North Carolina Department of Health and Human Services

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Adam Sholar
Legislative Counsel
Director of Government Affairs

November 1, 2014

SENT VIA ELECTRONIC MAIL

The Honorable Justin Burr, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 307A, Legislative Office Building
Raleigh, NC 27603-5925

The Honorable Mark Hollo, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 639, Legislative Office Building
Raleigh, NC 27603-5925

The Honorable Ralph Hise, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 1028, Legislative Office Building
Raleigh, NC 27603-5925

Dear Representatives Burr and Hollo and Senator Hise:

In accordance with Section 12A.2B.(b) of Session Law 2013-360 entitled Establish Statewide Telepsychiatry Program, we are submitting the enclosed report that summarizes the progress of the program, number of participating providers and hospitals, length of stay of patients, and number of involuntary commitments recommended.

We appreciate the opportunity to submit this report on the Statewide Telepsychiatry Program. Should you have any questions, please contact Chris Collins at (919) 527-6440.

Sincerely,

Adam Sholar

cc: Sarah Riser
Susan Jacobs
Joyce Jones
Pat Porter
Theresa Matula
Pam Kilpatrick

Rod Davis
Dr. Robin Cummings
Brandon Greife

Chris Collins
Steve Owen
reports@ncleg.net

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November 1, 2014

SENT VIA ELECTRONIC MAIL

Mr. Mark Trogdon, Director
Fiscal Research Division
North Carolina General Assembly
Room 619, Legislative Office Building
Raleigh, NC 27603-5925

Dear Director Trogdon:

In accordance with Section 12A.2B.(b) of Session Law 2013-360 entitled Establish Statewide Telepsychiatry Program, we are submitting the enclosed report that summarizes the progress of the program, number of participating providers and hospitals, length of stay of patients, and number of involuntary commitments recommended.

We appreciate the opportunity to submit this report on the Statewide Telepsychiatry Program. Should you have any questions, please contact Chris Collins at (919) 527-6440.

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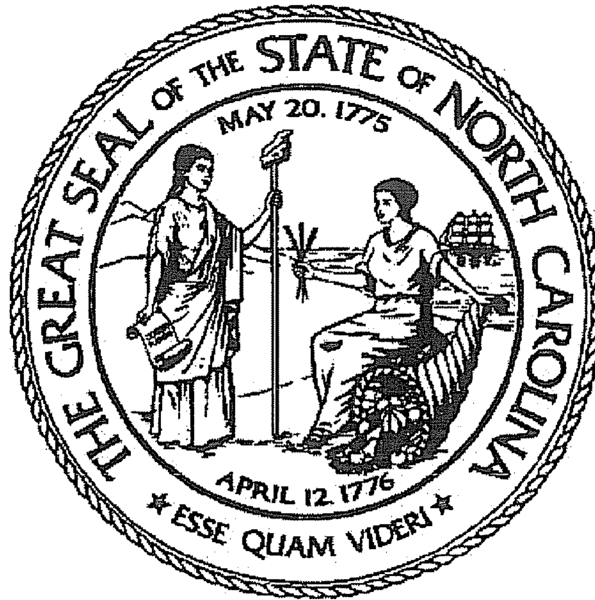

Summary Report on SFY 2014 North Carolina Statewide Telepsychiatry Program (NC-STeP) Funds

Section 12A.2B of North Carolina Session Law 2013-360

N.C. Department of Health and Human Services

November 2014

Acknowledgements

The North Carolina Department of Health and Human Services would like to thank Governor McCrory and the North Carolina General Assembly for their vision and support for the program.

Additionally, the North Carolina Department of Health and Human Services would like to thank The Duke Endowment for its generous award and support, which have enabled the Department to expand and further develop the program.

The program has had positive outcomes for the State of North Carolina and it has created an opportunity to integrate the Office of Rural Health and Community Care, the NC Division of Medical Assistance, the NC Department of Mental Health, Developmental Disabilities, and Substance Abuse Services, State-operated facilities, and external partners to improve the care continuum for mental health patients in North Carolina.

Executive Summary

In Session Law 2013-360, the Office of Rural Health and Community Care (ORHCC) was directed to create a plan for a statewide telepsychiatry program. The North Carolina Statewide Telepsychiatry Program (NC-STeP) allows North Carolina hospitals to participate as referring sites (hospital emergency departments) or consulting sites (psychiatric practices) in providing psychiatric assessments to patients experiencing an acute mental health or substance abuse crisis. Through a contractual agreement with the East Carolina University Center for Telepsychiatry and e-Behavioral Health (C-TeB) to implement these services into hospitals, ORHCC is responsible for overseeing the creation and operations of NC-STeP while monitoring the program's expenditures, hospital enrollment, and performance measures.

As of June 30, 2014, 22 referring sites have implemented telepsychiatry, with 64 additional sites scheduled to go-live by June 30, 2015. Additionally, there are five consulting sites enrolled in the program that are providing psychiatric assessments. These consulting sites include Coastal Carolina Neuropsychiatric Center (CCNC), Cone Health, Mission Health, Monarch, and Novant Health.

As required by contract with ORHCC, C-TeB submitted quarterly reports regarding specific performance measurements. As of this report, most legislative performance targets have been met or exceeded. [1]

In accordance with the law, ORHCC conducted site visits to all referring sites in which telepsychiatry has been implemented, as well as to all consulting sites. The results of these site visits are reported high staff satisfaction, but there are still issues that require future attention, including physician credentialing policies, cumbersome equipment, and internet connectivity.

While state funding was essential to the creation of the statewide program, leaders of NC-STeP pursued additional funding from The Duke Endowment to expand and further develop the program through an additional contract with ORHCC. Funds in the amount of $1.5 million were awarded to ORHCC in SFY 2014 and will be disbursed in SFY 2015 and 2016. Through use of this award, NC-STeP will expand to provide services to an estimated 18 additional referring sites. Funding will also be leveraged to disseminate information regarding best practices of telepsychiatry through technical assistance, informational website, provider training modules, publications, and conferences.

As laid out in the legislative plan, NC-STeP has achieved ED enrollment targets during its first year. However, only $595,743 of the state-appropriated funding for SFY 2014 was spent. In response, a carryover request was submitted and approved so that the remaining $1,404,257 can be utilized during SFY 2015. ORHCC has extended its contract with C-TeB to reflect these changes.

The program has resulted in cost savings to the State, its partners, and external stakeholders. Out of 374 overturned involuntary commitments during SFY 2014, 204 involved Self Pay and Medicaid patients. The estimated cost savings to the State from these overturned involuntary commitments is $1,102,356.[2]

[1] Some results were not reported in SFY 2014. Please see section on performance measures for details.

[2] This estimate was provided by NC-STeP.

Additionally, other government and private entities have experienced cost savings, including Medicare, hospitals, commercial insurance companies, and local sheriff's departments.

Overall, NC-STeP has had a successful first year, but there is still much to be completed. The creation of the Telepsychiatry Web Portal, which was budgeted for Year 1, has been delayed until Year 2. Additionally, the first portion ($725,000) of The Duke Endowment award will be disbursed on September 1, 2014, which will enable more referring sites to enroll in the program. Of this total, ORHCC will retain a small portion to ensure appropriate oversight of the program.

DHHS recommends that ORHCC expand its telehealth program to include integrated outpatient services for behavioral health. The program that is established should allow all disciplines to work at the top of their licenses so as not to further exacerbate workforce shortages and unnecessarily increase cost. The scope of work for LCSWs, LPCs, and psychologists should be modified to include risk screenings, mental health, tobacco cessation, substance abuse services, and behavioral changes necessary to improve medical conditions. This will allow a population health approach that is whole person focused.

In SFY 2016 and 2017, ORHCC recommends that the State appropriate funds for expanding the telehealth program to include outpatient services for behavioral health. ORHCC also recommends that the State continue funding NC-STeP until sustainability is achieved. ORHCC will require funds for administrative costs such as: staffing, contracting, monitoring, and travel as telehealth systems are developed to meet the needs of rural and underserved populations. These resources are currently provided through The Duke Endowment funding, which will cease in SFY 2016.

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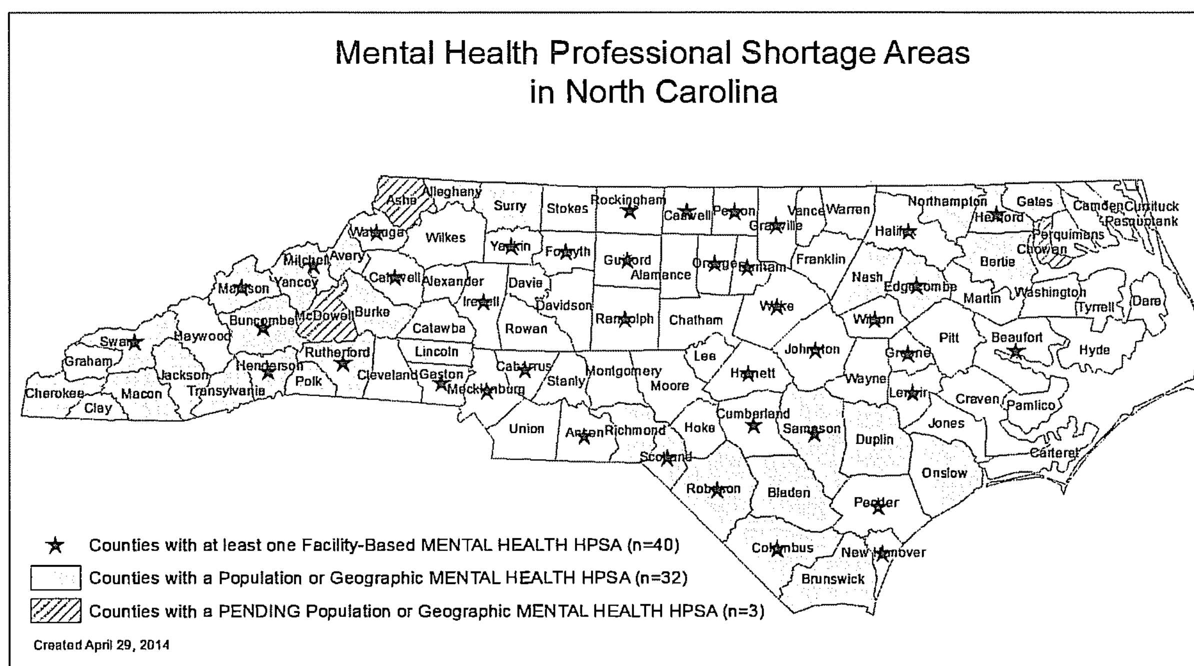
Background

Many rural North Carolina communities have a shortage of mental health providers. Areas can become designated Health Professional Shortage Areas (HPSAs) due to very low ratios between the number of providers and an area's population. Figure 1 is a map displaying the areas that are currently designated HPSAs specifically for mental health professionals in North Carolina. Currently 40 of 100 counties have at least one facility-based HPSA for mental health. The state application process to the federal government for designating HPSAs is changing, which could result in even more areas being identified as lacking mental health providers in the future.

Figure 1: Map of Mental Health Professional Shortage Areas



These mental health professional shortages are acutely felt in emergency department (ED) settings. When a person in the community presents the potential to harm themselves or others, a magistrate may order that the person be taken to an ED for an assessment by a trained individual. However, many ED physicians have not received the training necessary to comfortably conduct such an assessment; thus, many of these patients are transferred to mental health institutions. Under this model of care, the average length of stay (LOS) in an ED for this kind of patient can be between 48 and 72 hours.[3] A very long LOS can also have other negative consequences, including increased wait times, diversion of ED staff resources, and increased use of law enforcement resources.

In an attempt to resolve this issue, many EDs in the United States have begun to utilize telepsychiatry, which is a technology that enables a mental health professional to provide a consultation to a patient from

[3] The DMH Telepsychiatry Program. (2013, July 31). *South Carolina Department of Mental Health.* Retrieved August 11, 2014, from http://www.state.sc.us/dmh/telepsychiatry/

a remote location. In recent years, emerging technologies in video communication and high-speed connectivity have created an environment that has enabled telepsychiatry networks to expand.

In the summer of 2013, the North Carolina General Assembly decided to replicate the success of previous telepsychiatry initiatives in the state and elsewhere. In Session Law 2013-360, Section 12A.2B, the North Carolina General Assembly tasked the Office of Rural Health and Community Care (ORHCC) with creating a plan for a statewide telepsychiatry program. The North Carolina Statewide Telepsychiatry Program (NC-STeP) would allow North Carolina hospitals to participate as referring sites or consulting sites in providing psychiatric assessments to patients experiencing an acute mental health or substance abuse crisis. Through a contractual agreement with the East Carolina University Center for Telepsychiatry and e-Behavioral Health (C-TeB) to implement these services into hospitals, ORHCC oversees the operations of NC-STeP while monitoring the program's expenditures, hospital enrollment, and performance measures.

The plan for NC-STeP was modeled after the Albemarle Hospital Foundation Telepsychiatry Project, which was made possible with a grant from The Duke Endowment in 2010. The grant was awarded for the implementation of telepsychiatry services into the ED of Vidant Health hospitals, which experienced a decreased average LOS, a greater than 80% patient satisfaction rating, and a 33.6% rate in overturned involuntary commitments.[4]

Other successful telepsychiatry programs include the South Carolina Department of Mental Health Telepsychiatry Program[5] and the University of Virginia Telepsychiatry Program[6], which both continue to provide telepsychiatry services throughout their respective states. In this way, telepsychiatry has proven to be a successful solution for states with rural populations lacking behavioral health resources.

Program Implementation

The program began October 2013. As of June 30, 2014, 22 referring sites have implemented telepsychiatry, with 64 additional sites scheduled to go-live by June 30, 2015. Ten of the 22 referring sites were part of the original Albemarle Hospital Foundation Telepsychiatry Program, but continue to report data to NC-STeP and receive some support from state funds. A complete list of enrolled hospitals and projected go-live dates can be found in Appendix A of this document. Figure 2 displays a map of site locations and information regarding go-live dates. Figure 3 shows the progress of full go-live implementations between September 1, 2013 and June 30, 2014.

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[4] Davies, S. (2012, August 23). Vidant Health / Duke Endowment Telepsychiatry Project. *North Carolina Institute of Medicine*. Retrieved August 11, 2014, from http://www.nciom.org/wp-content/uploads/2012/06/Bed-Boarding-Davies.pdf

[5] The DMH Telepsychiatry Program. (2013, July 31). *South Carolina Department of Mental Health*. Retrieved August 11, 2014, from http://www.state.sc.us/dmh/telepsychiatry/

[6] Telepsychiatry. (n.d.). *School of Medicine at the University of Virginia*. Retrieved August 11, 2014, from http://www.medicine.virginia.edu/clinical/departments/psychiatry/sections/clinical/telepsychiatry/telepsychiatry

Figure 2: NC-STeP Go-Live Schedule Map

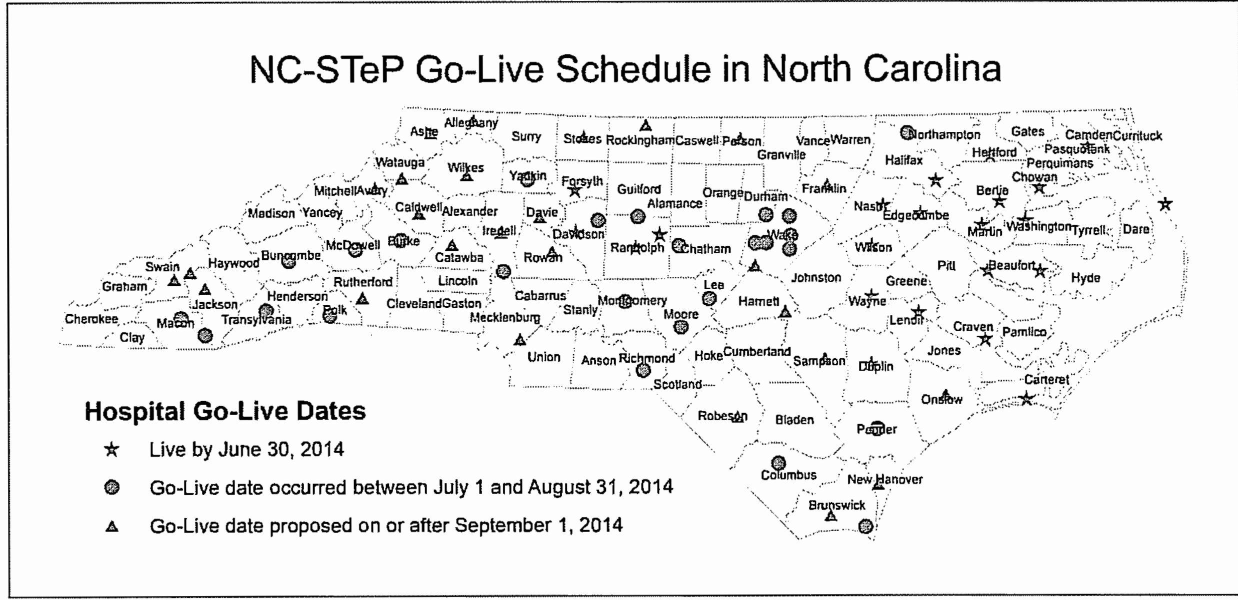
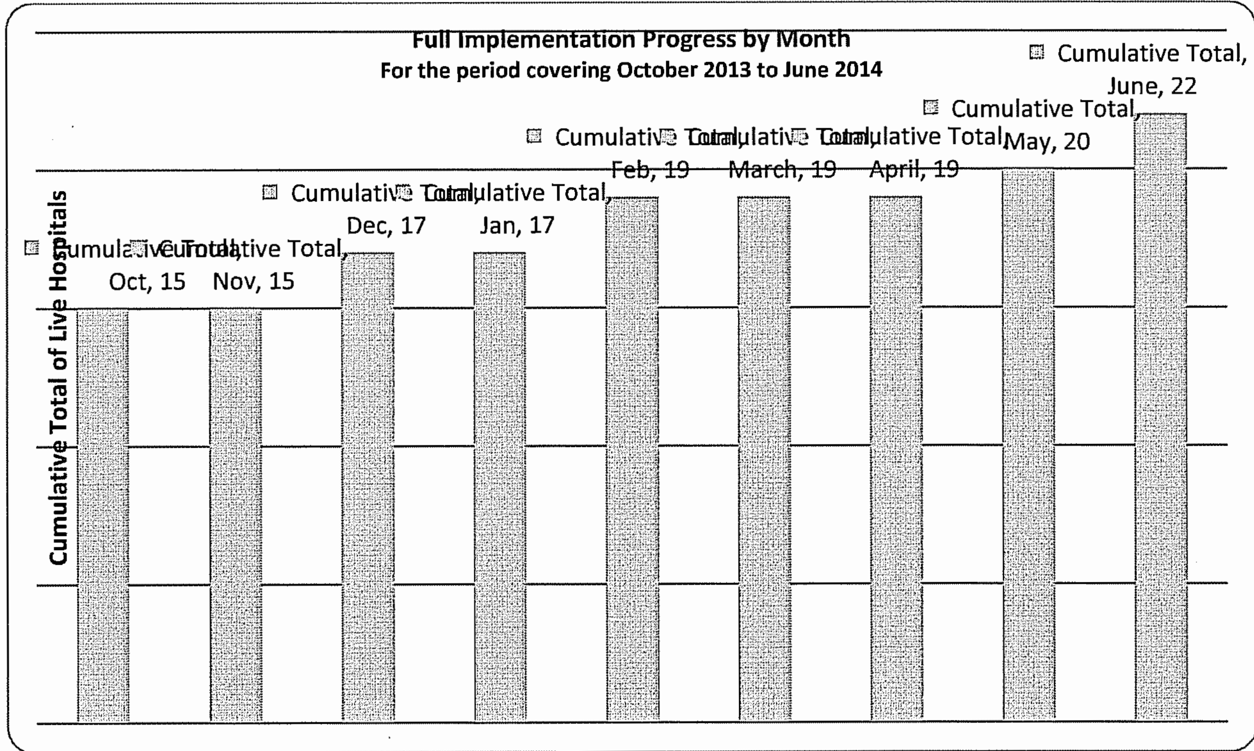


Figure 3: Project Implementation Progress by Month



Additionally, there are five consulting sites enrolled in the program. These consulting sites include Coastal Carolina Neuropsychiatric Center (CCNC), Cone Health, Mission Health, Monarch, and Novant Health.

While state funding was essential to the creation of the statewide initiative, leaders of NC-STeP in partnership with ORHCC pursued additional funding from The Duke Endowment to expand and further develop the program. These funds were awarded to ORHCC in SFY 2014 and will be disbursed in SFY 2015 and 2016. Through this award, NC-STeP will expand to provide services to an estimated 18 additional referring sites. Funding will also be leveraged to disseminate information regarding best practices of telepsychiatry through technical assistance, informational website, provider training modules, publications, and professional conferences.

Performance Measures

As required by contract with ORHCC, C-TeB submitted quarterly reports regarding specific performance measurements. These performance measurements were specified in Session Law 2013-360, Section 12A.2B and are displayed in Table 1 with their respective targets and outcomes. The North Carolina Department of Health and Human Services (DHHS) also incorporated additional measures pertaining to patient satisfaction and sustainability. The program has met or exceeded most performance targets specified at the beginning of the contract for SFY 2014.

In some cases, performance targets were not met or were not reported. One of these performance targets pertains to LOS times. Average LOS times are between 25 and 30 hours, but this is often due to outlier patients with complex medical and behavioral needs. Also contributing to LOS are the involuntary commitment patients who are required to wait in the ED for an available bed at a state psychiatric facility. Another performance measure issue is the internal and external satisfaction results, which were not reported in Year 1 but will be reported by C-TeB in Year 2. Pilot testing of a satisfaction survey to ED and psychiatric provider staff is underway, however. Preliminary results indicate satisfaction results greater than 85% for both ED staff and psychiatric providers.

Table 1: NC-STeP Performance Measurements

(Outcomes marked with an asterisk (*) have met the corresponding DHHS target)

Evaluation Criteria	Baseline at 10/01/2013	DHHS Target by 06/30/2014	Actual Result by 06/30/2014
To increase the number of participating consulting providers	12	20	21*
To increase the number of overturned involuntary commitments	300	336	374*

Evaluation Criteria	Baseline at 10/01/2013	DHHS Target by 06/30/2014	Actual Result by 06/30/2014
To increase the number of telepsychiatry referring sites	14	30	30* (22 out of the 30 were actually reporting data)
To provide evaluation and care to involuntary commitment patients	556	834	1,465*
To reduce the average length of stay for all patients with a primary mental health diagnosis	48 hours	18 hours	24.6 hours†
To maintain a minimum score of 85% "satisfied" or "strongly satisfied" satisfaction rate among internal and external customers	85%	85%	††
To increase the ratio of overall revenues to program costs	N/A	≥1:1	<1:1

† Median length of stay was reported instead of average due to outliers.
†† No data have been reported for this performance measure.

Site Visit Results

In accordance with the law, ORHCC conducted site visits to all required referring sites in which telepsychiatry has been implemented, as well as to required consulting sites. The results of these site visits include very high provider staff satisfaction as well as issues that require future attention. The primary issues discussed during these site visits are summarized below.

Provider Satisfaction with NC-STeP – ED providers interviewed during the hospital visits were universally satisfied with telepsychiatry and the support they had received from the program. Structured

questions revealed they felt they had received adequate training, were comfortable with the technology, and felt they could perform their jobs better through telepsychiatry.

Physician Credentialing - In some cases, this has delayed the implementation of the program. Each physician at a consulting site must be credentialed by the referring site in order to provide services at that site. The physician credentialing process takes between 3-6 months for each facility, which delays program implementation.

Length of Stay – There are many factors which affect LOS, some of which are beyond the ED's control. Despite use of telepsychiatry, a patient's LOS can vary and still remain above average depending upon discharge disposition. Patients with complex medical needs, in addition to behavioral needs, can expect to remain in the ED longer. A patient placed under involuntary commitment may have the order overturned and can be sent home. However, patients whose involuntary commitment orders are upheld must await placement in an appropriate facility. This process often takes up to 48-hours and can be even longer if a patient is an adolescent.

Availability of Service - Several sites informed ORHCC that they wished these services were provided 24 hours a day, 7 days a week. Currently, telepsychiatry services are only offered during business hours. There are insufficient resources to provide 24/7 support, thus patients who arrive in the ED during the evening will be required to spend the night, thereby increasing average LOS.

Telepsychiatry Carts - The telepsychiatry carts are designed to be mobile, but some earlier models were reported to be difficult for staff members to move, especially over long distances. The rapid evolution of the hardware was evident during the site visits, as some hospitals possessed the earlier, more cumbersome equipment, while other hospitals were using the lighter, more easily-maneuvered carts. Some sites requested that tablet computers be adopted in the future so that telepsychiatry may be even more easily brought to the patient's location.

Connectivity - Several sites are currently using the telepsychiatry cart's wireless capability to connect to the internet. However, due to the thickness of building materials used in hospital construction and the lack of high-powered wireless technology in some areas, staff members are discovering difficulty in connecting to the local wireless network. Other sites connect the telepsychiatry cart to the internet via a cable and wall jack, but this is only possible if wall jacks are available in the patient's room.

Financial Report

The North Carolina General Assembly appropriated a sum of $2,000,000 for each of SFY 2014 and 2015. The use of these funds included: 1) entering into a contract with C-TeB, and 2) purchasing the necessary equipment for hospitals participating in the program. In addition to the state funds, The Duke Endowment also awarded a sum of $1,400,000 to NC-STeP. The first portion ($725,000) of this award will be disbursed and budgeted for SFY 2015.

Budget Carryover

Due to delays in initializing NC-STeP during its first year, only $595,743 of SFY 2014 funding was spent. Several components of the program are delayed until SFY 2015, including creation of the

Telepsychiatry Web Portal/Health Information Exchange, development of additional provider hubs, contingency for indigent care, and invoices for telepsychiatry equipment.

In response to this issue, a carryover request was submitted and approved so the remaining $1,404,257 can be utilized during SFY 2015. ORHCC extended its contract with C-TeB to reflect these changes. Table 2 summarizes the budget detail for SFY 2014 (Year 1) and SFY 2015 (Year 2).

Table 2: NC-STeP SFY 2014 and 2015 Budget Detail

Category	Narrative	Budgeted Year 1	Accrued Year 1	Budgeted Year 2
Capital Equipment	Telepsychiatry Equipment	$403,000	$0	$939,854
Operating Expenses	Provider Support, Billing, Travel, etc.	$700,122	$462,115	$1,367,736
Staffing	Employee Salaries/Wages	$133,628	$133,628	$357,999
Telepsychiatry Web Portal	NC-STeP Web Portal / Health Information Exchange	$763,250	$0	$1,463,668
Total		**$2,000,000**	**$595,743**	**$4,129,257**

Estimated Cost Savings

Overall, the program has resulted in cost savings to the State, its partners, and external stakeholders. Out of 374 overturned involuntary commitments during SFY 2014, 204 involved Self Pay and Medicaid patients. The estimated cost savings to the State from these overturned involuntary commitments is $1,102,356. Table 3 summarizes the estimated cost savings for several government and private entities.[7]

Table 3: Estimated Cost Savings to Entities

Entity	Estimated Cost Savings
State of North Carolina (from Medicaid and Self-Pay)	$1,178,960
Medicare Program	$364,338
Commercial Insurance	$302,681
Local Sheriff Departments	$535,404

[7] These estimates were provided by NC-STeP.

It is important to note that numerous additional entities have also experienced cost savings due to the program, but these cost savings are more difficult to quantify. For example, hospitals have experienced cost savings due to the decrease in average LOS.

Next Steps

Overall, NC-STeP has had a successful first year, but there is still much to be completed. Session Law 2013-360 and The Duke Endowment have created tasks for NC-STeP, and there are additional opportunities for expansion of telehealth initiatives in North Carolina.

Program Developments for SFY 2015

The creation of the Telepsychiatry Web Portal was budgeted for Year 1 of the program, but has been delayed until Year 2. C-TeB has selected a vendor and is currently negotiating a contract. The Telepsychiatry Web Portal will enable provider scheduling, billing, and will exchange health information, allowing hospitals to transmit clinical outcomes to C-TeB.

The first $800,000 of The Duke Endowment award will be disbursed on September 1, 2014. Of this total, $725,000 will be awarded to C-TeB. These funds will enable an additional 18 referring sites to join the program as well as provide for research on best practices. This body of research will likely be disseminated via publications, professional conferences, and a website maintained by C-TeB.

Program Developments for SFY 2016

The remaining $700,000 of The Duke Endowment award will be disbursed on September 15, 2015. Of this total, $625,000 will be awarded to C-TeB. These funds will be used to implement the Telepsychiatry Web Portal, following time spent in development and beta testing of the system. There will also be operational spending related to increasing videoconferencing capabilities, credentialing providers with State-approved LME/MCOs, and exchanging data. Finally, implementation of referring sites will continue, along with information dissemination via the aforementioned channels.

Program Developments for SFY 2017

In SFY 2017, NC-STeP is scheduled to be finished with implementation and will enter a maintenance phase. There will be ongoing maintenance for the Telepsychiatry Web Portal and for the existing telepsychiatry equipment. Physician credentialing will continue as staff turnover demands.

Long-Term Sustainability

NC DHHS requested that sustainability be an additional factor incorporated into the contract. C-TeB reports that approximately 42% of the individuals served have no insurance coverage. Currently, the program, without including grant support from the State and other sources, is at the end of SFY 14 operating at a 0.49:1 ratio (revenue: cost) while the desired objective is a 1:1 ratio. That is to say, for every dollar the program spends, it is able to recover 49 cents. These costs are recovered in three ways: 1) charging a fee for using the service, which is currently set at $34.25 for each telepsychiatry assessment

conducted, 2) charging an average $1,000 monthly subscription fee paid by hospitals, and 3) billing public and private payors for each assessment.

Although NC-STeP has saved the State of North Carolina, hospitals, third-party payers, and law enforcement agencies money resulting from overturning involuntary commitment orders and reducing patient readmissions to the ED, there is no formal arrangement with the State to offset program costs with those savings. DHHS is working with C-TeB to explore options that move toward long term sustainability, including but not limited to: increasing the hospital assessment fee, reviewing billing and coding procedures, decreasing startup costs, and exploring resources within DHHS.

Recommendations

DHHS recommends that ORHCC expand its telehealth program to include integrated outpatient services for behavioral health. Currently, there are many independent sites in North Carolina providing telepsychiatry services to partners within primary care. There remains need within the safety net system (Local Health Departments, Community Health Centers, Rural Health Centers, School Based Health Centers, Free Clinics, and other non-profits) for increased access to behavioral health services.

In designing an outpatient telebehavioral health program, the following system issues should be given serious consideration:

- There is a significant workforce shortage in North Carolina with regards to psychiatrists.
- The program that is established should allow all disciplines to work at the top of their licenses so as not to further exacerbate workforce shortages and unnecessarily increase cost. For example, a therapist can assist a primary care provider with teletherapy until such time a referral to a psychiatrist is warranted. A primary care practice that employs an integrated therapist may secure telepsychiatry consults for complex medication management.
- Policy should be modified so that, internally or through telebehavioral health, primary care providers can access the services of midlevel providers, such as LCSWs, LPCs, and psychologists, to work at the top of their licenses. Their scope of work in the primary care setting should include risk screenings, mental health, tobacco cessation, substance abuse services, and behavioral changes necessary to improve medical conditions. This will allow a population health approach that is whole person focused.
- In order to prevent duplication of services, duplication of funding, and in the interest of creating access to enhanced specialty mental health services when appropriate, this expanded effort must be closely linked with DMHDDSA and the regional LME/MCO.

Funding Recommendations for SFY 2016

In SFY 2016, ORHCC recommends that the State continue funds to support NC-STeP while C-TeB and DHHS work to achieve independent sustainability. ORHCC recommends that NC hospitals are charged a subscription and assessment fee and that NC-STeP eliminate costs associated with implementation. ORHCC has received funds from the Duke Endowment to cover legislatively mandated administrative costs that were not in the appropriation.

ORHCC also recommends that the State expand funding to develop a telehealth program for outpatient services for behavioral health. The new telebehavioral health program should be targeted at providing access to behavioral health services for primary care providers serving vulnerable populations and promote integrated care. These funds would allow for provider contracting, equipment purchases, and other necessary start-up costs of the program.

As mentioned previously, DHHS and C-TeB are working to achieve long-term sustainability with NC-STeP. As sustainability is achieved, any NC-STeP surplus funds should be used to expand outpatient telehealth services.

Funding Recommendations for SFY 2017

In SFY 2017, ORHCC recommends that the State continue funds to support NC-STeP. ORHCC also recommends that the State continue funds to further develop telehealth outpatient services for behavioral health. Additionally, ORHCC will require funds for administrative costs such as: staffing, contracting, monitoring, and travel as telehealth systems are developed to meet the needs of rural and underserved populations. These resources are currently provided through The Duke Endowment funding, but this funding will cease in SFY 2016.

Additional Opportunities for Telehealth

Annual site visits and external research have identified several opportunities for telehealth initiatives to expand into other areas of medicine. Per the legislative directive, please find below a short list of additional opportunities for expansion of telehealth services in North Carolina.

Telestroke - Several ED staff indicated that they would like to see the technology used for expert evaluation of potential stroke victims. Telestroke is a form of telehealth that has been adopted by facilities such as the Mayo Clinic and Mass General Hospital. Under this service, an ED physician engages in videoconference with a consulting provider to help determine the best course of action for a patient experiencing acute stroke. One of the most common treatments is the use of FDA-approved therapy to remove the blood clot causing the stroke; however, the decision to administer this therapy is time-sensitive, as patient outcomes are generally better the sooner the therapy is administered. According to a recent study, providing decision support via telehealth has been successful in reducing the time between the patient presenting this condition and the physician administering the therapy.[8] This option would build out on existing infrastructure within the ED setting and could potentially leverage the equipment that has already been purchased.

Teleophthalmology - In a recent publication, a group of ophthalmologists developed a smartphone adapter that was effective for taking photos to identify retinopathy in developing or rural areas.[9] These photos could be sent via a store-and-forward method to an ophthalmologist for assessment. Additionally,

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[8] Rubin, M., & Demaerschalk, B. (2014). The use of telemedicine in the management of acute stroke. *Journal of Neurosurgery*, *36*(1), E4.

[9] Maamari, R., Ausayakhun, S., Margolis, T., Fletcher, D., & Keenan, J. (2014). Novel Telemedicine Device for Diagnosis of Corneal Abrasions and Ulcers in Resource-Poor Settings. *JAMA Ophthalmol*, *132*(7), 894-895.

clinicians have found applications for teleophthalmology in prevention and patient education.[10] These services would create access to optical care that is a critical component in the treatment of diabetes, which is a major health concern in North Carolina.

Telehealth for Primary Care - In a 2003 program, the Veterans Health Administration began to offer a set of primary care telehealth services for management of chronic conditions. Patients accessed these services from home via videoconferencing, while also wearing devices that kept track of their vital signs. The program was successful in reducing costs in the form of hospital visits and was focused on encouraging self-management of chronic conditions.[11]

[10] Zvornicanin, E., Zvornicanin, J., & Hadziefendic, B. (2014). The Use of Smart phones in Ophthalmology. *ACTA Inform Med*, *22*(3), 206-209.

[11] How can telehealth technology benefit primary care?. (n.d.). Health Resources and Services Administration. Retrieved August 25, 2014, from http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/howcantelehealth.html

Appendix A: List of Enrolled Hospitals and Go-Live Status

As of June 30, 2014. Sorted by county and hospital.

Hospital	County	Provider	Status	Projected Go-Live Date
Alleghany Memorial Hospital	Alleghany	Monarch	Enrolled	May 2015
Novant Ashe Memorial Hospital	Ashe	Novant	Enrolled	Sept 2014
Cannon Memorial Hospital	Avery	Monarch	Enrolled	May 2015
Vidant Beaufort Hospital	Beaufort	CCNC	Live	N/A
Vidant Bertie Hospital	Bertie	CCNC	Live	N/A
Dosher Hospital	Brunswick	CCNC	Enrolled	August 2014
Novant Brunswick Hospital	Brunswick	Novant	Enrolled	September 2014
Mission Memorial Hospital	Buncombe	Mission	Enrolled	July 2014
Blue Ridge Regional Hospital	Burke	Mission	Enrolled	July 2014
Caldwell Memorial Hospital	Caldwell	Monarch	Enrolled	May 2015
Carteret County General Hospital	Carteret	CCNC	Live	N/A
Catawba Valley Medical Center	Catawba	Monarch	Enrolled	March 2015
Chatham Hospital	Chatham	Monarch	Enrolled	September 2014
Vidant Chowan Hospital	Chowan	CCNC	Live	N/A
Columbus Regional Hospital	Columbus	CCNC	Enrolled	August 2014
Carolina East Hospital	Craven	CCNC	Live	N/A
Outer Banks Hospital	Dare	CCNC	Live	N/A
Lexington Medical Center	Davidson	CCNC	Live	N/A
Novant Thomasville Hospital	Davidson	Novant	Enrolled	July 2014

Hospital	County	Provider	Status	Projected Go-Live Date
Davie Hospital	Davie	CCNC	Enrolled	September 2014
Vidant Duplin Hospital	Duplin	CCNC	Live	N/A
Vidant Edgecombe Hospital	Edgecombe	CCNC	Live	N/A
Novant Clemmons Hospital	Forsythe	Novant	Live	N/A
Novant Forsythe Medical Center	Forsythe	Novant	Live	N/A
Novant Kernersville Hospital	Forsythe	Novant	Live	N/A
Novant Franklin Hospital	Franklin	Novant	Enrolled	October 2014
Halifax Regional Medical Center	Halifax	CCNC	Enrolled	July 2014
Our Community Hospital	Halifax	CCNC	Live	N/A
Betsy Johnson Hospital	Harnett	Monarch	Enrolled	May 2015
Harnett Hospital	Harnett	Monarch	Enrolled	April 2015
Vidant Roanoke-Chowan Hospital	Hertford	CCNC	Live	N/A
FirstHealth-Hoke	Hoke	Monarch	Enrolled	August 2014
Iredell Health System	Iredell	Monarch	Enrolled	February 2015
Lake Norman Regional Medical Center	Iredell	CCNC	Enrolled	August 2014
Harris Regional Medical Center	Jackson	Mission	Enrolled	February 2015
Lenoir Memorial Hospital	Lenoir	CCNC	Live	N/A
Angel Medical Center	Macon	Mission	Enrolled	September 2014
Highlands-Cashiers Hospital	Macon	Mission	Enrolled	October 2014
Martin County General Hospital	Martin	CCNC	Live	N/A

Hospital	County	Provider	Status	Projected Go-Live Date
McDowell Hospital	McDowell	Mission	Enrolled	July 2014
Novant Matthews Medical Center	Mecklenburg	Novant	Enrolled	September 2014
FirstHealth-Montgomery	Montgomery	Monarch	Enrolled	August 2014
FirstHealth-Moore	Moore	Monarch	Enrolled	August 2014
Nash Health Care	Nash	CCNC	Live	N/A
New Hanover Regional Medical Center	New Hanover	CCNC	Enrolled	May 2015
Onslow Memorial Hospital	Onslow	CCNC	Enrolled	November 2014
Albemarle Medical Center	Pasquotank	CCNC	Live	N/A
Pender Memorial Hospital	Pender	CCNC	Enrolled	August 2014
Person Memorial Hospital	Person	CCNC	Enrolled	January 2015
St Luke's Hospital	Polk	CCNC	Enrolled	August 2014
Randolph Hospital	Randolph	CCNC	Live	N/A
FirstHealth-Richmond	Richmond	Monarch	Enrolled	August 2014
Southeastern Hospital	Robeson	Monarch	Enrolled	February 2015
Morehead Memorial Hospital	Rockingham	Monarch	Enrolled	January 2015
Novant Rowan Hospital	Rowan	Novant	Enrolled	October 2014
Rutherford Hospital	Rutherford	Monarch	Enrolled	October 2014
Sampson Hospital	Sampson	CCNC	Enrolled	November 2014
Stokes-Reynolds Memorial Hospital	Stokes	Monarch	Enrolled	January 2015
Cherokee Indian Hospital	Swain	Monarch	Enrolled	April 2015

Hospital	County	Provider	Status	Projected Go-Live Date
Swain County Hospital	Swain	Monarch	Enrolled	March 2015
Transylvania Regional Hospital	Transylvania	Mission	Enrolled	August 2014
WakeMed Apex Healthplex	Wake	Monarch	Enrolled	August 2014
WakeMed Brier Creek Healthplex	Wake	Monarch	Enrolled	August 2014
WakeMed Cary Hospital	Wake	Monarch	Enrolled	August 2014
WakeMed Garner Healthplex	Wake	Monarch	Enrolled	August 2014
WakeMed North Healthplex	Wake	Monarch	Enrolled	August 2014
WakeMed Raleigh Hospital	Wake	Monarch	Enrolled	August 2014
Washington County Hospital	Washington	CCNC	Live	N/A
Blowing Rock Hospital	Watauga	Monarch	Enrolled	February 2015
Wayne Memorial Hospital	Wayne	CCNC	Live	N/A
Wilkes Regional Medical Center	Wilkes	Monarch	Enrolled	November 2014
Wilson Medical Center	Wilson	CCNC	Live	N/A
Yadkin Valley Hospital	Yadkin	CCNC	Enrolled	July 2014

Appendix B: North Carolina Telepsychiatry Workgroup Member Organizations

Carolinas HealthCare System
Community Care of North Carolina
Cone Health Behavioral Medicine
Duke University
East Carolina Behavioral Health
East Carolina University
MedAccess Partners
Mission Health Systems
NC DHHS, Division of Mental Health
NC Office of Rural Health and Community Care
North Carolina Hospital Association
UNC-Chapel Hill
Vidant Health
Wake Forest Baptist Health