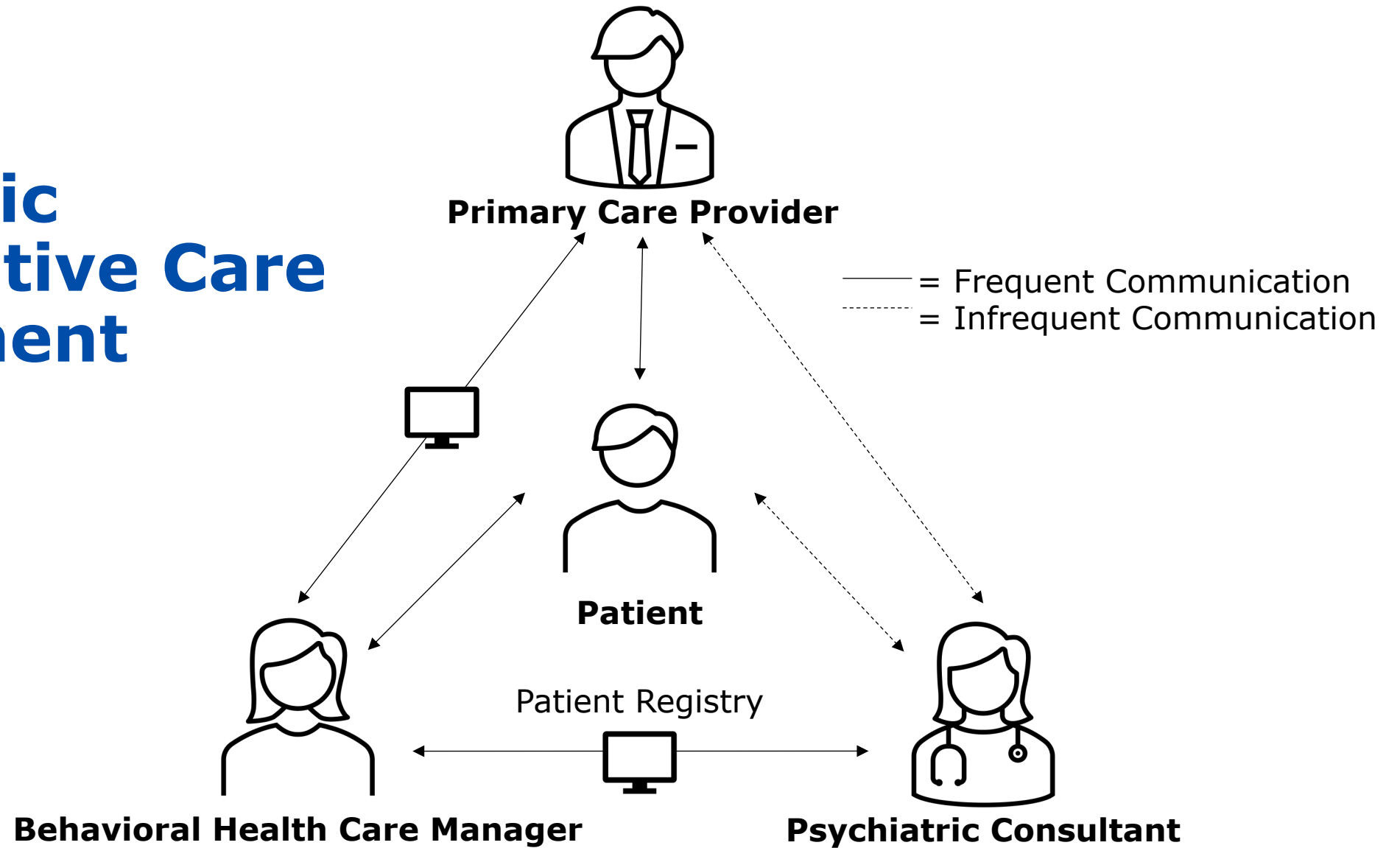
- Mental illness and substance use disorders are highly prevalent in the United States
 - 1 in 5 adults and 1 in 6 youth experience mental illness each year.¹
 - 13.9% of U.S. adults meet the criteria for alcohol use disorder and 3.9% for another drug use disorder.²
 - Acuity has only worsened since pandemic.³
- High costs of healthcare associated with not addressing behavioral health (BH)^{4,5}
- Rural BH especially concerning
 - Lower access to BH treatment despite similar rates.¹
 - Higher rates of suicide in rural communities.⁶
 - BH treatment often addressed in primary care.^{7,8}



Psychiatric Collaborative Care Management (CoCM)

- Model of “integrated care” or “BH integration” – treating BH in the context of primary care
- Strong-evidence base with over 90 clinical trials across a variety of primary care settings,⁹ and adoption has become a key policy priority^{10,11}
- Key components:⁹
 - Team-based Care: Primary care provider, BH care manager, psychiatric consultant
 - Population-focused: universal, preventative screenings and referrals to treatment; patient registries for efficient management
 - Measurement-based: Regularly administered, validated BH assessments to monitor progress toward to reach treatment goals.

Psychiatric Collaborative Care Management (CoCM)



Note. Adapted from University of Washington AIMS Center (2024)



CoCM in Rural Communities

- CoCM has great potential for rural BH:
 - Efficient use of limited BH resources
 - Ability to be conducted via telehealth
 - Embedded in primary care
- BUT, implementation has proved difficult:
 - Limited availability for BH workforce
 - Limited training and implementation resources for rural contexts
 - Financial constraints for startup

Implementation Science

- Implementation science deploys diverse study methods to support the uptake of evidence-based treatments into routine practice.¹²
- Implementation science has been applied broadly to in-person, practice-based CoCM
- Very few implementation science studies examining rural CoCM.^{13,14}
- Even fewer have focused on telehealth-enabled CoCM.¹⁵





MUSC Telehealth
Center of Excellence

171 Ashley Avenue,
Charleston, SC
(843) 792-1414

TelehealthCOE.org

Telehealth Centers
of Excellence

Implementation Science

Telehealth Toolkit

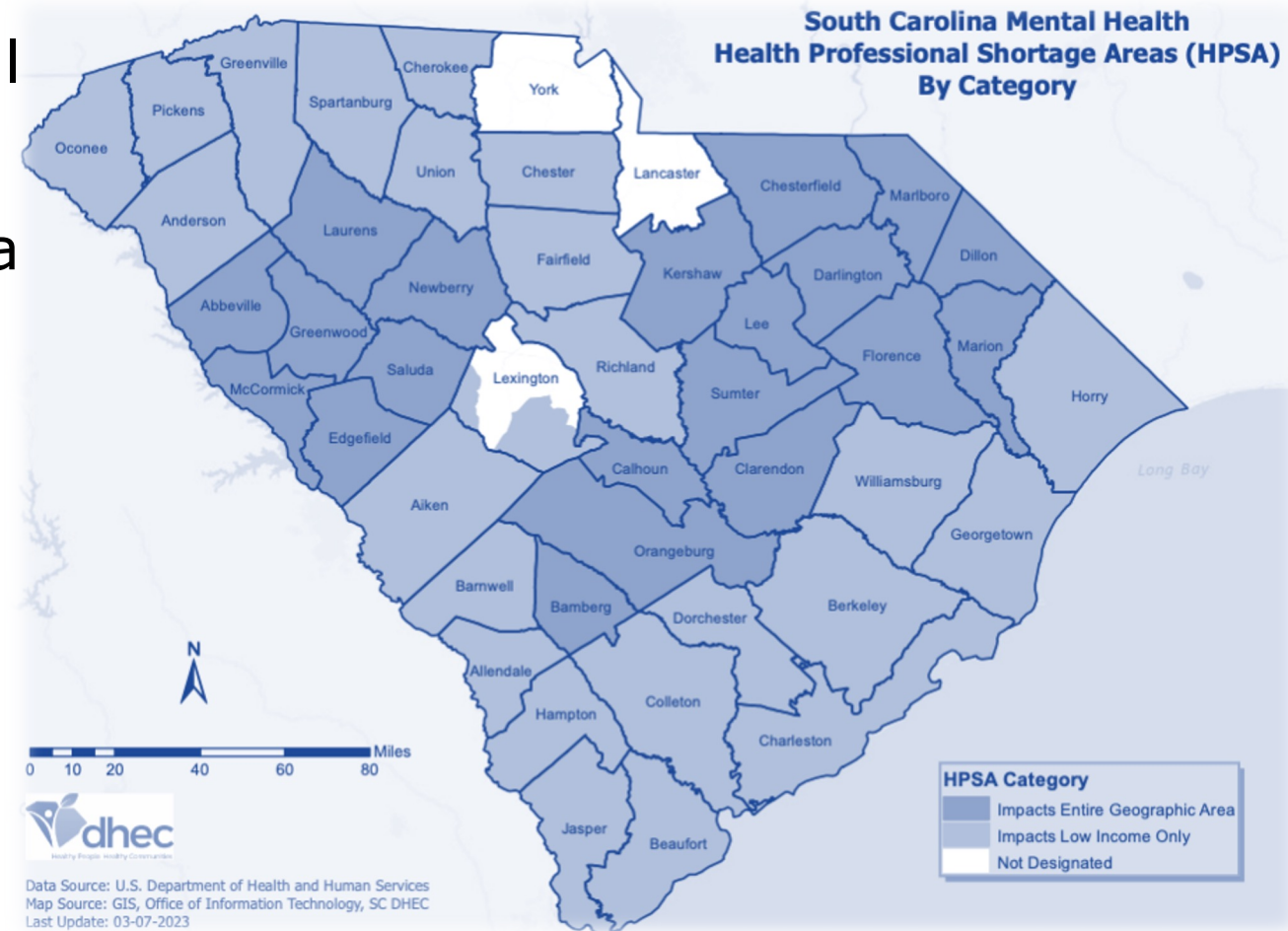


- Available on COE website:
 - <https://telehealthcoe.org/wp-content/uploads/2023/07/MUSC-COE-Implementation-Science-Telehealth-Toolkit.pdf>
- Johnson EE, Kruis R, Verdin R, Wells E, Ford DW, Sterba KR. **Development of an Implementation Science Telehealth Toolkit to Promote Research Capacity in Evaluation of Telehealth Programs.** *Telemed Rep.* 2023 Oct 4;4(1):286-291. doi: 10.1089/tmr.2023.0039. PMID: 37817872; PMCID: PMC10561742.



Pilot Background

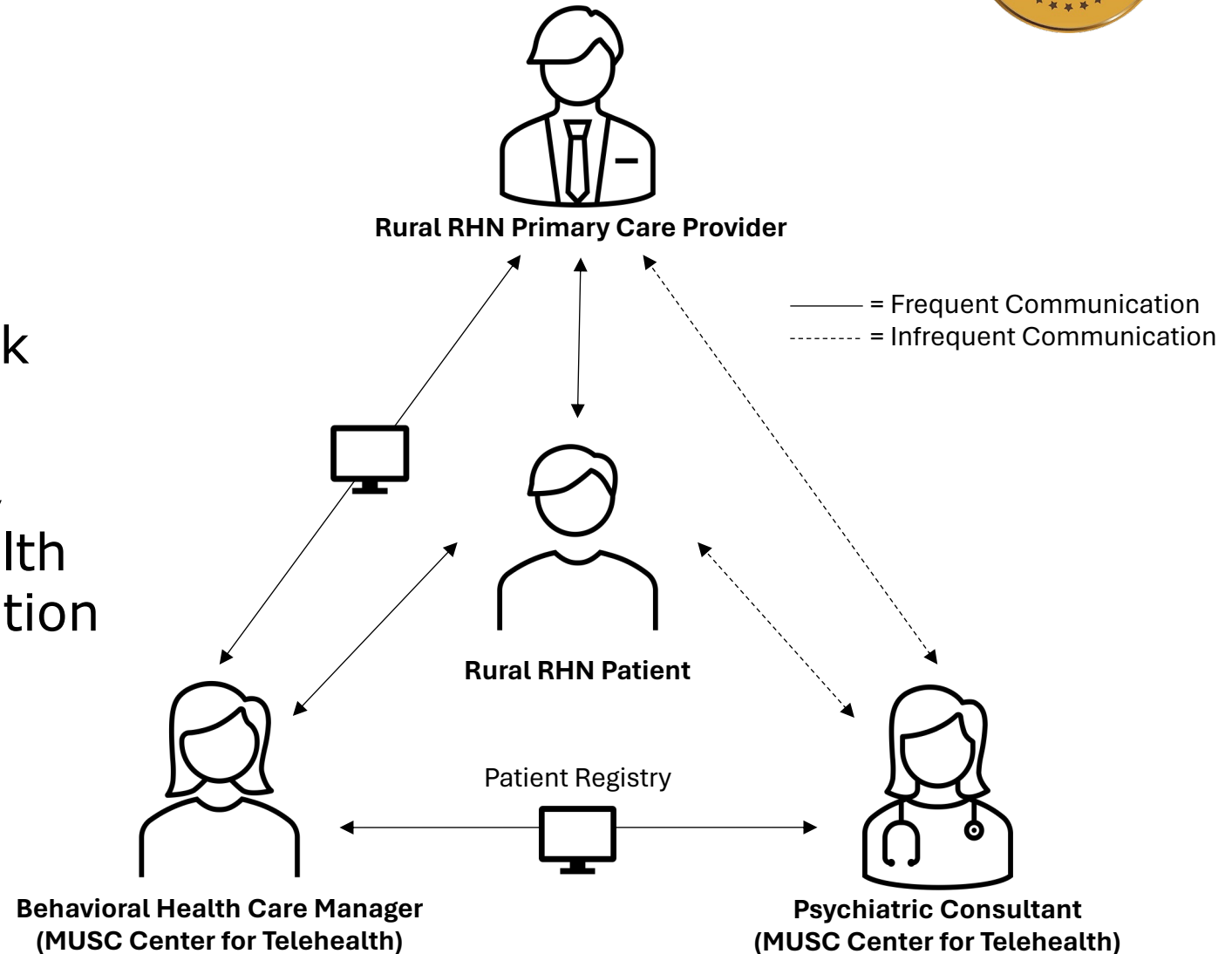
- 34% of South Carolinians are rural (compared to 19% nationally)²⁸
- 17 of 46 SC counties are without a practicing psychiatrist²⁹
- Regularly ranked in the top 10 worst states for mental health^{30,31}
- Most state is either fall or partial MH HPSA





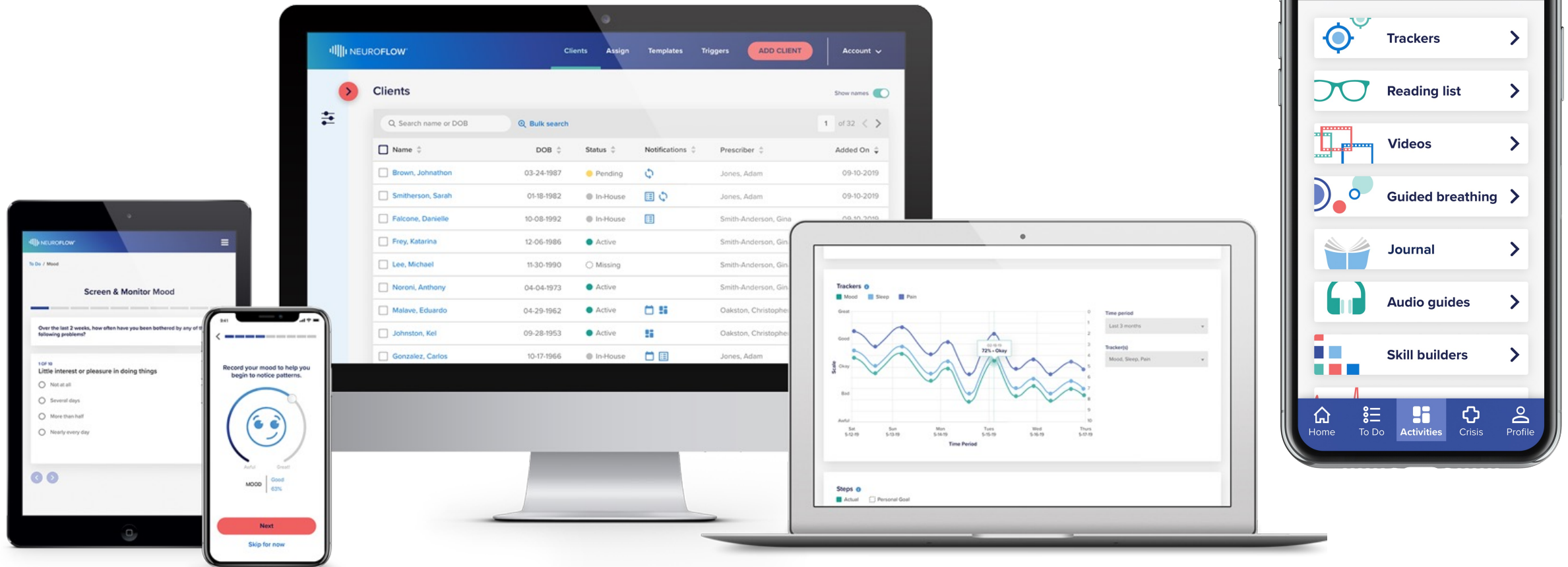
Pilot Background

- HRSA Telehealth Center of Excellence pilot
- 4 rural regional health network (RHN) primary care practices
- Funding to hire care manager, psych consultant, and telehealth platform, support implementation science evaluation
- Additional technology enhancements provided by telehealth partner





NeuroFlow® Partner





Methods: Aims & Design

Specific Aims:

- Determine ideal CoCM program model and implementation strategies to aid uptake
- Identify initial barriers and facilitators to implementation of telehealth-enabled CoCM among the four rural clinics
- Demonstrate the utility of the Dynamic Adaptation Process implementation science framework

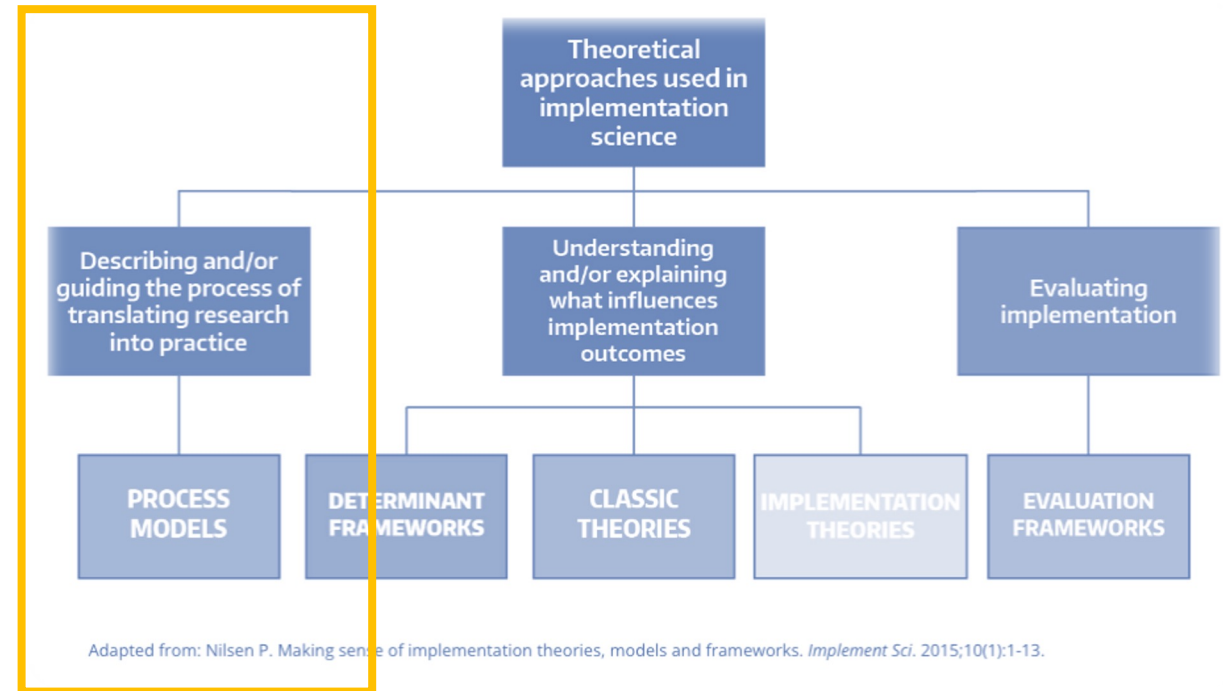
Design:

- Mixed-methods, embedded, chronology case study³²



Methods: Model

- Dynamic Adaptation Process (DAP) Model³³
 - Implementation science process model
 - Focused on adapting evidence-based practices into specific contexts
 - Making adaptations in a *planned* and *considered* manner
 - Based on the Exploration, Preparation, Implementation, and Sustainment (EPIS) framework³⁴
- Adapted the model to guide implementation process



EPIS Phase

Exploration Phase

Preparation Phase

Implementation Phase

Sustainment Phase

Factors & Outcomes

System level Assessment

- Payer coverage of CoCM
- Existing BH referral politics
- Primary care clinic policies
- Telehealth regulations

Organization level Assessment

- Leadership buy-in
- Staff dynamics
- EHR usage
- Current level of BH integration
- Demand for service

Provider Assessment

- Education, training, and experience treating BH
- Dispositional innovativeness
- Attitudes toward CoCM

Client Characteristics

- Demographics
- Rurality
- Culture
- Attitudes toward/experience w/ BH treatment
- Co-occurring problems
- BH acuity
- Digital literacy
- Insurance coverage

Implementation Resource Team

- Academic Researchers
- MUSC Center for Telehealth
 - Leadership Team
 - BH Manager
 - Psychiatrist(s)
- External CoCM Expert Consultant

CoCM Model

- Training and coaching in CoCM model for MUSC BH manager and psychiatrist
- Training rural site PCPs and practice managers in referral process
- Outline tip sheets for communication

Ad Hoc Adaptations

- Client-emergent issues
- EHR adaptations/integrations
- Resource referral options
- Provider skills and abilities
- Organizational workflow and billing adaptations

Outcomes

- Practice adoption of CoCM
 - # screens, referrals, connections to tx
 - Level of practice integration
- Patient satisfaction
- Provider satisfaction
- Program costs / staffing ratios
- Billable codes dropped
- Access to care (time to tx)
- Clinical outcomes (PHQ-9, GAD, AUDIT scores; resolution of symptoms)

Ongoing Feedback

Data Collection Tools

- Initial Site Survey
- Clinic Champion Surveys
- Clinic focus groups
- EHR data on clinic/client characteristics

- Implementation tracking log
- 1-month & 6-month post-implementation surveys
- MUSC team key informant interviews
- Ad hoc clinic feedback
- CoCM registry & clinical notes
- EHR data on other clinical data and utilization
- Budget data



Methods: Analysis

- Use chronological sequencing to develop a timeline of events pertinent to implementation
- Independent analysis of quantitative and qualitative methods
 - Descriptive statistics applied to surveys
 - Coded interviews and qualitative comments using codebook derived from EPIS³⁴:
 - Inner Context, Outer Context, Bridging, and Innovation factors
 - Additional codes regarding questions and implementation recommendations
- Integrated using a weaving approach, organized by the phases of DAP

Exploration Phase

- Implementation Activities
 - Built CoCM care team
 - Workflow and platform configuration
 - Conducted a multi-level assessment
- Multi-level Assessment
 - Site Survey
 - Champion Surveys
 - Clinic Focus Groups

System level Assessment

- Payer coverage of CoCM
- Existing BH referral politics
- Primary care clinic policies
- Telehealth regulations

Organization level Assessment

- Leadership buy-in
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- EHR usage
- Current level of BH integration
- Demand for service

Provider Assessment

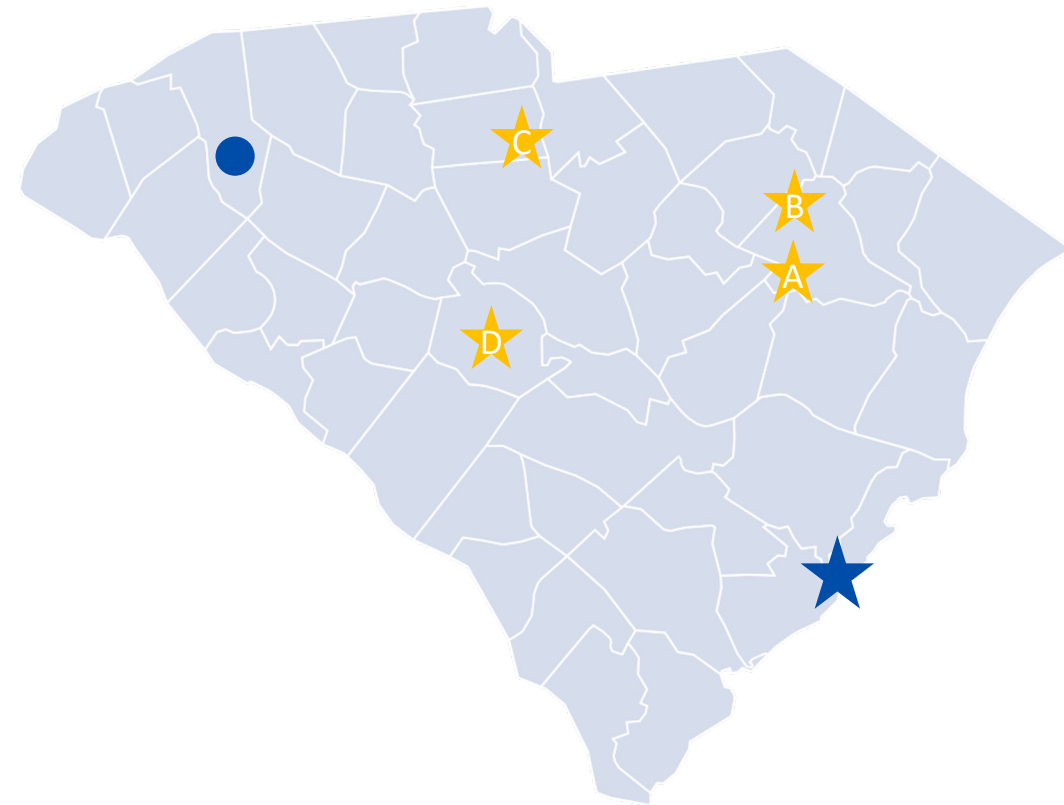
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- Co-occurring problems
- BH acuity
- Digital literacy
- Insurance coverage

- Initial Site Survey
- Clinic Champion Surveys
- Clinic focus groups
- EHR data on clinic/client characteristics

Table 1 Pilot Clinic Characteristics



	Clinic A	Clinic B	Clinic C	Clinic D
RHC designation	Yes	No	No	No
Staffing				
Primary care providers (PCP)				
Physician FTE	2	2	1	0
NP or PA FTE	2	1	1	1
Clinical support staff				
RN FTE	0	0	0	0
LPN FTE	3	1	2	0
CMA FTE	4	3	2	1
Behavioral health staff	0	0	0	0
Average number of patients scheduled / day / PCP	≥ 25	≥ 25	≥ 25	15-19
Annual staff turnover rate	< 10%	10 - 25%	< 10%	< 10%
Amount of time on current EHR	1-2 years	3+ years	3+ years	1-2 years
Universal depression screening rate	0-24%	missing	0-24%	50-74%
Patient Demographics				
Race				
American Indian/Alaska Native	0.4%	0.3%	0.4%	1%
Asian	0.4%	1%	0.3%	3%
Black/African American	35%	40%	20%	16%
Native Hawaiian/Pacific Islander	0%	0.1%	1.3%	0.2%
White/Caucasian	63%	56%	78%	78%
Other	1%	2%	1%	3%
Primary Insurance				
Commercial	29%	39%	31%	27%
Medicare	36%	32%	36%	42%
Medicaid	19%	9%	18%	6%
Managed Care	12%	14%	9%	13%
Other	5%	5%	7%	12%

PCP Champion Survey

- PCPs generally disagreed that they they were adequately meeting patients BH needs
- No issues identifying patient BH needs
- 7of 8 reported longer than 8 weeks for patients to see a psychiatrist
- Barriers outlined in Table 3.2

Barriers	Mean (SD)	Median (IQR)
Lack of BH Providers to Refer Patients to Adequate Financial Resources	4.0 (0.0)	4.0 (4.0-4.0)
Adequate Time	3.0 (0.5)	3.0 (3.0-3.0)
Designated Space for Behavioral Health Services	2.9 (0.8)	3.0 (2.0-3.3)
Patient Stigma around Mental Health	2.6 (1.2)	3.0 (1.8-3.3)
Patient Stigma around Substance Use	2.6 (0.7)	3.0 (2.8-3.0)
Designated Staff to Coordinate	2.6 (0.7)	3.0 (2.8-3.0)
Communication Between Disciplines	2.5 (1.1)	3.0 (1.8-3.0)
Other Issues Have Higher Priority	2.4 (0.7)	2.5 (2.0-3.0)
Adequate Staff Training	2.3 (0.7)	2.0 (2.0-3.0)
Health IT Systems	2.0 (0.8)	2.0 (1.8-2.3)
Obtaining Data Related to Quality Improvement Activities	1.8 (0.7)	2.0 (1.0-2.0)
Primary Care Provider Discomfort Discussing Mental Health	1.8 (0.7)	2.0 (1.0-2.0)
Primary Care Provider Discomfort Discussing Substance Use	1.6 (0.5)	2.0 (1.0-2.0)
Other Staff Commitment	1.6 (0.5)	2.0 (1.0-2.0)
Leadership within my Clinic	1.4 (0.5)	1.0 (1.0-2.0)
Primary Care Provider Commitment	1.4 (0.7)	1.0 (1.0-1.3)
Evidence about the Value of Such Activities	1.3 (0.5)	1.0 (1.0-1.3)

Table 2 Responses Ranking Barriers



Clinic Focus Group Themes

- Outer Context Factors
 - BH strain the PCPs are working under
 - Few referral resources
 - Reliance on local ED
 - Long wait times/distance for referrals
 - Insurance coverage challenges

People that come in and are actively manic and a danger to themselves and others, you literally have to go straight to the ER. We don't have any other resources here... Or it may be days to get them into a state bed somewhere. **Physician 1 (Clinic A)**

And heaven help you if you send them to the ER, they're going to get piled up in a room in the ER and sit there for days until a bed opens up or somebody from mental health comes through and says yeah, they're not suicidal anymore. All right. You can go home and go back to see your family doctor again and then it's kind of back here again. **Physician 2 (Clinic A)**



Clinic Focus Group Themes

- Outer Context Factors
 - BH strain the PCPs are working under
 - Few referral resources
 - Reliance on local ED
 - Long wait times/distance for referrals
 - Insurance coverage challenges
- Inner Context Factors
 - PCPs currently manage psychiatry

The timeframe for evaluation is approximately three to four months just to get into the mental health system. And our availability for counselors right now is terrible. We basically have no one. So probably 95% or greater of all of our psychiatric population now are treated in-house.

Nurse Practitioner 2 (Clinic C)



Clinic Focus Group Themes

- Outer Context Factors
 - BH strain the PCPs are working under
 - Few referral resources
 - Reliance on local ED
 - Long wait times/distance for referrals
 - Insurance coverage challenges
- Inner Context Factors
 - PCPs currently manage psychiatry
- Innovation Factors
 - Strong innovation fit due to high need

I think this sounds like a great idea and the fact that access will be opened up, that patients will have access to counseling & we will have access to more advanced providers that can help us with medication recommendations...I'm looking forward to it. I just wish it would happen sooner than June.

Physician 4 (Clinic B)

We have a lot of problems with anxiety and depression, and a lot of patients that are on medications – a lot of different medications that haven't worked, and we definitely need some help.

Physician 5 (Clinic C)



Clinic Focus Group Implementation Recommendations



Team Communication

Preference for asynchronous communication with BHCM regarding patients via EHR



Provider Training

Requested tip sheets with optional synchronous trainings to attend if needed



Patient Education

Requested flyers to assist with patient education when referring to the program



Preparation

- Implementation Activities
 - Finalized Workflow
 - BH Care Manager Site Visits
 - Care team training
- Planned for implementation based on feedback
 - Tip sheets
 - Workflow considerations

BHCM visited site, provided pastries and met providers, office staff, and office manager. This office is busy, interactions were brief but high energy. Providers requested printed referral criteria. I think this would be good, along with the tip sheets for EPIC referrals. BHCM did learn of three providers not on our initial provider list that work in this office. Will pass those names along to [IRT]. [Clinic A] is rural, more so than [Clinic B]. Staff is excited and feel the services are long overdue.

BHCM Site Visit Memo (Clinic A)

Implementation Resource Team

- Academic Researchers
- MUSC Center for Telehealth
 - Leadership Team
 - BH Manager
 - Psychiatrist(s)
- External CoCM Expert Consultant

- Implementation training
- 1-month & 6-month
- MUSC team key info
- Ad hoc clinic feedback
- CoCM registry & clinic
- EHR data on other clinics
- Budget data

Implementation Phase

Implementation

- Implementation Activities
 - Go live in June 2023
 - Post-implementation surveys (6 weeks, 7 months)
- Post-implementation surveys
- CoCM Care Team interviews

	6-Week Survey (n=5)	7-Month Survey (n=5)
Facilitators to Referral		
Patient Need	4	4
Engagement with BHCM	3	3
Patient interest	3	4
Support Staff	1	2
Provider Tip Sheet	1	0
In-Clinic MH Screenings	1	0
Training	0	1
Patient Handouts	0	0
Other	0	0
Barriers to Referral		
Patient interest	1	2
Other: Patient Tech Access	1	-
Other: EHR Referral Process	-	1
Lack of knowledge re: pilot	0	0
Remembering the pilot	0	0
Ability to describe the pilot	0	0
Adequate time	0	0
Lack of confidence in the pilot	0	0

Table 3 Post-Implementation Referral Facilitators



CoCM Care Team Interview Themes

- Bridging Factors
 - AIMS Center training resources used regularly
- Inner Context Factors
 - PI support on training and orientation to model
 - Commitment to adaptability
 - Prior work with integrated care models
 - Strong communication
 - BHCM site visits for building rapport
 - Telehealth platform
- Innovation Factors
 - Strong endorsement / EBF FIT

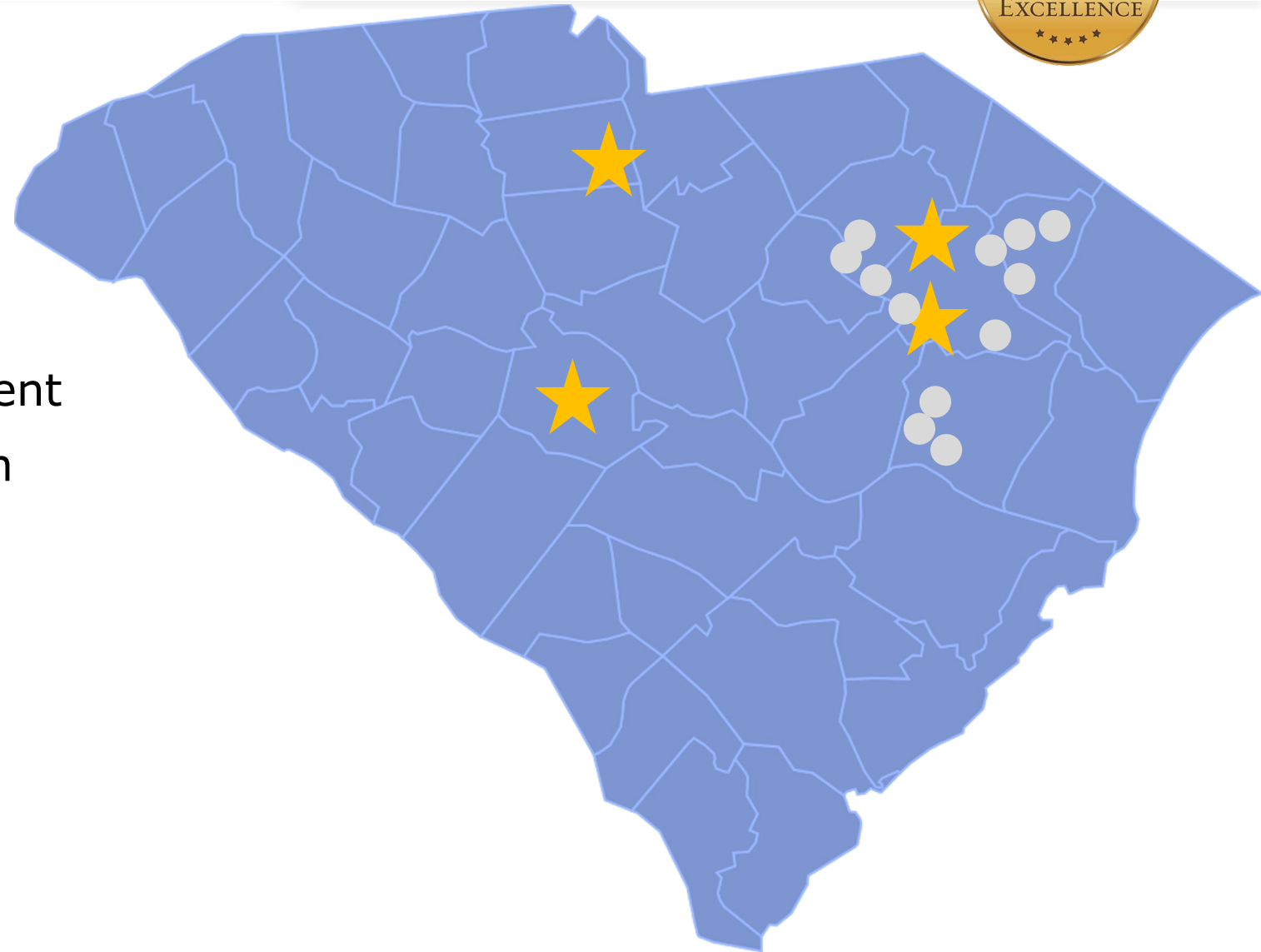
This is – it’s amazing model...I’ve always done integrated care. I’ve never specifically done collaborative care management, but it is – like, I have drank the Kool-Aid. I am all for it. We have been able to touch so many people, like, who need mental health services, who would otherwise have gone without them doing this. Yeah, I’m a big proponent of this. This is – it’s amazing.

BH Care Manager

Sustainment

- Implementation Activities

- Process Improvement
- Planning for growth



Outcomes

- Practice adoption of Co
- # screens, referrals, connections to tx
- Level of practice integration
- Patient satisfaction
- Provider satisfaction
- Program costs / staffing
- Billable codes dropped
- Access to care (time to
- Clinical outcomes (PHQ, GAD, AUDIT scores; respo of symptoms)



Process Outcomes

- 99 patients enrolled
- 296 referred
- 60+ medication recommendations to PCPs

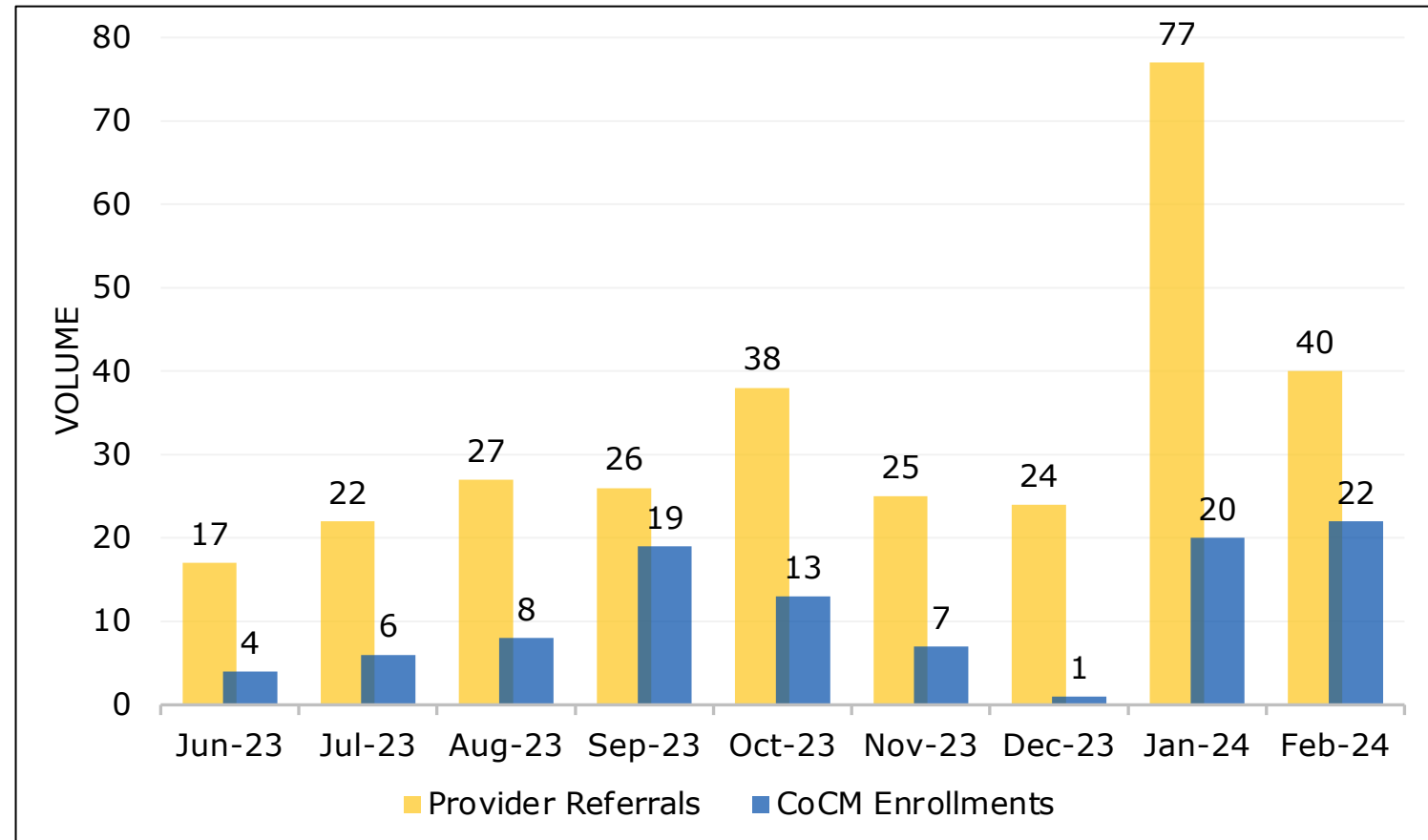
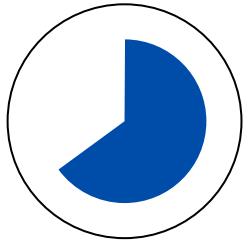


Figure 1 Referrals and enrollment by month



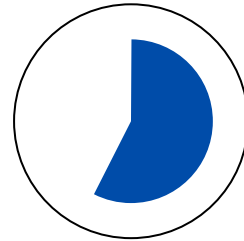
Outcomes



68%

Improved PHQ-9

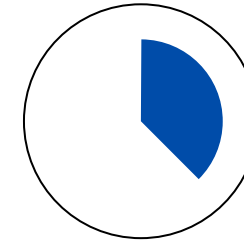
68% of patients reported a reduction in depression symptoms at 8 weeks



58%

Improved GAD-7

58% a reduction in anxiety symptoms at 8 weeks



38%

Engaged in Platform

38% utilized the self-guided psychoeducation tools of the platform)



Discussion

- Utility of the DAP model
- Importance of remote CoCM care team in enabling program
- Scarcity of BH referral sources enabler to program
- Value of a community-academic partnership
- Importance of ongoing engagement / relationship building
- Limitations
 - Generalizability
 - Single health system
 - Small sample size
 - No billing or caseload constraints
- Future directions
 - Non-affiliated clinics (HRSA BHI Grant)
 - Expansion across MUSC
 - Referral to treatment gap
 - Technology engagement

Discussion / Q&A



References

1. National Alliance on Mental Illness. Mental Health By the Numbers. Accessed 2/25/2023, <https://www.nami.org/mhstats>
2. Grant BF, Saha TD, Ruan WJ, et al. Epidemiology of DSM-5 Drug Use Disorder: Results From the National Epidemiologic Survey on Alcohol and Related Conditions–III. *JAMA Psychiatry*. 2016;73(1):39-47. doi:10.1001/jamapsychiatry.2015.2132
3. Panchal N, Saunders H, Rudowitz R, Cox C. *The Implications of COVID-19 for Mental Health and Substance Use*. 2023. March 20, 2023. Accessed August 31, 2023. <https://www.kff.org/mental-health/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/>
4. Davenport S, Gray TJ, Melek S. *How do individuals with behavioral health conditions contribute to physical and total healthcare spending?* 2020. Milliman Research Report. 04/29/23. <https://www.milliman.com/-/media/milliman/pdfs/articles/milliman-high-cost-patient-study-2020.ashx>
5. Niles L, Olin S. *Behavioral Health Quality Framework: A Roadmap for Using Measurement to Promote Joint Accountability and Whole-Person Care: A White Paper*. 2021.
6. Hedegaard H, Curtin, S. C., Warner, M. *Suicide Mortality in the United States, 1999–2017*. Data Brief. 2018. *NCHS Data Brief*. November 2018. Accessed 10/1/22. <https://www.cdc.gov/nchs/data/databriefs/db330-h.pdf>
7. Wang PS, Demler O, Olfson M, Pincus HA, Wells KB, Kessler RC. Changing profiles of service sectors used for mental health care in the United States. *Am J Psychiatry*. Jul 2006;163(7):1187-98. doi:10.1176/appi.ajp.163.7.1187
8. Powers DM, Bowen DJ, Arao RF, et al. Rural clinics implementing collaborative care for low-income patients can achieve comparable or better depression outcomes. *Fam Syst Health*. Sep 2020;38(3):242-254. doi:10.1037/fsh0000522
9. University of Washington AIMS Center. AIMS Center: Advancing Integrated Mental Health Solutions. Accessed 10/1/2022, <https://aims.uw.edu/>
10. Eighteen Organizations Express Support for the Collaborate in an Orderly and Cohesive Manner (COCM) Act Which Would Bolster Innovative Model of Provision of Mental Health Care. September 9, 2021, 2021. Accessed 10/1/2022. <https://psychiatry.org/news-room/news-releases/eighteen-organizations-express-support-for-the-col>



References

11. Bipartisan Policy Center. *Tackling America's Mental Health and Addiction Crisis Through Primary Care Integration: Task Force Recommendations*. 2021. March 2021. Accessed August 31, 2023.
12. Curran GM, Bauer M, Mittman B, Pyne JM, Stetler C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. Mar 2012;50(3):217-26. doi:10.1097/MLR.0b013e3182408812
13. Williams D, Eckstrom J, Avery M, Unützer J. Perspectives of Behavioral Health Clinicians in a Rural Integrated Primary Care/Mental Health Program. *J Rural Health*. Fall 2015;31(4):346-53. doi:10.1111/jrh.12114
14. Myers K, Stoep AV, Thompson K, Zhou C, Unützer J. Collaborative care for the treatment of Hispanic children diagnosed with attention-deficit hyperactivity disorder. *General Hospital Psychiatry*. 2010/11/01/
15. Fortney JC, Pyne JM, Ward-Jones S, et al. Implementation of evidence-based practices for complex mood disorders in primary care safety net clinics. *Fam Syst Health*. Sep 2018;36(3):267-280. doi:10.1037/fsh0000357
16. Centers for Medicare and Medicaid Services: Medicare Learning Network. *Behavioral Health Integration Services* (MLN909432 May 2023). 2023. MLN909432. May 2023. Accessed August 31, 2023. <https://www.cms.gov/files/document/mln909432-behavioral-health-integration-services.pdf>
17. Brown JD, Urato C, Ogbuefi P. Uptake of Medicare Behavioral Health Integration Billing Codes in 2017 and 2018. *Journal of General Internal Medicine*. 2021/02/01 2021;36(2):564-566. doi:10.1007/s11606-020-06232-z
18. Copeland JN, Jones K, Maslow GR, et al. Use of North Carolina Medicaid Collaborative Care Billing Codes After Statewide Approval for Reimbursement. *Psychiatr Serv*. Dec 1 2022;73(12):1420-1423. doi:10.1176/appi.ps.202200027
19. Marcotte LM, Reddy A, Zhou L, et al. Provision of Collaborative Care Model and General Behavioral Health Integration Services in Medicare. *Psychiatr Serv*. Jul 1 2021;72(7):822-825. doi:10.1176/appi.ps.202000265
20. Chung, H., Patel, U., Stein, D., Collado, K., & Blackmore, M. (2023). Medicaid Costs and Utilization of Collaborative Versus Colocation Care for Patients With Depression. *Psychiatr Serv*, 74(11), 1132-1136. <https://doi.org/10.1176/appi.ps.20220604>
21. Wolk, C. B., Wilkinson, E., Livesey, C., Oslin, D. W., Connolly, K. R., Smith-McLallen, A., & Press, M. J. (2023). Impact of the collaborative care model on medical spending. *Am J Manag Care*, 29(10), 499-502. <https://doi.org/10.37765/ajmc.2023.89438>



References

22. Overbeck G, Davidsen AS, Kousgaard MB. Enablers and barriers to implementing collaborative care for anxiety and depression: a systematic qualitative review. *Implement Sci*. Dec 28 2016;11(1):165. doi:10.1186/s13012-016-0519-y
23. Wood E, Ohlsen S, Ricketts T. What are the barriers and facilitators to implementing Collaborative Care for depression? A systematic review. *J Affect Disord*. May 2017;214:26-43. doi:10.1016/j.jad.2017.02.028
24. Girard A, Ellefsen E, Roberge P, Carrier JD, Hudon C. Challenges of adopting the role of care manager when implementing the collaborative care model for people with common mental illnesses: A scoping review. *Int J Ment Health Nurs*. Apr 2019;28(2):369-389. doi:10.1111/inm.12584
25. Stern C, Lizarondo L, Carrier J, et al. Methodological guidance for the conduct of mixed methods systematic reviews. *JBIEvidence Synthesis*. 2020;18(10)
26. Page MJ, Moher D, Bossuyt PM, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *Bmj*. Mar 29 2021;372:n160. doi:10.1136/bmj.n160
27. Hong QN, Gonzalez-Reyes A, Pluye P. Improving the usefulness of a tool for appraising the quality of qualitative, quantitative and mixed methods studies, the Mixed Methods Appraisal Tool (MMAT). *J Eval Clin Pract*. Jun 2018;24(3):459-467. doi:10.1111/jep.12884
28. U.S. Census Bureau. (2010). DEC Summary File 1: P2 | Urban and Rural. <https://data.census.gov/>
29. Greenberg, K., Katie Gaul. (2021). South Carolina Health Professions Databook.
30. Mental Health America. (2022). Access to Care Data 2022. Retrieved 10/1/2022 from <https://mhanational.org/issues/2022/mental-health-america-access-care-data>
31. Masterson, L. (2024, March 4). The worst states for Mental Health Care, ranked. *Forbes*. <https://www.forbes.com/advisor/health-insurance/worst-states-for-mental-health-care/>
32. Yin, R. (2003). *Case Study Research: Design and Methods* (3rd ed.). Sage Publications, Inc.
33. Aarons GA, Green AE, Palinkas LA, et al. Dynamic adaptation process to implement an evidence-based child maltreatment intervention. *Implement Sci*. Apr 18 2012;7:32. doi:10.1186/1748-5908-7-32
34. Moullin JC, Dickson KS, Stadnick NA, Rabin B, Aarons GA. Systematic review of the Exploration, Preparation, Implementation, Sustainment (EPIS) framework. *Implementation Science*. 2019/01/05 2019;14(1):1. doi:10.1186/s13012-018-0842-6
35. Leshner AP, Fakhry SM, DuBose-Morris R, Harvey J, Langston LB, Wheeler DM, Brack JT, McElligott JT. Development and Evolution of a Statewide Outpatient Consultation Service: Leveraging Telemedicine to Improve Access to Specialty Care. *Popul Health Manag*. 2020 Feb;23(1):20-28. doi: 10.1089/pop.2018.0212. Epub 2019 Jun 4. PMID: 31161963