

Community Paramedicine Pilot Programs

Session Law 2015-241, Section 12A.12.(a-e)

Session Law 2016-94, Section 12A.3



Report to the

**Joint Legislative Oversight Committee on
Health and Human Services**

and

Fiscal Research Division

By

**The North Carolina Department of Health and Human
Services**

March 1, 2017

Introduction

The Department of Health and Human Services (DHHS) submits this final report to the Joint Legislative Oversight Committee on Health and Human Services and to the Fiscal Research Division pursuant to Section 12A.12.(a-e) of Session Law 2015-241 and Section 12A.3 of Session Law 2016-94. The Division of Health Services Regulation is submitting this report on the administration of the funds that were allocated for the Community Paramedicine Pilot Program.

This report contains the following information:

- (1) An executive summary.
- (2) A summary of current operations from each pilot site.
- (3) A summary of clinical and fiscal findings for each pilot site.
- (4) An updated version of the evaluation plan required by SL 2015-241 12A.12.(d).
- (5) An estimate of any potential savings of State funds associated with the expansion of the program.
- (6) An estimate of the cost to expand the program incrementally and statewide.
- (7) A timeline for expanding the program.

It should be noted that Session Law 2016-94 Section 12A.3 amended Session Law 2015-214 Section 12A.12 (e), changing the date of the final report to March 1 2017. All other requirements of the pilot project remain outlined in Session Law 2015-214 12A.12 (a-e).

Executive Summary

Introduction:

In conjunction with the North Carolina Department of Health and Human Services (DHHS) and the Division of Health Service Regulation (DHSR), the North Carolina Office of Emergency Medical Services (NCOEMS) prepared a report on Community Paramedicine Pilot Programs for the Joint Legislative Oversight Committee on Health and Human Services and the Fiscal Research Division. Given the length of this report, NCOEMS has prepared an Executive Summary to emphasize the key findings of the report. More details regarding the information in this summary can be found in the full report.

Community paramedicine, also called mobile integrated health care, strives to improve health outcomes while being a potential cost savings to states, communities, and consumers of healthcare services across the country. Local EMS personnel are at the heart of many new community-based innovations. In addition to providing traditional emergency care, EMS personnel are providing a variety of non-emergent care and cost-effective options by helping patients' manage their chronic diseases, avoid emergency department (ED) visits and subsequent hospital admissions, adhere to medication plans, and access social services in rural and urban areas throughout the country. While each community's program operates differently, the goals are similar: improve individual and community health, reduce unnecessary hospitalizations and ED visits, improve patient satisfaction, and reduce healthcare costs.

Session Law 2015-241 Section 12A.12 (a-e), provided the sum of three hundred fifty thousand dollars (\$350,000) for a Community Paramedicine Pilot Program. Section 12A.12.(c) allowed the Department of Health and Human Services (DHHS) to establish up to three (3) program sites to implement the community paramedicine pilot program. The three program sites that were selected to participate in the pilot program represent the three NCOEMS geographic regions of the State (East, Central, and West) and provide a cross-sectional sample of community paramedicine programs within North Carolina.

Region	Site	Population	Program Focus	EMS System Type	Award Amount
West	McDowell	Micropolitan (44,996)	Reduce unnecessary emergency and 911 services	County Based	\$70,000
East	New Hanover	Medium Metropolitan (202,667)	Reduce hospital readmissions	Hospital Based	\$210,000
Central	Wake	Large Central Metropolitan (900,993)	Utilize alternative destinations for patients who do not need to be seen in an ED.	County Based	\$70,000

Pilot Results:

McDowell County EMS (MCEMS) closely examined high volume EMS and ED utilizers. They enrolled 230 patients in their Community Paramedic program between April 1, 2016 and October 31, 2016. During this pilot, 125 EMS and ED visits were avoided by services provided through the Community Paramedic program. They avoided a total of \$102,833 in services, at an average savings of \$822.66 per event.

New Hanover Regional Medical Center EMS (NHRMC-EMS) focused on reducing in hospital re-admissions. In FY 2016, NHRMC-EMS Community Paramedics were able to perform a total of 3,055 patient visits with 824 new patients. These patients were then compared to the overall numbers for the hospital. Community Paramedic patients had a 5-7% reduction in re-admission when compared to the re-admission rates for all patients in the hospital. NHRMC-EMS also studied high utilizers of EMS and ED services. They enrolled 20 of the highest utilizers into the Community Paramedic program and compared their utilization of services for 1 year before and 1 year after the intervention of Community Paramedicine. They found a \$558,000 decrease in expenses (21.7% reduction), with a \$78,621 decrease in median charge per patient (\$123,046 pre-intervention and \$44,425 post-intervention).

Wake County EMS (WCEMS) evaluated the use of alternative destinations for mental health and substance abuse patients. From January 1, 2016 through November 30, 2016 they evaluated 1191 patients for potential alternative destination. Of the 1191 patients, 251 were able to remain at home and 303 were able to be transported to a facility other than an ED. Of the patients who were transported to the ED, 53 were transported due to lack of capacity at an appropriate alternative destination facility. WCEMS also partnered with Community Care of Wake and Johnston Counties (CCWJC) to evaluate providing gap coverage for congestive heart failure patients. The preliminary pilot results followed 8 patients for one year. CCWJC analyzed both emergency department and inpatient costs for one year before and after enrolling into the program. They found a reduction of \$19,090.45 in Medicaid ED expenses and a \$31,179.47 reduction in Inpatient Medicaid expenses. Additionally, 50% of these patients had no hospitalizations one year after the program.

Statewide Expansion:

Estimating expansion costs and savings is incredibly difficult due to how much every Community Paramedic program differs in program type, location, community resources, staff, population, etc. The only program type that could be considered for expansion to all of North Carolina would be the reduction in high volume EMS and ED utilizers.

Expansion Costs:

To estimate the costs of expansion of the Community Paramedic program Statewide for high volume EMS and ED utilizers, the reimbursement rates established by the Division of Mental Health, Developmental Disabilities, and Substance Abuse (DMH/DD/SA) services were applied to the estimated number of EMS transports potentially reduced by Community Paramedics. The

estimated cost for expansion to all payor sources is \$4,722,822 - \$6,568,036. The estimated cost for expansion to Medicaid only is \$845,385.13 - \$1,175,678.44.

Expansion Savings:

In making these projections, NCOEMS identified 17,763 patients as high utilizers (4 or more 911 calls for EMS in one year) in 2015. These patients accounted for 141,176 EMS calls and 103,221 EMS transports. Using data provided from both New Hanover Regional Medical Center EMS and Wake County EMS, a range of possible reduction percentages was established and applied to the projected statewide high utilizers. Using the cost estimates from the North Carolina Division of Medical Assistance (DMA), NCOEMS applied the costs of an ambulance transport to the projected range of calls that would be reduced. An estimate of ED savings was also calculated using the same patient population. The combined (EMS and ED) gross savings estimates \$37,634,147 - \$52,337,302 in charges avoided for all payor types and \$1,355,681 - \$1,885,326 for NC Medicaid.

Totals:

When combining both the estimated costs and savings, there is a potential net savings:

- \$32,911,325 - \$45,769,266 for all payor sources (EMS and ED)
- \$510,295.87 - \$709,647.56 in NC Medicaid claims paid out (EMS and ED)

Summary:

Community Paramedicine is not a universal program, such as traditional 911 services. Community Paramedicine serves to meet the needs of the community, by more effectively utilizing available local resources to assist patients. Each community will vary in terms of their own needs, capabilities, and resources. The variability in these programs makes any type of expansion estimates very difficult as the results achieved by these pilot sites cannot be applied to every county across the state. Each of the three programs used for this pilot study were vastly different, but they are effective in their respective areas.

EMS revenue is currently generated from reimbursement for transportation to the Emergency Departments. Community Paramedicine often seeks a way to avoid unnecessarily transporting patients to the Emergency Department. As a result, the operation of a Community Paramedic program is currently an uncompensated expense to the EMS agency and decreases its revenues. In many cases, EMS is incentivized to do the wrong thing for the patient if they want to be paid for their service. The current reimbursement/payment model for EMS must change in order to provide the right care for the patient, at the right time, and at a lower cost.

Background and Development

Community Paramedicine, also frequently called mobile integrated healthcare, strives to improve health outcomes and achieve cost savings for patients and payers. While the capacity of individual programs is determined by the needs and available resources in the community it serves, one of the fundamental goals of a Community Paramedicine Program is to expand the role of paramedics to provide preventative patient care and reduce unnecessary emergency services utilization. In essence, providing each patient with the right care, at the right time, for the lowest cost.

Session Law 2015-241 Section 12A.12 (a-e), provided the sum of three hundred fifty thousand dollars (\$350,000) for a Community Paramedicine Pilot Program. Section 12A.12.(c) allowed the Department of Health and Human Services (DHHS) to establish up to three (3) program sites to implement the Community Paramedicine pilot program. The North Carolina Office of Emergency Medical Services (NCOEMS) released a grant application soliciting interest throughout the state.

The first program site selected was New Hanover Regional Emergency Medical Services (NHREMS). NHREMS was designated to receive up to two hundred ten thousand dollars (\$210,000) in Session Law 2015-241 12A.12 (c). The other two program sites, McDowell County Emergency Medical Services (MCEMS) and Wake County Emergency Medical Services (WCEMS), were each awarded up to seventy thousand dollars (\$70,000).

The programs selected represent the three NCOEMS geographic regions of the State (East, Central, and West) and provide a cross-sectional sample of Community Paramedicine programs within North Carolina.

Region	Site	Population	Program Focus	EMS System Type	Award Amount
West	McDowell	Micropolitan (44,996)	Reduce unnecessary emergency and 911 services	County Based	\$70,000
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Pilot Programs

McDowell County Emergency Medical Services (MCEMS)

Overview:

The McDowell County EMS Community Care Program began on July 1, 2013 after receiving grant funding from the Kate B. Reynolds Charitable Trust. The program was designed around three main objectives: (1) addressing high utilization of EMS and Emergency Department (ED) services, (2) preventing readmissions for high risk patients, and (3) conducting community wellness events in rural areas of McDowell County.

McDowell Community Paramedics function under the direction of the agency's medical director, Dr. Edward St. Bernard. Currently there are 2.5 full-time equivalents (FTE) in the Community Paramedic Program. Patients are referred to the program from a variety of sources including physician offices, hospitals, EMS crews, 911 Centers, law enforcement officers, family members, Department of Social Services (DSS), and others within the region. Community Paramedics take a holistic approach in solving the immediate needs of each patient by safely and effectively navigating them to the most appropriate resources available within the community. The main objective is to improve patient outcomes through proper resource management with an intense focus on eliminating waste and reducing cost.

Since the beginning of the program several operational changes have been made including the startup of behavioral health diversions within McDowell County. Traditionally a patient experiencing a behavioral health emergency was transported via ambulance to a local emergency department. Through an integrated partnership with the local Managed Care Organization (MCO) and law enforcement, community paramedics are dispatched to all behavioral health calls where they perform a medical screening on scene to rule out a medical emergency. If the patient meets medical clearance and has a condition which could best be treated by a mental health professional, the community paramedic will transport the patient to the local behavioral health clinic. To date this program has diverted over 50 patients from the local ED who met medical clearance criteria in the pre-hospital setting and could be successfully diverted to an alternative destination.

The pilot project funded by the State of North Carolina has allowed the agency to purchase essential equipment for the McDowell Community Paramedic Program and provided critical training for Community Paramedics. The agency has developed new protocols, policies, and standard operating guidelines specifically for Community Paramedics. These new policies and procedures enhance safety and improve efficiency of the program. McDowell County EMS looks forward to continuing to provide at-risk citizens this valuable service that improves health outcomes, reduces costs, and increases patient satisfaction.

Results:

For the purposes of this pilot project, MCEMS enrolled 230 patients in their Community Paramedic program between April 1, 2016 and October 31, 2016. The primary focus of this pilot was to examine high volume EMS and ED utilizers. Figures 1.1, 1.2, and 1.3 below describe the demographics of this group.

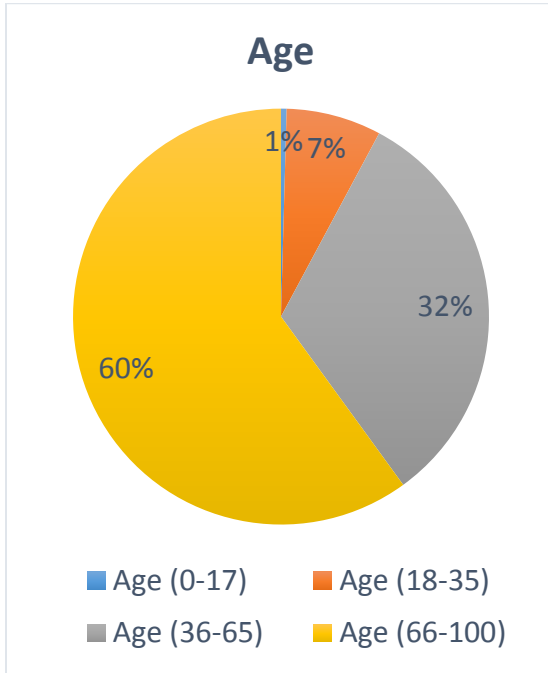


Figure 1.1

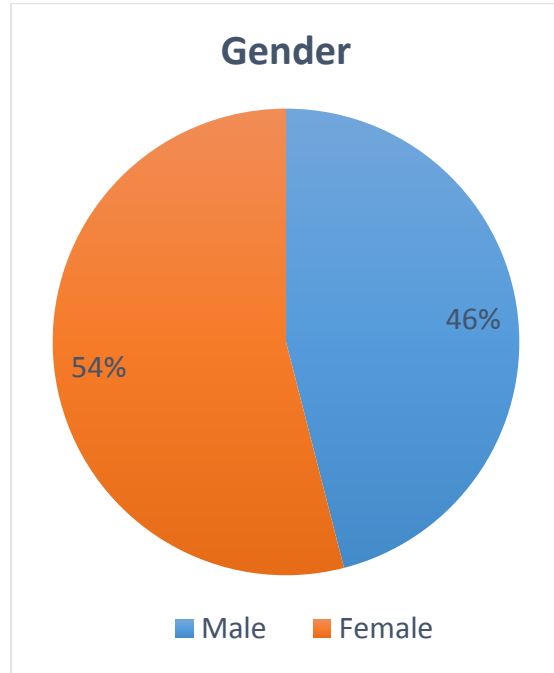


Figure 1.2

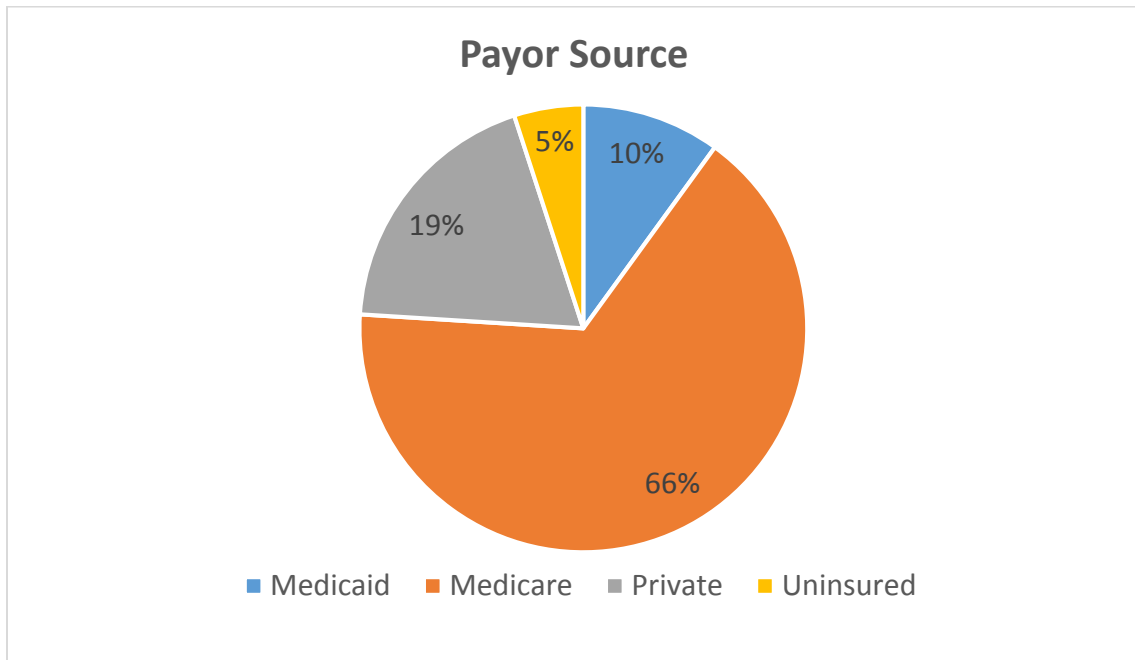


Figure 1.3

Of the 230 patients enrolled into the McDowell County EMS Community Paramedic program during this pilot, 125 EMS transports and ED visits were avoided. This is calculated based on the number of times a patient needs medical assistance and was not transported to the hospital. For example, a patient enrolled in the program calls the Community Paramedic and states that her blood pressure is high today. This call leads to a home visit where the Paramedic possibly finds that her home blood pressure cuff is not working properly, she is out of her medication, or that maybe her blood pressure is elevated. Her primary care physician (PCP) is then contacted and an appointment is made to follow up that day, if possible. Without the assistance of the Community Paramedic, the patient would have likely (it is recognized that this is an analysis limitation) called 911 for transport to the ED via an ambulance. Potential EMS/ED avoidance is calculated retrospectively from chart review in McDowell County. While it is an assumption that they would have been transported had the Community Paramedic not intervened, that assumption is based off their repeated history of high EMS and ED utilization, the trigger for them being enrolled into the high volume program initially.

The 125 transports that were avoided are then converted into a dollar amount based on assistance from the financial department at Mission Hospital in Asheville NC. Mission provides McDowell County EMS the average reimbursement (not billed rate) for the lowest acuity patient in the ED, for each payment type. The ED cost is then added to the average reimbursement rate for ambulance transports for each payment type, and the total is multiplied for each payment group. Figure 1.4 shows the breakdown by payor source and the potential cost avoidance for the 125 encounters during this pilot. The total estimated cost avoidance for the pilot was \$102,833. This figure is presumed to be quite conservative, but without financial analysts to assist in these calculations, it was the best estimate NCOEMS and McDowell County EMS could reasonably forecast.

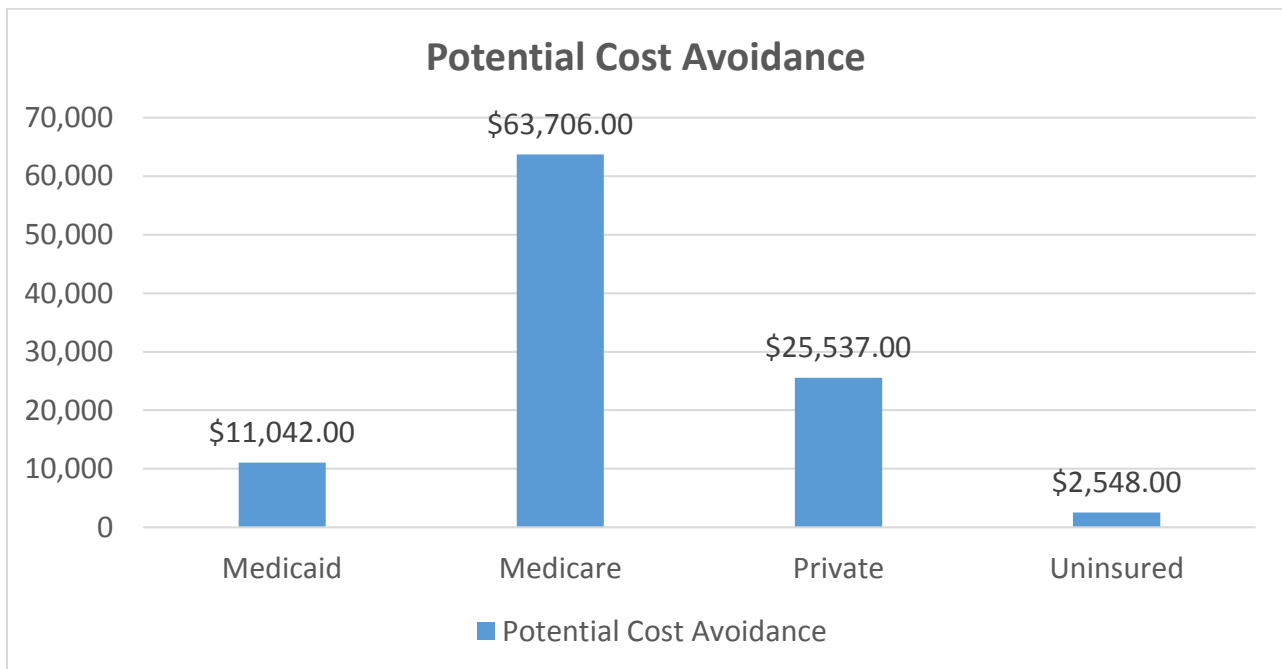


Figure 1.4

Case Study:

McDowell County EMS has a rural, aging population. One particularly significant case is that of an 81 year old female who began frequently calling EMS in 2003, but had a sudden spike in utilization in 2014. The table below (Figure 1.5) reflects her call volume over the last 4 years.

<i>Year</i>	<i>EMS Transports</i>
<i>2013</i>	3
<i>2014</i>	17
<i>2015</i>	4
<i>2016</i>	0

Figure 1.5

Upon enrolling the patient into the Community Paramedic program, it was quickly realized that she lives alone, does not have a primary care physician, does not have any family support, and does not have any mode of transportation. This patient is also dealing with anxiety, congestive heart failure, hypertension, and decreased mobility. She knows she is aging, she is scared, she is lonely, but she does not want to leave her home. With the Community Paramedic program, she received two or more visits per week to ensure that her needs were met. The Community Paramedic was able to link her with a primary care physician, providing her a medical home. Other community resources, such as food assistance and faith-based groups were engaged to help with her individual needs. Since becoming involved with the Community Paramedic Program, she did not call for EMS transport during 2016 and is down to just two Community Paramedic visits a month. She has been able to remain in her home and her loneliness and anxiety has decreased according to local EMS staff. The patient is happier and she is receiving the care that she needs and deserves. Moreover, this service is provided at a much lower cost to the healthcare industry as a whole, as opposed to activating the EMS system and transporting her to the ED every time she needs primary care.

Future Considerations:

McDowell County's program is grant funded through June 2018 by the Kate B. Reynolds Charitable Trust. The program will remain focused on its initial objectives, particularly behavioral health diversions and decreasing utilization of high utilizers. The McDowell County EMS 911 Division is projected to have a decrease in overall call volume for the second straight year due to the work of Community Paramedics to improve efficiency and referral patterns of enrolled patients. Currently, Community Paramedic services in McDowell County are only available during business hours on weekdays. Going forward, McDowell County would like to be able provide Community Paramedic services on the weekend. This would assist with high utilizers in crisis outside of business hours, as well as with the behavioral health diversion

program. Future expansion could include other types of alternative destinations and 911 diversion. This growth requires a stable funding model before the true potential of Community Paramedicine can be realized. Some model of reimbursement will be necessary for the sustainability of this program in the future. Additional changes must be made to the transportation model that EMS currently utilizes. Community paramedicine is a model which promotes improved outcomes, eliminates waste, and increases patient satisfaction.

New Hanover Regional Medical Center Emergency Medical Services (NHRMC-EMS)

Overview:

In early 2013, a retrospective review of 2012 response data revealed that 29% of 911 requests in New Hanover County were for “non-emergency” complaints. Additionally, just 10 patients accounted for over 700 EMS responses in a single year. EMS units were being increasingly delayed at emergency departments due to overcrowding. At the same time, NHRMC-EMS was actively engaged in planning to help meet New Hanover Regional Medical Center’s response to healthcare reform. They believed the principles of the Triple Aim could not only address the hospital’s needs, but also serve as a template to reduce the impact of high volume utilizers on the EMS system.

After completing a needs assessment and successfully piloting Community Paramedic concepts with a single patient, NHRMC began planning a Community Paramedic program based on three main goals:

- Reduce unnecessary 911 utilization and ED visits for the high utilization population;
- Lower NHRMC’s readmission rates; and
- Partner with area providers in healthcare system integration and care coordination.

In 2013 and 2014, NHRMC applied for and obtained grant funding from the Duke Endowment to develop the program and test concepts in transitional care. Throughout the grant periods, reports indicated that the Community Paramedic program could have significant impacts on successfully reducing re-admission, reducing unnecessary 911 utilization and ED visits, and functioning as integrated members of a transitional care team. Currently, the NHRMC EMS Community Paramedic Program operates with five full-time staff, covering a 50-mile radius from Wilmington NC. In FY 2016, over 3,000 patient visits were completed. There are three main patient groups currently targeted by NHRMC EMS Community Paramedics:

- NHRMC patients identified as high risk for a hospital re-admission;
- Proactively manage high utilizers of the emergency health care system; and
- Working with Community Care of Lower Cape Fear and Physician Quality Partners (ACO) to reduce re-admissions with patients participating in Medicare Shared Savings Plan (MSSP).

The pilot project funded by the SL 2015-241 has allowed NHRMC to support the salary of three full-time Community Paramedics. This funding was also used to purchase an additional Community Paramedic vehicle for completing patient home visits. Other needed technology, such as a laptop, was purchased to help document patient encounters.

Results:

For purposes of this pilot project, NHRMC EMS Community Paramedics primarily examined their reduction in hospital re-admission. In FY 2016, NHRMC-EMS Community Paramedics performed a total of 3,055 patient visits and saw 824 new patients (Figure 2.1). These patients were referred to the Community Paramedic program from various areas within the hospital. Figures 2.2 and 2.3 demonstrate whom referred the patients and the department where they came from within the hospital.

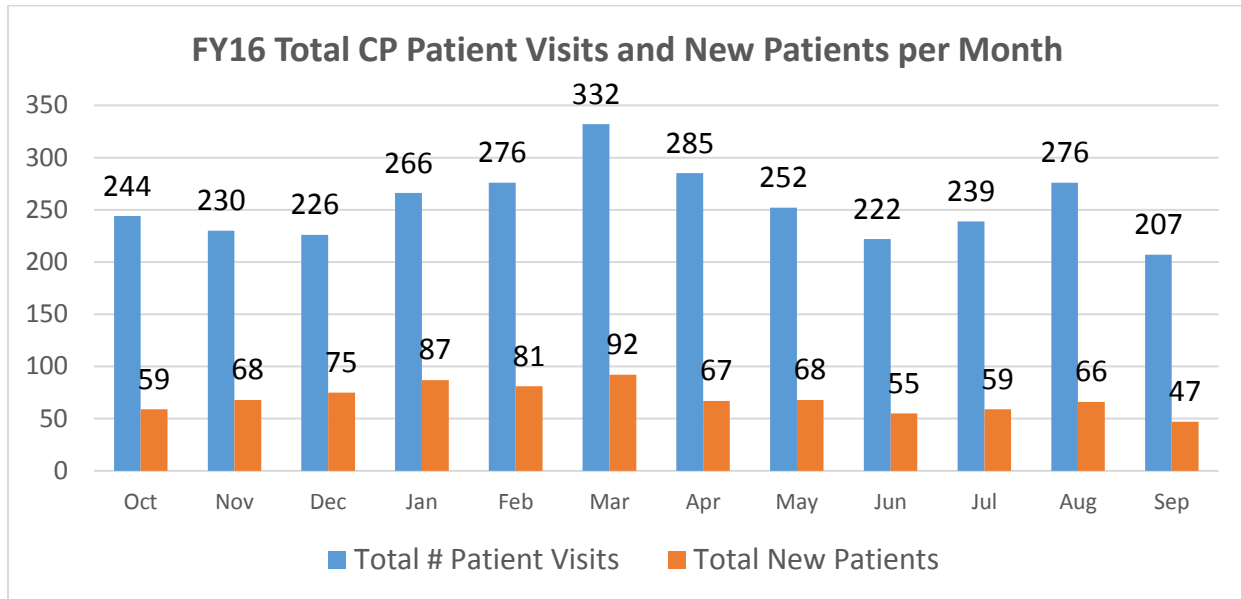


Figure 2.1

High Risk	58.6%
Other	16.0%
IP Floor Case Manager	7.8%
Case Management	6.6%
Transitionist	3.5%
IP Floor Social Worker	2.1%
Cardiologist	1.6%
MSSP List	1.4%
Pharm D	1.1%
Specialty Care Provider	1.0%

Figure 2.2

Cardiac Med Surgery	25.0%
Cardiac Telemetry	23.1%
General Medical/Diabetes	11.7%
General Admissions	10.9%
Pulmonary Oncology	9.3%
Nephrology	5.8%
Neuro Med Surgery	3.9%
Progressive Care	3.9%
Adult Inpatient Surgery	3.4%
Other	2.3%

Figure 2.3

Once a patient is enrolled into the Community Paramedic program and discharged from the hospital, they are scheduled for a home visit. Many factors can affect how quickly the patient can be seen in the home, but the goal (less than 5 days) is to minimize the time from discharge to first visit. Figure 2.4 shows the average number of days from discharge to the initial visit by the Community Paramedic.

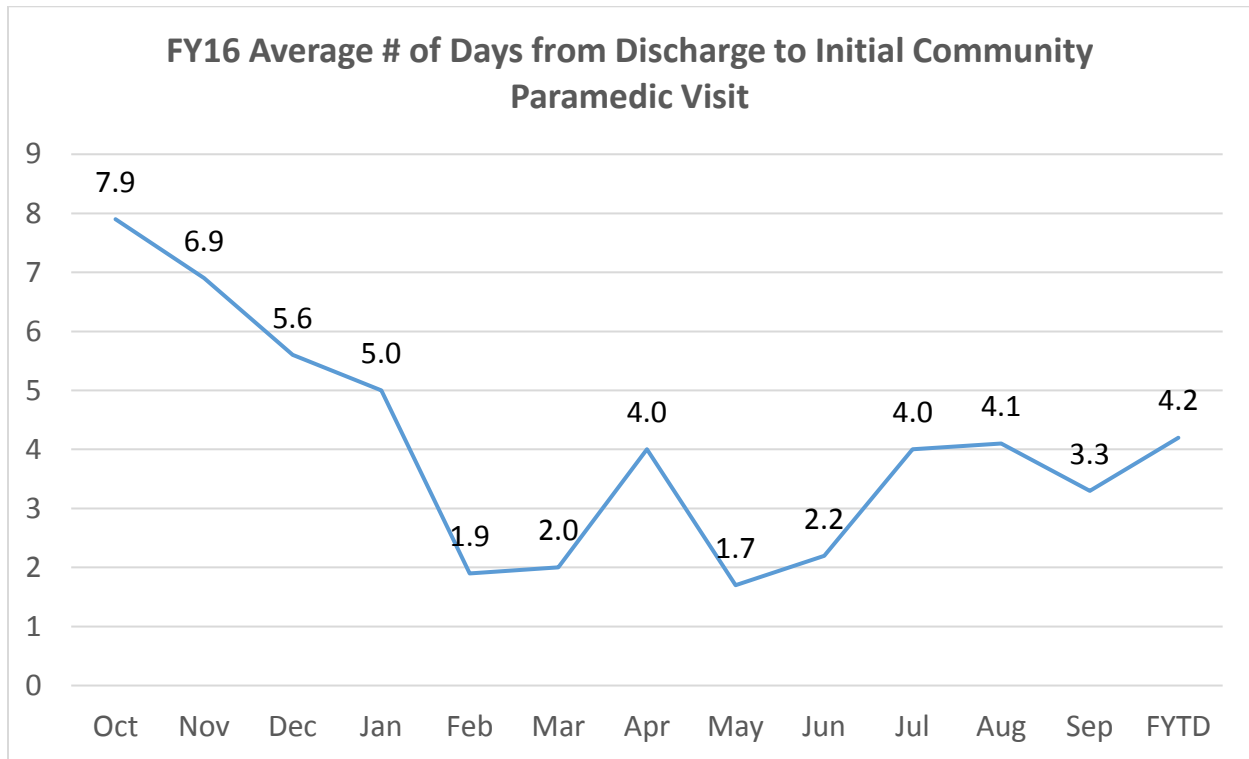


Figure 2.4

Once receiving the additional funding from this pilot project, it is noted that there was a vast improvement, due to the increased staffing levels. These home visits often consist of home safety checks, clinical assessments, medication review, education (nutrition, disease, etc.), and in some cases, treatment for identified medical needs. The goal of these home visits is to reduce re-admissions into the hospital. Goals regarding the amount of time from discharge to first visit are also being met.

The re-admission rate for NHRMC (all patients) was 18% for FY 2016. Hospitals are incentivized to lower re-admission rates in order to avoid Medicare financial penalties. The Community Paramedic program was able to assist 824 patients in FY 2016. Data on the re-admission rates for both the high risk patients and for all patients was collected and compared against the hospital (Figure 2.5). High risk (as determined by a hospital specialists) patients involved with the Community Paramedic program had a 13% readmit rate, 5% lower than the hospital average. All of the patients enrolled in the Community Paramedic program had an 11% readmit rate, 7% less than the hospital average.

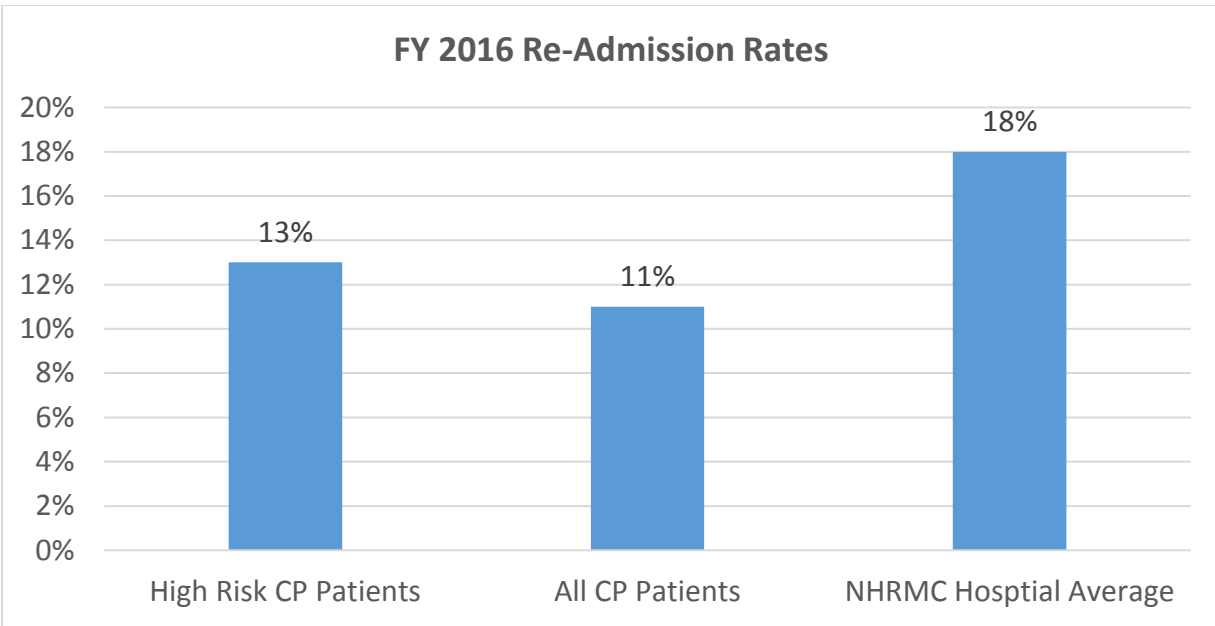


Figure 2.5

In addition to re-admission reduction, NHRMC also looked into high utilizers, recognizing this effects both EMS and the ED. Twenty of the highest volume utilizers were enrolled into the Community Paramedic program. For three months these patients were routinely visited and monitored while in the program. NHRMC was then able to track the patient call volume, transports, ED visits, and inpatient visits for the 12 months before and after the intervention.

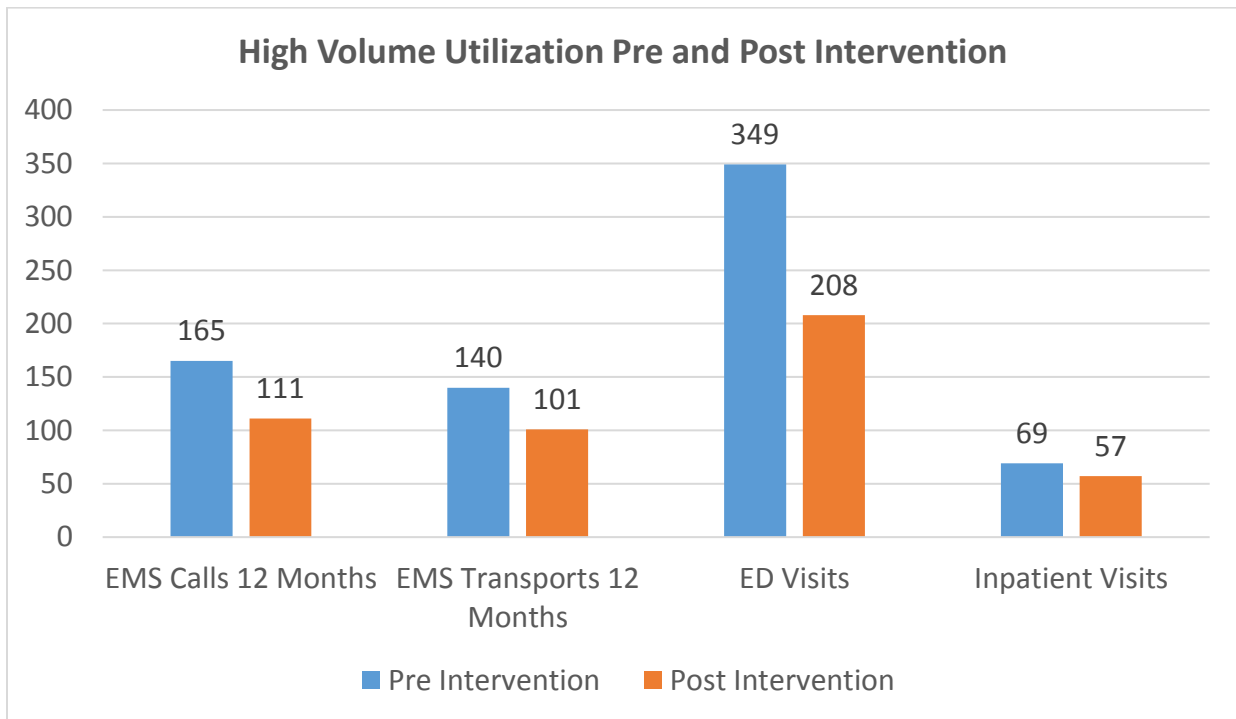


Figure 2.6

Over the course of the year, these 20 patients involved in the study had a:

- 32.7% decrease in 911 call volume
- 27.9% reduction in EMS transports
- 40.4% reduction in ED visits
- 17.4% reduction for inpatient hospitalizations

NHRMC then reviewed the actual charges for each of these patients (Figure 2.7). All charges for the patient (EMS, Emergency Department, and Inpatient) were combined for one year before and after enrollment into the program.

Over the course of the year, these 20 patients involved in the study had a:

- 21.7% reduction in charges (approximately \$558,000 in decreased expenses)
- \$78,621 decrease in the median charge per patient (\$123,046 pre-intervention and \$44,425 post-intervention)

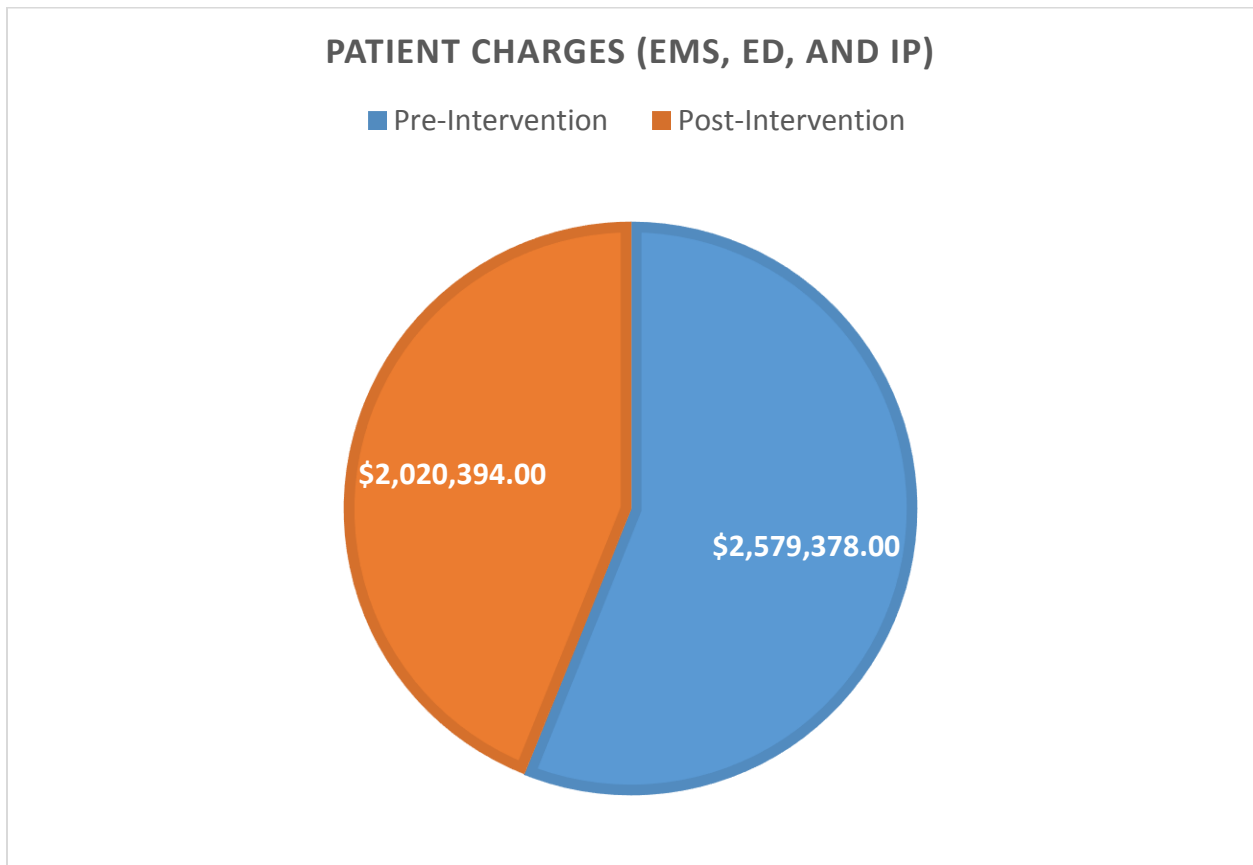


Figure 2.7

Case Study:

A local primary care physician was concerned about one of his patients that he felt needed additional help and was having difficulty finding the right resource. The patient arrived to his PCP office with his foley catheter disconnected and he was saturated in urine. Other resources had refused to assist the patient, so the PCP turned to the Community Paramedic program. The patient is a 75 year old male with a history of diabetes, renal failure, congestive heart failure, myocardial infarction, and poor medication compliance. Further research reveals that he has been seen at the ER and admitted to the hospital several times over the last year (see Figure 2.8). The hospital charges for those visits can be found in Figure 2.9.

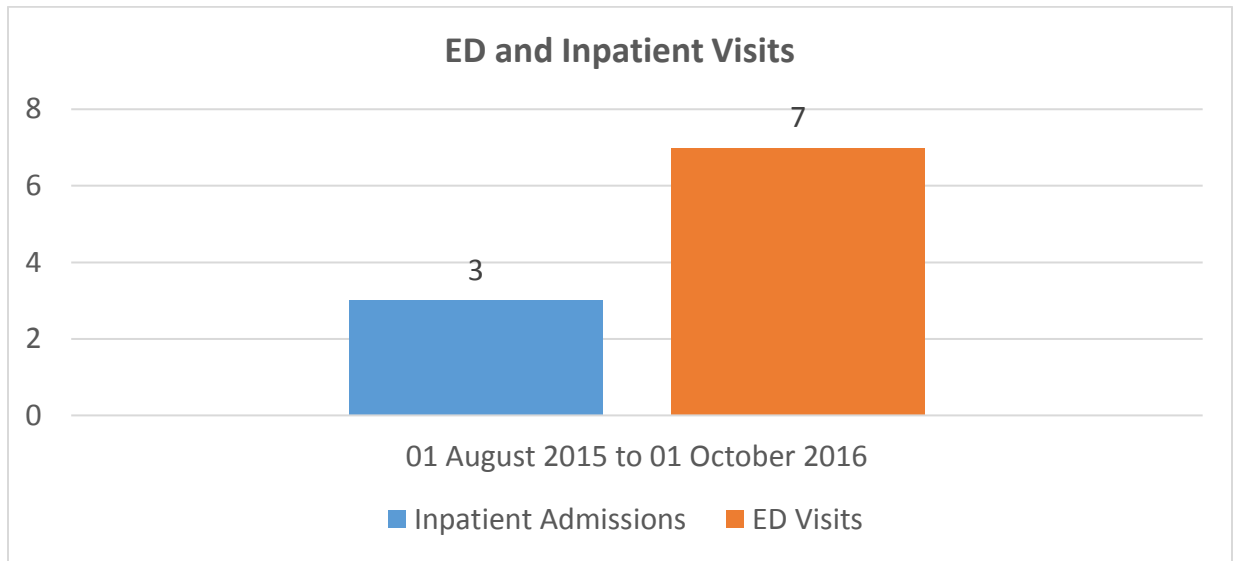


Figure 2.8

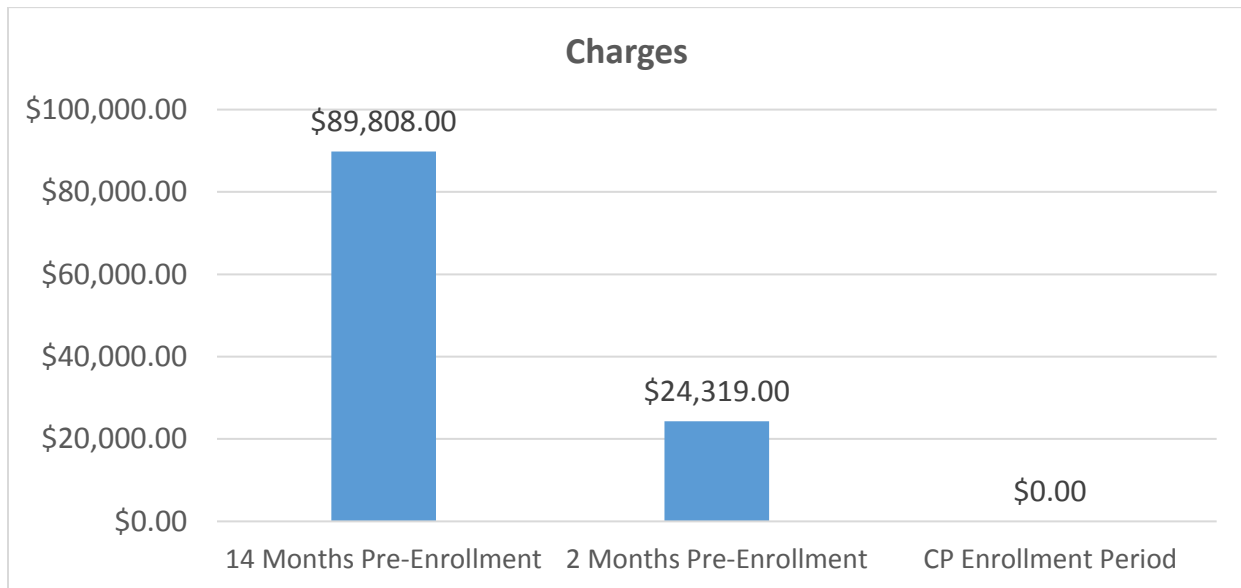


Figure 2.9

In the previous 14 months, the patient had accumulated nearly \$90,000 in hospital charges. The patient was admitted into the Community Paramedic program on October 5, 2016 and home visits started immediately.

The Community Paramedic went to the patient's home daily, Monday through Friday, for a total of 31 visits. It was discovered that the patient struggled with memory loss. There were also problems of substance abuse being encouraged by neighbors. Minimal family support was in place. The Community Paramedics attended the patient's doctor appointments with him, assisted with medication compliance, and reached out to family. Through work with the patient's niece and Adult Protective Services, he is being evaluated for mental health services and is in the process of being placed in an assisted living facility. He has not had any ED visits or hospital admissions since his enrollment into the Community Paramedic program. This patient has had a total change in his outlook on life due to the services that were provided by the Community Paramedic, a service that is much cheaper to operate and much more effective than as noted in the previous 14 months.

Future Considerations:

NHRMC EMS is continuously looking to improve services and expand where possible to meet the needs of the community. Some of the areas of program improvement that are currently being planned are:

- Addition of a Program Coordinator to provide more direct oversight of daily operations and to assist with strategic planning and program development
- Expansion of the program; adding an additional community paramedic to increase the ability to reach the high utilization population.
- Develop alternative transport protocols to be used by EMS and the community paramedic program to better meet the needs of substance abuse, mental health, and hospice patients.

Wake County Emergency Medical Services (WCEMS)

Overview:

The Wake EMS Advanced Practice Paramedic (APP) Community Paramedic program began in 2009. The program was approved and funded within the annual Wake County EMS Department operating budget. In 2011, the program was re-aligned under the Wake County EMS Office of Medical Affairs, to provide further program direction and expansion of clinical services. Currently, there are two APP supervisors and 14 full time personnel, staffing five units across the county.

The APP program has three primary functions, which are respond, reduce, and redirect. These goals are accomplished through relationships with various community partners to assist in successful navigation of patients for specialty evaluation and treatment.

Response: The APP's respond to high acuity 911 calls utilizing Emergency Medical Dispatch (EMD) codes of Delta and Echo. This allows for an experienced provider to respond and provide any needed assistance as well as on-scene clinical oversight for high acuity patients.

Reduce: The APP program also works with hospitals and health care systems to reduce burdens and costs of care with the goal of providing clinically excellent patient care at the right time and place for the patient. This includes working with high utilizers to create care plans with community partners, working with Community Care of Wake and Johnston County to provide gap coverage for congestive heart failure (CHF) and transitional care patients, along with various other efforts.

Redirect: In addition to studying and evaluating potential reductions in the unnecessary utilization of emergency services, the Wake EMS APP program is also active in redirecting subsets of patients to most appropriate care at the time of an EMS call. Most notably, one of the original Wake APP projects, ongoing today, is the redirection of acute mental health and substance use patients. As part of the 911 system response, APPs evaluate patients for acute mental health or substance use crisis. Using advanced medical decision making and a set of screening criteria, APPs attempt to redirect these patients to a primary psychiatric or substance use facility, rather than the emergency department, thereby getting these patients the right care the first time.

Results:

Wake County EMS evaluated a total of 1,191 mental health and acute substance use patients from January 1, 2016 through November 30, 2016. Below is a chart showing the results of these evaluations (Figure 3.1).

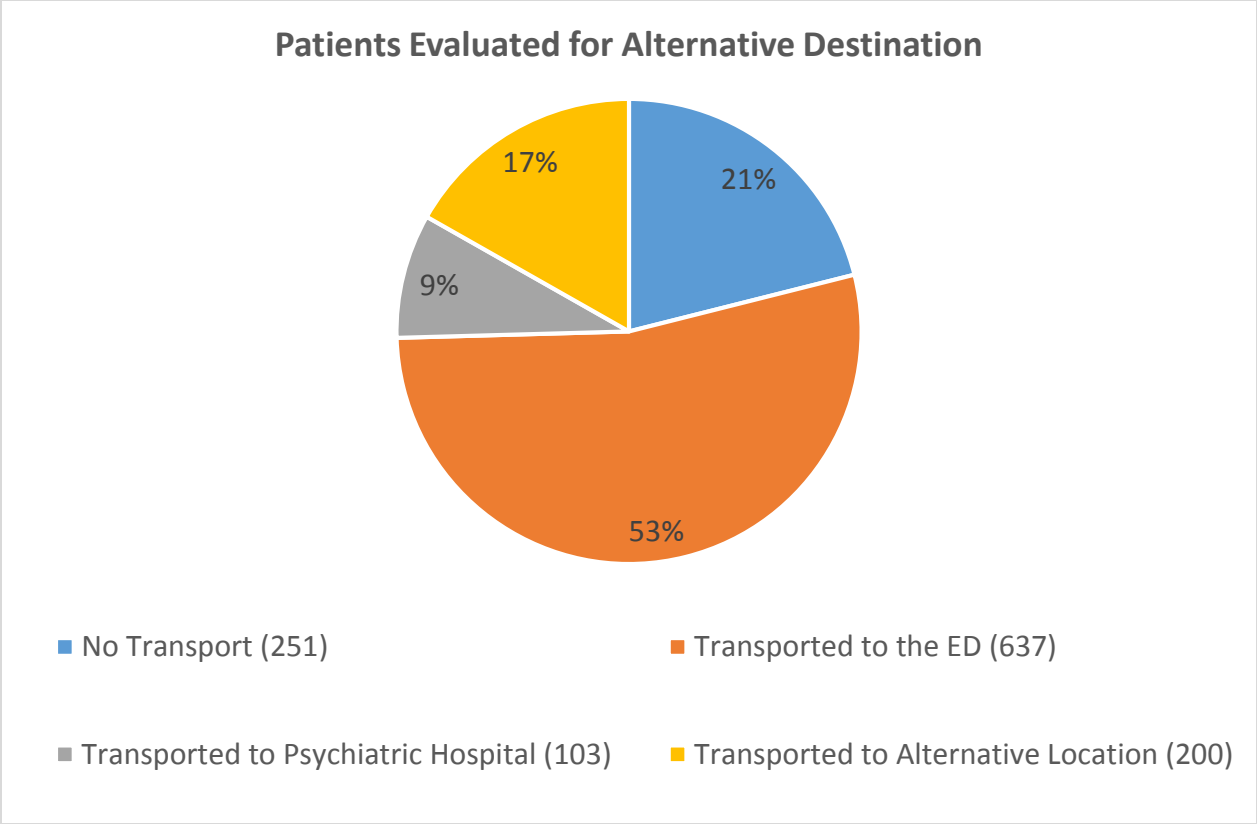


Figure 3.1

Of the 1,191 total patients evaluated, 53% (637 patients) were transported to the emergency department (ED) (more information regarding the patients who were transported to the ED can be found below in Figure 3.2). Of the patients who do not go to the ED, all are provided resources and an attempt is made to align them with an appropriate provider to handle their unique need, many of which are still able to remain at home (251, 21%). These patients do not want or do not need an alternative destination. The APP’s have training in crisis intervention and may be able to resolve the problem without the patient having to leave the home. Others remain at home and a mobile crisis staff member comes to their home in coordination with the paramedics. A total of 303 patients are transported by EMS to an alternative destination, either to a psychiatric hospital (103, 9%) or an alternative location (200, 17%), such as Wakebrook and Healing Transitions. Nearly half of the total patients evaluated were able to avoid the emergency department, saving time and money for both EMS and the hospital, while providing the patient with the most appropriate care.

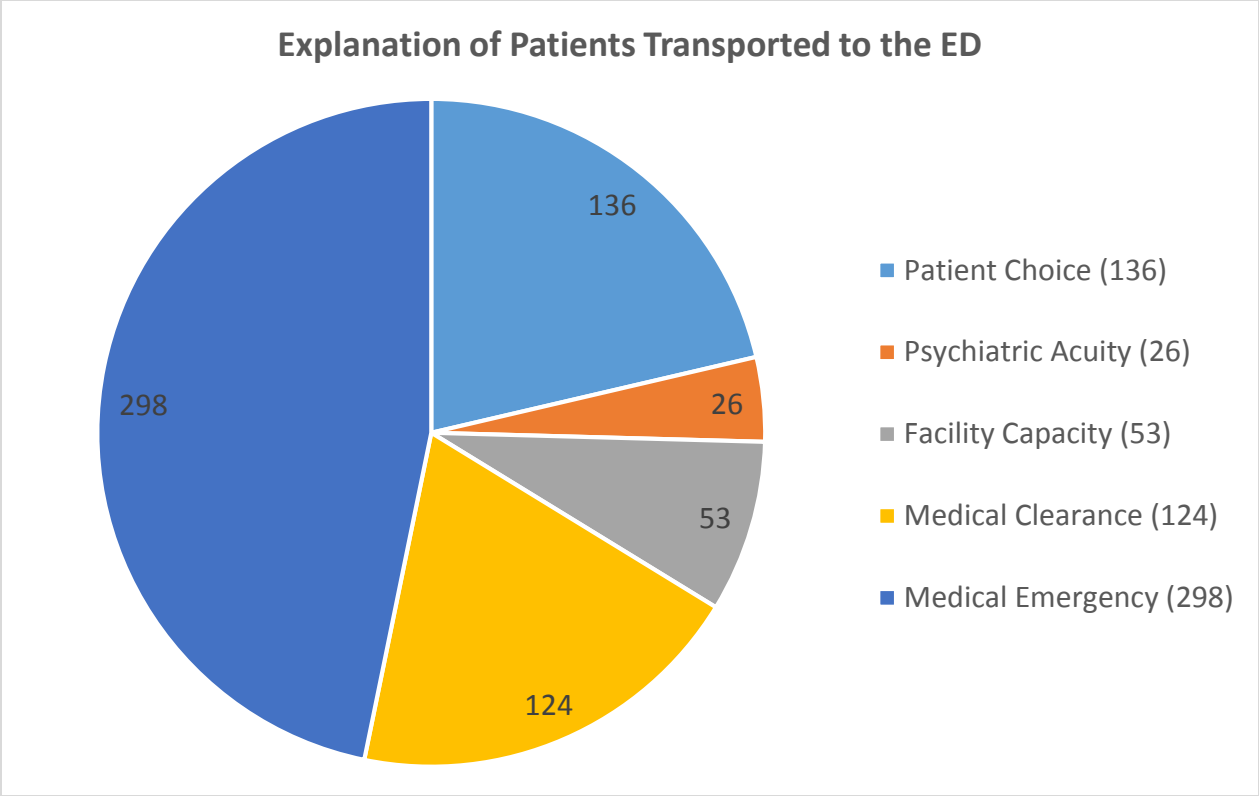


Figure 3.2

Figure 3.2 demonstrates the breakdown of why patients who were screened for alternative destination were transported to the ED. In total, 637 patients were transported to the ED during this time period (January 1, 2016-November 30, 2016). All patients that are having an acute medical emergency (47%, 298) (altered mental status, cardiac abnormalities, wound repair, etc.) still require evaluation and treatment by an emergency physician. Medical clearance is required for patients who do not pass the EMS screening criteria for alternative destination (20%, 124). For many of those that are not experiencing an acute medical crisis, they still have the right to request transport to the ED, even if all screening criteria are met for alternative destination (21%, 136).

Another important note regarding those that are transported to the ED is the 8% (53 patients) who were transported to the hospital because the mental health facility did not have capacity to take any additional patients. These patients passed all screening criteria, yet due to overcrowding, they were forced to use the emergency department.

Wake County EMS also reviewed the payor source for each of the 1,191 patients evaluated and the 637 patients that were transported to the ED. Figure 3.3 represents the payor source for the entire sample of patients evaluated and for the subset of those who were transported to the ED. The seven different payment categories were the same as what was used for the DMH/DD/SA grant outlined in the final report for Session Law 2015-241 12F.8.

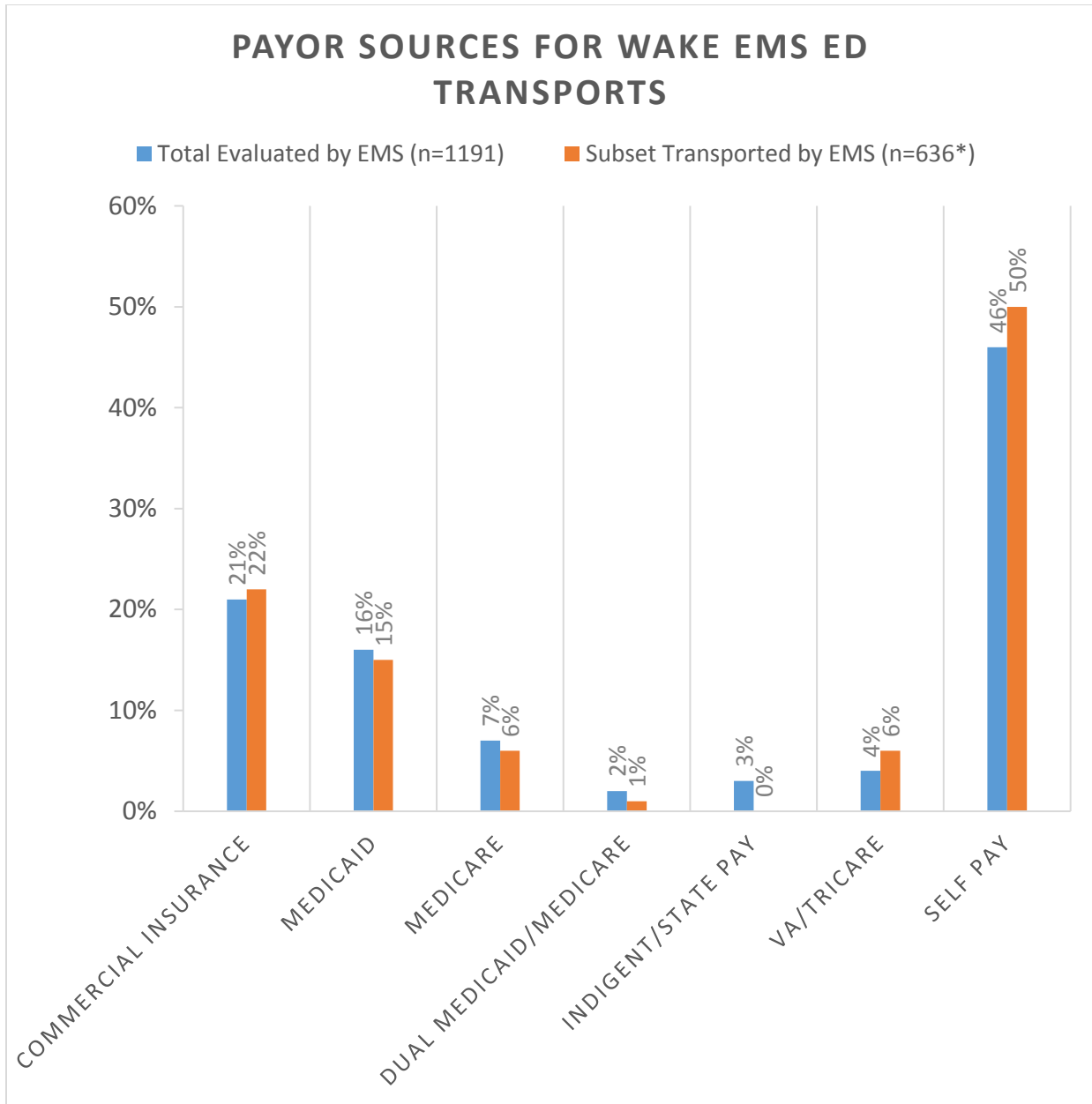


Figure 3.3

**It is recognized that 637 patients were transported to the ED, yet this chart shows results for 636. Wake County EMS was unable to find the payment source information for 1 patient who was transported. .*

In addition to facilitating alternative destinations for mental health/substance use patients, APP's also are responsible for responding to high acuity 911 calls. While many other Community Paramedic programs do not involve an emergency 911 component, the APP program helps supplement the 911 system to ensure an experienced paramedic assists on high acuity calls. From January 1, 2016 through November 30, 2016, APP's responded to 12,750 calls via 911. These calls range from high velocity motor vehicle crashes, cardiac arrests, overdoses, and a variety of other severely sick and/or injured patients. APP's also work to create care plans for

high volume utilizers. These care and destination plans are created collaboratively with the administration at Wake EMS, the APP, local hospital staff, Community Care of Wake and Johnston County, and adult protective services. Currently there are 60 patients with a pre-determined care plan. Figure 3.4 shows the change in call volume for five of the highest utilizers.

This example illustrates the potential change that the Community Paramedic intervention can have on its patients. It must be noted, it is important to have consistent and appropriate management of care for high volume utilizers to ensure they are receiving appropriate care for their complex conditions. These care plans help facilitate that care for this particular subset of patients. The potential reduction in even just a small percentage of high utilizers can have a tremendous impact on call volume, transports, ED utilization, inpatient admissions, healthcare costs as a whole, and individuals overall health.

<i>Patient</i>	<i>Average Number of EMS Calls (Per Month) Prior Care Plan Implementation</i>	<i>Average Number of EMS Calls (Per Month) Post Care Plan Implementation</i>
<i>A</i>	7.61	1.88
<i>B</i>	3.47	1.83
<i>C</i>	2.65	2.50
<i>D</i>	2.33	0.12
<i>E</i>	2.33	1.33

Figure 3.4

Another component in the APP program is their partnership with Community Care of Wake and Johnston County (CCWJC). In this effort, Paramedics provide gap coverage for congestive heart failure (CHF) and transitional patients that have been recently discharged home. When a patient is sent home on weekends, holidays, and other busy times, there can be a delay in beginning home care, so the APP is able to fill that gap immediately, assisting with patient needs until CCWJC and other partners are able to visit the patient. Between January 1, 2016 and November 30, 2016, APP's were able to assist with 57 Community Care patients, conducting a total of 169 home visits. This information was tracked by Wake County EMS during the pilot program with the intention of Department of Health and Human Services (DHHS) partners being able to provide specific details regarding expenditures and savings with each of these patients. Unfortunately, no fiscal results were analyzed by DHHS and therefore limited calculations were performed regarding cost savings. While no specific details regarding the 2016 cohort are available, CCWJC was able to provide details regarding eight patients that were monitored for 12 months pre- and post- entry into the program.

Patients were monitored for one year after enrollment into the APP CHF program with CCWJC. Their costs were then compared to the year prior to enrollment (Figure 3.5).

- Inpatient costs to Medicaid were reduced by 62% (\$31,179.47)
- ED costs to Medicaid were reduced by nearly 75% (\$19,090.45)
- 50% of the patients had no hospitalizations one year after the program

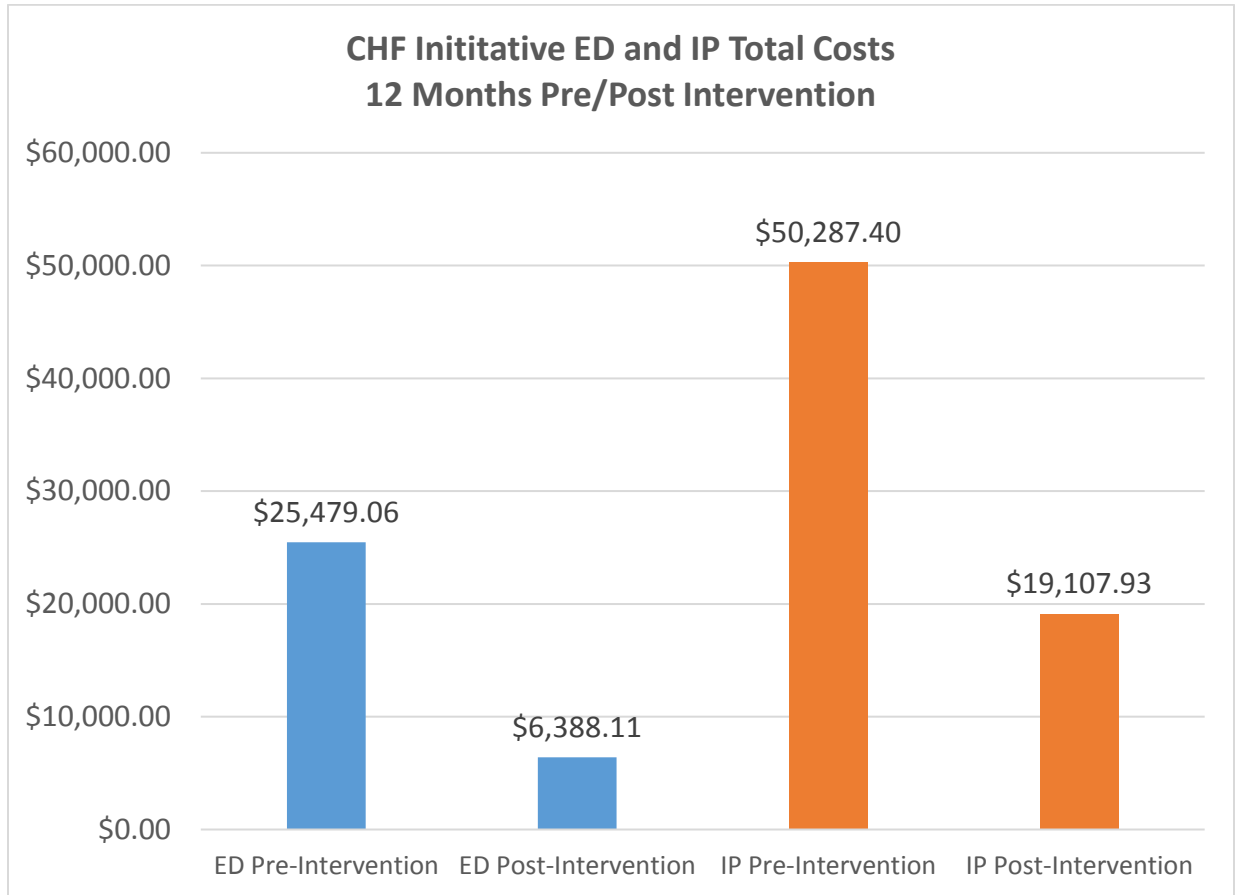


Figure 3.5

Case Study:

A prime example of the APP program making an impact is in the case of a 46 year old male who would frequently call 911, often times with substance use related problems. Figure 3.6 below demonstrates his 911 call volume since 2010.

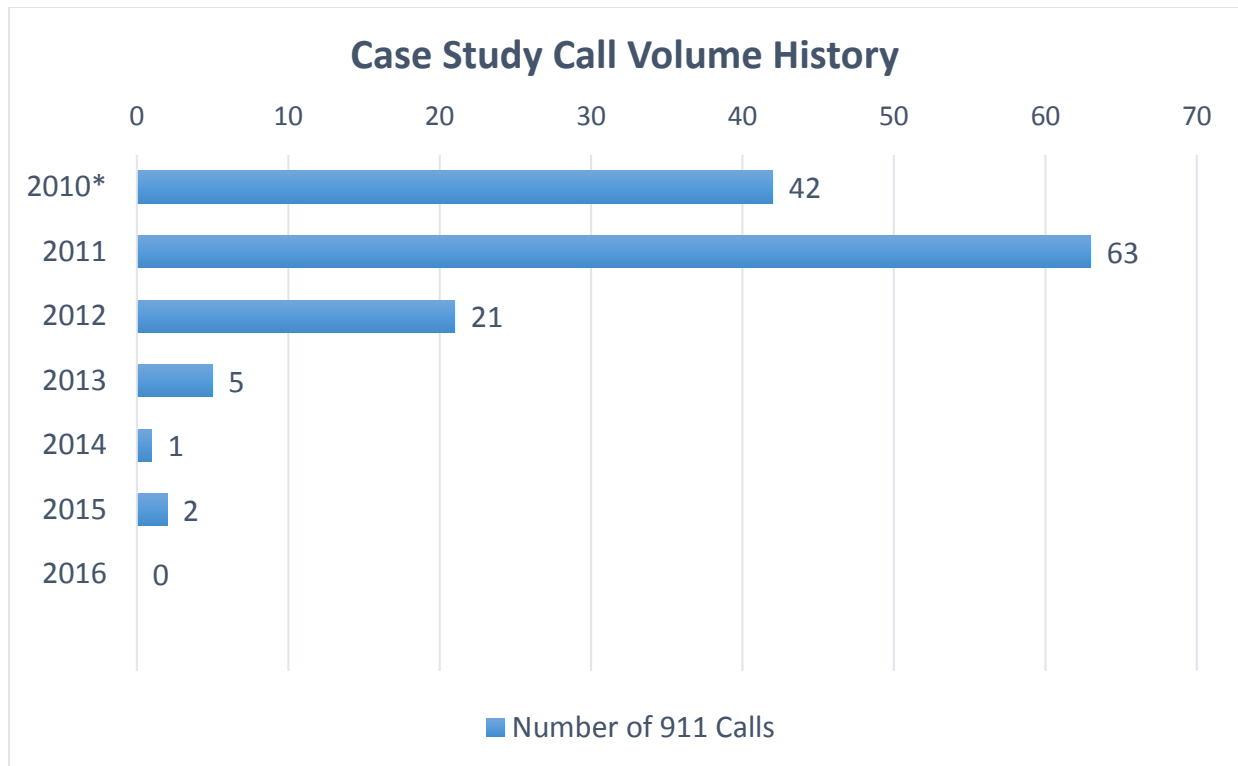


Figure 3.6

**2010 Data is incomplete due to a change in patient care reporting software halfway through the year. It is believed that the volume for the full year was 80 calls.*

In 2011, the APP’s began visiting regularly with this patient and created a care plan. They found him to be uninsured, homeless, unemployed, and struggling with addiction. This patient required constant engagement and was transported regularly to Healing Transitions for substance use treatment. Typically this patient did not need an emergency department, he needed treatment for his addiction, which often requires countless attempts before it is successful. This consistency and dedication to taking him to the appropriate facility is what lead to his sobriety in 2013. Since this time there has been a sharp decrease in his call volume. He has also come back to EMS continuing education sessions to share his story with all of the EMS providers across the county and to thank the EMS community for continuing to assist him at a time when few others would. Currently, he is 52 years old, sober, employed, and living a productive life due to the assistance he received, through the APP program in Wake County.

CCWJC also provided details regarding another case study involving the APP program and their CHF transitional care partnership. This 46 year old patient had been admitted to the hospital for over 200 days in FY 2014-2015, with a primary diagnosis of CHF. The patient was enrolled in the pilot program in April of 2015. The APP was able to make a home visit within the first 24 hours of discharge. Once in the home, a medication gap was realized and the APP worked with the care manager to resolve the issue. Other services, such as education and patient monitoring, were provided by the APP. A joint home visit with both CCWJC and the APP was conducted within four days of discharge. CCWJC was able to review the health care expenses for this

patient, looking at both three months prior to intervention and three months post intervention (Figure 3.7). It only cost \$557 Medicaid dollars to treat this patient for three months after entrance into the APP program, as opposed to the \$103,000 spent in the previous three months.

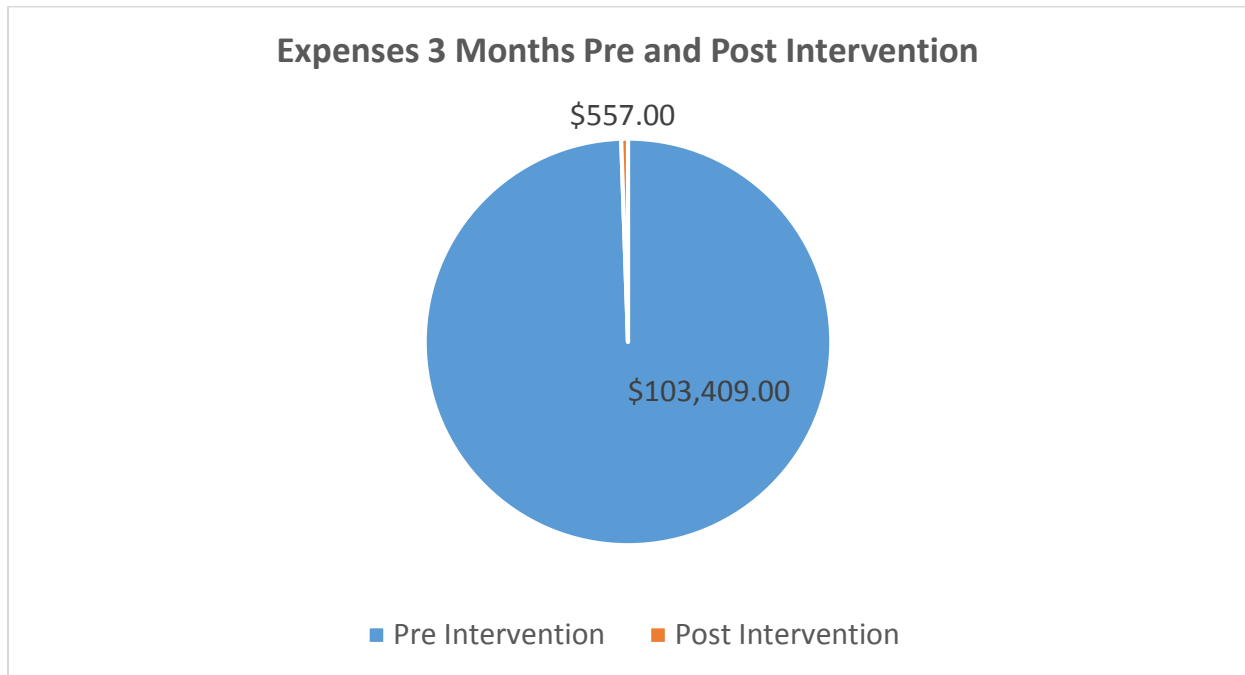


Figure 3.7

Future Considerations:

The Wake EMS APP program needs to add additional personnel to meet the growing 911 call volume, number of home visits and increased services with other program initiatives. This program has had many successes in terms of getting patients the right care at the right time with greater satisfaction and lower costs, but now demand for these services is outpacing the supply of available resources.

In 2017, Wake County EMS has budgeted to add four additional APPs and two APP supervisors to assist in meeting this need. However, these additional resources are being added at the expense of the annual EMS operating budget and funded by all Wake County tax payers. While the county is working with individual partners to attempt to develop mechanisms for ongoing funding for specific programs, the overarching need is for EMS reimbursement reform such that these Community Paramedic services have a sustainable and established funding stream similar to billing and coding for “traditional” ambulance transport.

The growth of the program in personnel and reimbursement support will help provide Wake County EMS with the ability to meet the increasing demand for service. Program expansion will provide for increased APP services, including more high acuity response, further work with high volume utilizers, greater hospital readmission reduction and increased capacity for mental health and substance use patient navigation.

HRSA Evaluation Tool

In accordance with Session Law 2015-241, Section 12A.12. (e), this report includes an evaluation based on the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA) Office of Rural Health Policy Community Paramedic Program Evaluation tool published in March 2012.

HRSA's Office of Rural Health Policy's Community Paramedic Program Evaluation Tool is designed to provide a benchmark for self-study and to measure ongoing progress of public health resources, policies, and procedures. Before and after the pilot program, each grant recipient used the tool to provide an independent self-assessment of its program's capabilities, strengths, weaknesses, and effective utilization of resources.

When compared to the initial evaluation completed by each pilot site and submitted on June 1 2016, there were no changes to the results due to the fact that each of the programs in this pilot have been established for several years, having already undergone the growing pains faced by a new program. Established programs were selected for participation in the pilot in order to collect and analyze the results of Community Paramedicine programs and estimate the potential savings and cost for expansion. A brand new Community Paramedic program would expect to have quite a bit of change during their initial evaluation. Additionally, some of the benchmarks are related to community resources, which might not change or adopt as quickly as the EMS agencies. While there were not any changes to the median scores for each program, the pilot sites did believe that this tool was a good way to ensure that they are reviewing resources, processes, and procedures regularly.

Below is a table explaining each benchmark, followed by tables showing the median scores for each program sites' "after" assessment. The scores for each site cannot be used to compare programs to one another due to the differences in population, program focus, and EMS service types referenced above. Rather, they indicate opportunities for improvement within the individual program.

Benchmark	Explanation
101	There is a thorough description of the epidemiology of the medical conditions targeted by the community paramedicine program in the service area using both population-based data and clinical databases.
102	A resource assessment for the community paramedicine program has been completed and is regularly updated.
103	The community paramedicine program assesses and monitors its value to its constituents in terms of cost-benefit analysis and societal investment.
201	Comprehensive statutory authority and administrative rules support community paramedicine program infrastructure, planning, provision, oversight, and future development.
202	Community paramedicine program leaders (sponsoring agency, community paramedicine personnel, and/or other stakeholders) use a process to establish, maintain, and constantly evaluate and improve a community paramedicine program in cooperation with medical, payer, professional, governmental, regulatory, and citizen organizations.
203	The community paramedicine program has a comprehensive written plan based on community needs. The plan integrates the community paramedicine program with all aspects of community health including, but not limited to: EMS, public health, primary care, hospitals, psychiatric medicine, social service and other key providers. The written community paramedicine program plan is developed in collaboration with community partners and stakeholders.
204	Sufficient resources, including those both financial and infrastructure related, support program planning, implementation, and maintenance.
205	Collected data are used to evaluate system performance and to develop public policy.
206	The community paramedicine, EMS, public health, community health, and primary care systems are closely linked and working toward a common goal.
301	The electronic information system (EIS) is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the community paramedicine.
302	The financial aspects of the community paramedicine program are integrated into the overall performance improvement system to ensure ongoing “fine-tuning” and cost-effectiveness.
303	The community paramedicine program ensures competent medical oversight.
304	The community paramedicine program is supported by an EMS system that includes communications, medical oversight, and transportation; the community paramedicine program, EMS system, and public health and community health agencies are well integrated.
305	The community paramedicine program ensures a competent and safe workforce.
306	The program acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to the community paramedicine program.

McDowell County EMS Evaluation:

Each indicator is scored from 0-5 based off the provided template. The median score is used to demonstrate where the agency lies for each benchmark.

Indicator	Median Score
100: Assessment: Regular systematic collection, assembly, analysis, and dissemination of information on the health of the community.	
101.1-101.5	4
102.1-102.4	4.5
103.1-103.5	4
200: Policy Development: Promoting the use of scientific knowledge in decision making that includes building constituencies, identifying needs and setting priorities, legislative authority and funding to develop plans and policies to address needs, and ensuring the public's health and safety.	
201.1-201.2	2.5
202.1-202.6	4.5
203.1-203.2	4
204.1-204.3	4
205.1-205.3	3
206.1	4
300: Assurance: Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulation, or providing services directly.	
301.1-301.2	4
302.1-302.3	3
303.1	2
304.1	2
305.1-305.5	1
306.1-306.2	4.5

New Hanover Regional Medical Center EMS Evaluation:

Each indicator is scored from 0-5 based off the provided template. The median score is used to demonstrate where the agency lies for each benchmark.

Indicator	Median Score
100: Assessment: Regular systematic collection, assembly, analysis, and dissemination of information on the health of the community.	
101.1-101.5	5
102.1-102.4	5
103.1-103.5	4
200: Policy Development: Promoting the use of scientific knowledge in decision making that includes building constituencies, identifying needs and setting priorities, legislative authority and funding to develop plans and policies to address needs, and ensuring the public's health and safety.	
201.1-201.2	2
202.1-202.6	5
203.1-203.2	4.5
204.1-204.3	3
205.1-205.3	3
206.1	4
300: Assurance: Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulation, or providing services directly.	
301.1-301.2	4.5
302.1-302.3	2
303.1	5
304.1	5
305.1-305.5	3
306.1-306.2	4

Wake County EMS Evaluation:

Each indicator is scored from 0-5 based off the provided template. The median score is used to demonstrate where the agency lies for each benchmark.

Indicator	Median Score
100: Assessment: Regular systematic collection, assembly, analysis, and dissemination of information on the health of the community.	
101.1-101.5	4
102.1-102.4	1
103.1-103.5	4
200: Policy Development: Promoting the use of scientific knowledge in decision making that includes building constituencies, identifying needs and setting priorities, legislative authority and funding to develop plans and policies to address needs, and ensuring the public's health and safety.	
201.1-201.2	3
202.1-202.6	4.5
203.1-203.2	1.5
204.1-204.3	4
205.1-205.3	4
206.1	3
300: Assurance: Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulation, or providing services directly.	
301.1-301.2	4.5
302.1-302.3	2
303.1	5
304.1	5
305.1-305.5	5
306.1-306.2	5

Statewide Expansion Savings

Estimates for expansion of community paramedicine statewide are difficult to calculate. Community paramedicine is not universal, in that each program differs significantly. Partnering agencies, which include a variety of nonprofit groups, faith based organizations, state agencies, and private entities, play an important role in these programs. These resources will differ in each community. Each program must be tailored to the resources that are available in that location. The three agencies who participated in this pilot offer varied services, but do have some similarities, which can broadly be considered for statewide expansion.

All across North Carolina, and the United States, there are patients who rely on EMS and the Emergency Department to receive healthcare, often serving as the patients' primary care provider, when their healthcare needs could be more appropriately and effectively met in an alternative setting. The concept of high utilization reduction can be applied across the state, regardless of geography, demographics, and local resources. However, limitations will exist for each program and could differ amongst each program. Limitations include:

- Community resource options
- Staffing levels
- High-utilization definitions
- Reduction percentages
- Costs of operations
- Sample size

To begin the process of trying to calculate savings from high volume utilization statewide, it must be determined what constitutes "high utilization". There is no widely accepted national standard that defines this concept. In researching this topic, it was found that Centers for Medicare and Medicaid Services (CMS) and the Center for Medicaid and Children's Health Insurance Program (CHIP) Services (CMCS) has published an informational bulletin regarding the reduction in "super-utilizers". They identify frequent ED users as "individuals with 4 or more visits per year"¹. A recent article in the *Western Journal of Medicine* contained a study by physicians out of Rhode Island who reviewed frequent users of urban emergency medical services. They divided frequent users into four different sub-categories, beginning at four or more transports in single a year². A 2010 article in the *Annals of Emergency Medicine*³ stated that, "When defined as 4 or more ED visits per year, frequent users accounted for 4.5% to 8% of all ED patients. These patients contribute 21% to 28% of all ED visits". Many other similar examples can be noted, as can a variety of sources that use a much higher threshold. For

¹ Mann, Cindy. "Reducing Nonurgent Use of Emergency Departments and Improving Appropriate Care in Appropriate Settings." *CMS and CMCS Informational Bulletin*. January 16, 2014. Page 3.

² Norman, Chenelle, Michael Mello, and Bryan Choi. "Identifying Frequent Users of an Urban Emergency Medical Service Using Descriptive Statistics and Regression Analyses." *Western Journal of Emergency Medicine* 17.1 (2016): 39-45. Web.

³ Lacalle, Eduardo, and Elaine Rabin. "Frequent Users of Emergency Departments: The Myths, the Data, and the Policy Implications." *Annals of Emergency Medicine* 56.1 (2010): 42-48. Web.

purposes of this estimated cost savings, NCOEMS defines high utilizers as anyone who is transported by EMS four or more times in a year.

Data regarding EMS in North Carolina is collected and maintained by the EMS Performance Improvement Center (EMS PIC), within the Department of Emergency Medicine at the University of North Carolina at UNC Chapel Hill. The EMS PIC examined all patient care reports from 2015 and determined, by county, how many people met the criteria as high utilizers and how many times each of these individuals was transported to the ED by EMS. This provides the master list of high utilizers across North Carolina. A total of 17,763 patients met the stated definition of a high utilizer in NC for calendar year 2015. These patients accounted for a total of 141,176 EMS calls for service and were transported to the ED a total of 103,221 times (Figure 4.1)

High Utilizers in NC 2015

<i>Number of high utilizers</i>	17,763
<i>Total number of EMS calls</i>	141,176
<i>Total number of EMS transports</i>	103,221

Figure 4.1

Wake County EMS was able to provide NCOEMS with a list of 60 patients and the dates of when these patients were enrolled into a high utilizer Community Paramedicine program. The EMS PIC reviewed the EMS call volume as well as the number of EMS transports for each of these individuals both before and after the intervention of community paramedicine (at three month and 12 month intervals, Figure 4.2). These patients in the small cohort at Wake County EMS saw an average decrease in call volume of 35.4% within three months after intervention and 37.1% over a year. It also showed a 35.1% reduction in EMS transports after three months and a 38.8% reduction in EMS transports after one year. A recent report from the State of California shows a 52% reduction in 911 calls and a 37% reduction in ED transports⁴.

⁴ Coffman, Janet M., Cynthia Wides, Matthew Niedzwiecki, and Igor Geyn. *Evaluation of California's Community Paramedicine Pilot Project*. Report from Healthforce Center at UCSF, 23 Jan. 2017. Web.

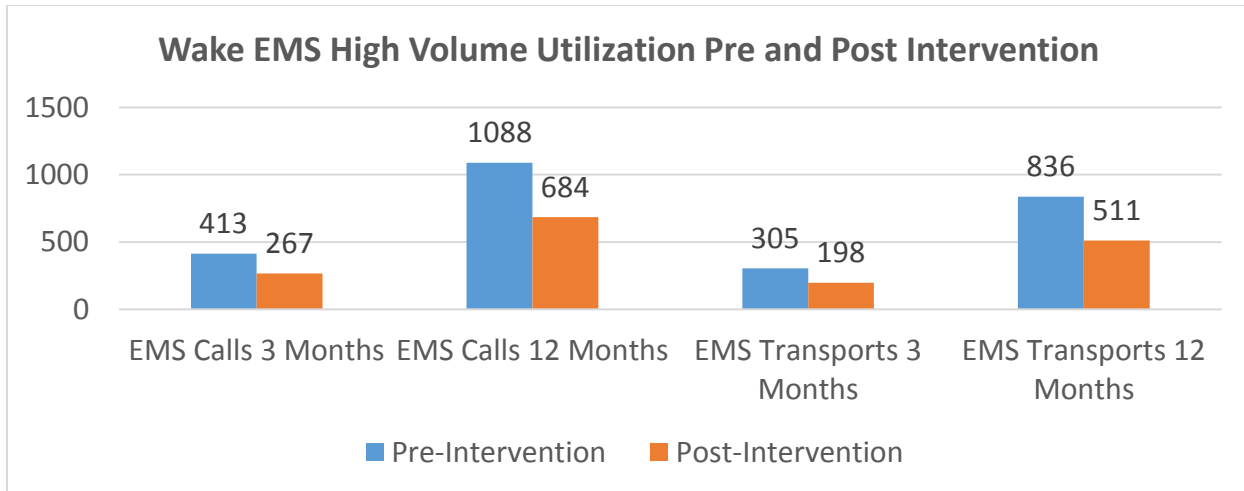


Figure 4.2

In addition to the information the EMS PIC compiled regarding high utilizers in Wake County, NCOEMS employed the data provided by NHRMC (Figure 2.6). Using the information from both counties, a range of potential call and transport reduction was calculated, then applied to every county in the State, using the high utilizer counts from the EMS PIC (Appendix 1). This translates into an estimated decrease, statewide, of 46,164 to 51,376 EMS calls and 28,798 to 40,049 EMS transports in a single year (Figure 4.3 and Figure 4.4). These calculations include the following assumptions:

- Every agency applied the same community paramedic program to every single patient who met the criteria of a high utilizer (4 or more calls in a calendar year)
- Similar frequency in both calls and transports for each county
- As sample size increases, percentages would remain the same. This limitation must be assumed until further research can be completed.

<i>Number of Calls</i>	<i>Min. % Change</i>	<i>Max % Change</i>	<i>Range</i>
141,176	32.7%	37.1%	46,164 – 52,376

Figure 4.3

<i>Number Transported</i>	<i>Min. % Change</i>	<i>Max % Change</i>	<i>Range</i>
103,221	27.9%	38.8%	28,798 – 40,049

Figure 4.4

The rate paid for EMS transportation must be calculated in order to estimate a potential monetary savings. This rate varies based on the level of service provided, distance traveled, and the payor source. For the purposes of this research, the North Carolina Division of Medical Assistance (DMA) provided NCOEMS with the average amount paid, per claim, per county in North Carolina (Appendix 2). This estimate, using the DMA payments for all patients, is much more conservative than what the actual amount would total, as Medicaid is a small percentage of the entire population. Using the information above regarding the estimated number of EMS transports reduced, a potential gross savings of between \$2,126,213 and \$2,956,885 in a single year is projected (Appendix 1).

To generalize possible State savings, NCOEMS assumes the high utilizer population has the same percentage of NC Medicaid recipients as the entire State. The US Census estimated the population of North Carolina to be 10,042,802 people as of July 1 2015⁵. The NC DMA 2015 annual report states that an average 1.8 million residents receive Medicaid benefits⁶. It is then estimated that approximately 17.9% of North Carolinians receive Medicaid benefits. Applying this percentage to the range of possible total savings in a single year (since the DMA cost estimate was used as the baseline for all payor sources), it is estimated that \$380,592 to \$529,282 State tax dollars could be saved by a Community Paramedic high utilizer program from transport costs alone.

A greater cost savings from a Community Paramedicine program would be seen in the reduction of ED utilization. Each transport that a Community Paramedic can avoid translates into one less Emergency Department bill. A 2013 study funded by the National Institute of Health, and published by the Public Library of Science, found that the median charge for the ten most common outpatient conditions in the emergency department was \$1233⁷. Using the number of estimated EMS transports that will be reduced (Figure 4.4), it is estimated that between \$35,507,934 and \$49,380,417 could be saved from ED charges in a single year.

DMA provided NCOEMS with the actual amount paid for three common ED outpatient diagnoses, for the three pilot counties used in this grant (McDowell, New Hanover, and Wake). These three (congestive heart failure, pneumonia, and diabetes) are just a small sample of what is seen in the emergency department. The average amount paid for those three diagnoses, in the three pilot counties is \$189.16 (Appendix 3). When this amount is applied to the estimated percentage of transports reduced that are also potentially Medicaid patients, the State gross savings is between \$975,089 and \$1,356,044 annually (Figure 4.5).

⁵ "Population Estimates, July 1, 2015, (V2015)." *North Carolina QuickFacts from the US Census Bureau*. Web. <http://www.census.gov/quickfacts/table/PST045215/37>

⁶ "North Carolina Medicaid and NC Health Choice, Annual Report for State Fiscal Year 2015" NC Department of Health and Human Services, Division of Medical Assistance. Web. https://ncdma.s3.amazonaws.com/s3fs-public/Medicaid_Annual-Report-State-Fiscal-Year-2015.pdf

⁷ Caldwell N, Srebotnjak T, Wang T, Hsia R (2013) "How Much Will I Get Charged for This?" Patient Charges for Top Ten Diagnoses in the Emergency Department. *PLOS ONE* 8(2): e55491. doi: 10.1371/journal.pone.0055491

<i>Transports Reduced</i>	<i>Estimated Transports Reduced on Medicaid (17.9%)</i>	<i>Average Paid for Medicaid ED</i>	<i>Totals</i>
28,798	5,154.84	\$189.16	\$975,089.53
40,049	7,168.77	\$189.16	\$1,356,044.53

Figure 4.5

To summarize the findings above, Figure 4.6 demonstrates the gross savings to both EMS and the ED, for both all payor sources and Medicaid only.

	<i>EMS All Pay</i>	<i>EMS Medicaid Only</i>	<i>ED All Pay</i>	<i>ED Medicaid Only</i>
<i>Minimum</i>	2,126,213	380,592	35,507,934	975,089
<i>Maximum</i>	2,956,885	529,282	49,380,417	1,356,044

Figure 4.6

The total potential gross savings, combining both EMS and ED charges (Figure 4.6) can be seen below in Figure 4.7.

	<i>EMS and ED All Pay Types</i>	<i>EMS and ED Medicaid Only</i>
<i>Minimum</i>	\$37,634,147	\$1,355,681
<i>Maximum</i>	\$52,337,302	\$1,885,326

Figure 4.7

The NCOEMS believes these estimates are very broad, make several assumptions that need further research, and lead to conservative estimates for potential savings. Until further data and the support of financial analysts are provided, this information is the best possible with the current resources.

In addition to the EMS transport savings and the ED outpatient savings, the costs of inpatient care should also be considered. This is an even larger number than any of the savings represented in this report, but again, more data and financial analysts are needed to make this calculation. Indirect and non-monetary savings must also be considered when looking at the entire picture of healthcare. Community Paramedicine improves patient satisfaction, saves patient and staff time, increases Paramedic employee satisfaction, and improves overall patient health.

It must be noted that in addition to the demonstrated funds saved above, high utilizers are only a percentage of what Community Paramedicine as a whole could save. All of these programs have multiple facets, of which only the high utilization program was used for potential cost and savings due to the inability to universally apply these unique programs across the state.

Statewide Expansion Costs

Aligning with the Institute for Healthcare Improvement’s Triple Aim philosophy, Community Paramedicine ensures that the patient is provided the right service, at the right time, all while doing so at a lower cost. Additional funding is needed to operate Community Paramedic programs across the State. There is an inherent challenge to predict funding requirements given that each program will vary across the State, to meet the needs of the community. Additionally, the uncertainty in the healthcare payment model that will be used going forward, makes the situation even more difficult, as the fee-for-service estimate presented below may not be the most cost effective.

This year, the Division of Mental Health, Developmental Disabilities, and Substance Abuse (DMH/DD/SA) services conducted a pilot program with EMS to assess using alternative destinations for behavioral and substance abuse patients. They established the following reimbursement rates:

- \$164.00 per patient encounter that was treated by EMS but not transported to an emergency department or alternative destination.
- \$211.00 per patient encounter that was transported to an alternative destination (other than an emergency department).

Using the reimbursement rate established by DMH/DD/SA and the estimated number of potential transports that could be avoided (see Figure 4.4 above), an estimated cost range for expansion of a Community Paramedic high utilizer program was determined (Figure 5.1). It should be noted that this estimate is thought to be very conservative, as the number of potential transports reduced could be much higher and the percentage of the Medicaid participants in this program may be much higher than 17.9%.

<i>Estimated Transports Reduced</i>	<i>All Pay Sources</i>	<i>Medicaid Only (17.9% of Total)</i>
<i>28,798 (Minimum Total)</i>	\$4,722,822	\$845,385.13
<i>40,049 (Maximum Total)</i>	\$6,568,036	\$1,175,678.44

Figure 5.1

These estimates only look at the reimbursement from a high utilizer Community Paramedic program. Other initiatives, such as alternative destinations and hospital re-admission reduction, should also be a reimbursable service rendered by EMS agencies. These types of programs are far less transferrable when trying to apply analysis across the state. Therefore, no estimates regarding potential costs of other program types could be reliably calculated without the data and assistance of a financial analyst or health economist.

Net Savings

When combining both the estimated costs and savings, there is a potential net savings:

- \$32,911,325 - \$45,769,266 for all payor sources (EMS and ED)
- \$510,295.87 - \$709,647.56 in NC Medicaid claims paid out (EMS and ED)

Statewide Expansion Timeline

All three pilot sites, the NCOEMS, and partnering agencies (such as NC Association of EMS Administrators, NC Association of EMS Educators, CCNC, NC Division of Mental Health/Developmental Disabilities/Substance Abuse Services, et al.) are in favor of expansion of Community Paramedic programs. In order to expand these services, programs must have more sustainability through an agreed upon reimbursement/payment model.

NCOEMS is also exploring partnerships with other agencies, such as Community Care of North Carolina which could provide EMS agencies funding to operate a Community Paramedic Program that focuses on the NC Medicaid population.

It is estimated that it would take the NCOEMS 18-24 months to have the necessary rules in place to effectively regulate and monitor Community Paramedic programs. This would allow the needed time to amend NC Administrative Code. Other items to be addressed include: educational requirements, data collection, procedures and processes, and transportation requirements. Stakeholders are actively involved in working the NCOEMS to make these changes in preparation for future reimbursement.

Summary

Below is a timeline of events that have occurred since the session law was approved.

<u>Task</u>	<u>Date</u>
Budget Certified (SL2015-241)	11/20/2015
Applications Released	12/01/2015
Applications Closed	12/30/2015
Recipients Announced	01/15/2016
Contracting Process Initiated	01/20/2016
HRSA Evaluation Tool Completed	04/01/2016
All Contracts Executed	04/12/2016
Interim Report Due	06/01/2016
Extension Approved (SL2016-94)	07/14/2016
Final Report Due	03/01/2017

Each pilot program recipient is continuing to collect data regarding their programs. As noted above, analysis of the data shows positive results. More information will need to be analyzed over a longer period of time to ensure that the data supports the claims of program efficiency over an extended period of time. None of the pilot sites or other EMS agencies should be held liable for the projections in the statewide expansion cost/savings section, as each county is only responsible for their own service and the data they demonstrated within their own service area.

EMS revenue is currently generated from reimbursement for transportation to the Emergency Departments. Community Paramedicine often seeks a way to avoid unnecessarily transporting patients to the Emergency Department. As a result, the operation of a Community Paramedic program is currently an expense to the EMS agency which also decreases its revenues. The current reimbursement/payment model for EMS must change in order to provide the right care for the patient, at the right time, at a lower cost.

Appendix 2
NCOEMS Community Paramedicine Pilot Program Report

Name	Code	Payment Hospital	Count	Avg Cost
Alamance County	1	\$1,156,916.60	13,230	\$87.45
Alexander County	2	\$258,612.78	4,769	\$54.23
Alleghany County	3	\$84,657.12	1,058	\$80.02
Anson County	4	\$385,427.00	4,838	\$79.67
Ashe County	5	\$219,587.29	2,441	\$89.96
Avery County	6	\$106,987.99	1,272	\$84.11
Beaufort County	7	\$1,238,268.37	18,489	\$66.97
Bertie County	8	\$1,572,776.01	22,457	\$70.04
Bladen County	9	\$885,571.76	14,447	\$61.30
Brunswick County	10	\$955,235.14	15,538	\$61.48
Buncombe County	11	\$1,401,524.05	25,247	\$55.51
Burke County	12	\$853,657.05	11,948	\$71.45
Cabarrus County	13	\$810,777.97	11,714	\$69.21
Caldwell County	14	\$613,458.57	8,926	\$68.73
Camden County	15	\$73,508.48	1,336	\$55.02
Carteret County	16	\$832,861.34	12,473	\$66.77
Caswell County	17	\$223,104.49	2,733	\$81.63
Catawba County	18	\$1,102,431.54	16,278	\$67.73
Chatham County	19	\$277,222.42	3,357	\$82.58
Cherokee County	20	\$569,874.93	4,464	\$127.66
Chowan County	21	\$357,794.50	5,748	\$62.25
Clay County	22	\$153,101.63	1,242	\$123.27
Cleveland County	23	\$1,122,833.85	17,181	\$65.35
Columbus County	24	\$1,523,474.40	28,171	\$54.08
Craven County	25	\$1,119,288.24	14,955	\$74.84
Cumberland County	26	\$3,600,591.13	46,363	\$77.66
Currituck County	27	\$190,988.72	2,290	\$83.40
Dare County	28	\$367,850.73	3,562	\$103.27
Davidson County	29	\$1,275,112.70	18,320	\$69.60
Davie County	30	\$277,834.43	3,961	\$70.14
Duplin County	31	\$1,141,316.83	17,292	\$66.00
Durham County	32	\$1,334,145.77	21,883	\$60.97
Edgecombe County	33	\$6,286,946.11	66,971	\$93.88
Forsyth County	34	\$3,540,200.56	50,549	\$70.04
Franklin County	35	\$659,550.62	10,579	\$62.35
Gaston County	36	\$2,136,370.10	28,991	\$73.69
Gates County	37	\$221,824.52	2,475	\$89.63
Graham County	38	\$276,592.52	2,978	\$92.88
Granville County	39	\$464,256.20	6,327	\$73.38
Greene County	40	\$458,960.44	9,961	\$46.08
Guilford County	41	\$17,182,649.66	140,297	\$122.47

Name	Code	Payment Hospital	Count	Avg Cost
Halifax County	42	\$2,860,829.68	41,282	\$69.30
Harnett County	43	\$1,418,764.91	19,346	\$73.34
Haywood County	44	\$582,632.28	9,754	\$59.73
Henderson County	45	\$538,146.52	9,085	\$59.23
Hertford County	46	\$1,385,215.86	22,313	\$62.08
Hoke County	47	\$629,272.80	7,038	\$89.41
Hyde County	48	\$217,198.39	2,855	\$76.08
Iredell County	49	\$968,000.27	14,824	\$65.30
Jackson County	50	\$292,323.45	3,806	\$76.81
Johnston County	51	\$1,803,021.69	31,235	\$57.72
Jones County	52	\$150,956.06	2,982	\$50.62
Lee County	53	\$496,287.05	6,109	\$81.24
Lenoir County	54	\$1,254,398.22	20,470	\$61.28
Lincoln County	55	\$633,329.81	8,844	\$71.61
Macon County	56	\$243,770.53	2,993	\$81.45
Madison County	57	\$201,024.59	3,228	\$62.28
Martin County	58	\$1,077,398.52	19,731	\$54.60
McDowell County	59	\$535,743.73	7,102	\$75.44
Mecklenburg County	60	\$7,036,578.37	84,136	\$83.63
Mitchell County	61	\$137,960.25	1,855	\$74.37
Montgomery County	62	\$428,651.22	4,164	\$102.94
Moore County	63	\$631,225.12	9,171	\$68.83
Nash County	64	\$3,421,949.75	35,204	\$97.20
New Hanover County	65	\$1,400,461.26	17,220	\$81.33
Northampton County	66	\$1,357,579.63	23,490	\$57.79
Onslow County	67	\$1,494,689.52	18,558	\$80.54
Orange County	68	\$468,993.68	7,346	\$63.84
Pamlico County	69	\$139,844.90	2,173	\$64.36
Pasquotank County	70	\$567,564.12	9,680	\$58.63
Pender County	71	\$622,406.65	9,493	\$65.56
Perquimans County	72	\$267,458.31	3,323	\$80.49
Person County	73	\$357,240.21	4,896	\$72.97
Pitt County	74	\$2,520,482.48	53,993	\$46.68
Polk County	75	\$75,873.14	1,264	\$60.03
Randolph County	76	\$2,169,588.10	19,960	\$108.70
Richmond County	77	\$827,978.72	8,122	\$101.94
Robeson County	78	\$3,787,109.14	56,050	\$67.57
Rockingham County	79	\$1,117,679.14	16,319	\$68.49
Rowan County	80	\$999,159.72	14,907	\$67.03
Rutherford County	81	\$797,794.23	13,391	\$59.58
Sampson County	82	\$1,218,280.59	16,693	\$72.98
Scotland County	83	\$667,819.44	8,939	\$74.71
Stanly County	84	\$451,947.09	6,379	\$70.85
Stokes County	85	\$392,766.06	5,375	\$73.07

Name	Code	Payment Hospital	Count	Avg Cost
Surry County	86	\$732,988.33	12,023	\$60.97
Swain County	87	\$308,084.67	3,528	\$87.33
Transylvania County	88	\$278,087.71	3,378	\$82.32
Tyrrell County	89	\$191,909.19	2,566	\$74.79
Union County	90	\$787,515.59	11,284	\$69.79
Vance County	91	\$844,965.42	11,952	\$70.70
Wake County	92	\$3,814,877.78	59,181	\$64.46
Warren County	93	\$346,939.01	5,460	\$63.54
Washington County	94	\$632,865.47	8,004	\$79.07
Watauga County	95	\$195,254.30	2,143	\$91.11
Wayne County	96	\$1,815,963.67	33,147	\$54.79
Wilkes County	97	\$663,314.84	11,127	\$59.61
Wilson County	98	\$2,267,541.50	32,968	\$68.78
Yadkin County	99	\$289,711.23	4,814	\$60.18
Yancey County	100	\$198,390.55	3,032	\$65.43
ALL NC COUNTIES		\$119,329,949.02	1,586,816	\$75.20