

A. Executive Summary-The Heartland Rural Health Network, Inc. (HRHN) proposed to address the problem of higher rates of diabetes and cardiovascular diseases (CVD) in relation to unmanaged or poorly managed diseases in rural residents as compared to state and national rates, particularly within the African American, Hispanic, and elderly populations within the service area. Despite increased understanding of these diseases, patient outcomes have not shown a parallel improvement. For example, only 30 to 45% of patients with diabetes achieve one or more of the American Diabetes Association goals for the quality indicators of hemoglobin A1C, low density lipoprotein cholesterol (LDL), and blood pressure (BP) and only 7% of patients achieve goal levels in all three indicators at any given time.

To help address this issue, HRHN received a Health Resources and Services Administration (HRSA) Rural Health Network Development Grant, and was able to develop a network of eight local primary care provider offices in rural Highlands, Hardee, and DeSoto Counties, FL who participated in the Diabetes Master Clinician Program, Inc. Diabetes Master Clinician Program (DMCP). Through this grant HRHN was also able to incorporate a Community Health Worker (CHW) program within the DMCP. CHWs work closely with patients in a community based setting to address barriers to treatment and provide monthly progress reports back to the participating providers. HRSA's Rural Health Outreach Grant provided HRHN with an opportunity to: a) have adequate capacity to significantly expand their program's geographical service area of the DMCP and CHWs to include the rural portions of Polk County, Florida in addition to increasing the scope of services of the DMCP involving two additional key components: b) remote monitoring utilizing a remote monitoring system and c) incorporating the National Council on Aging (NCOA) Healthy Eating for Successful Living in Older Adults, an evidence based nutritional program. The geographical and service expansion further enhanced the outreach and chronic care management delivery in these rural communities. According to literature reviews, the remote monitoring system and CHW components were considered promising practice models supported by preliminary evidence showing effectiveness in small scale interventions while the NCOA's nutrition program and DMCP were both deemed evidence based through rigorous evaluations supporting measurable outcomes. The DMCP's internet based registry and remote monitoring system also generates data that can be useful for replicating results to diverse populations and settings. The only modification to the models was to the Healthy Eating program's target population. The program was designed and tested on adults age 60 and older and we are proposing to modify this to reflect adults 40 years and older, based on our target populations' age range.

The goal of the DMCP and its subservices was to empower and support low-income, uninsured/underinsured, high risk, chronically ill individuals and their families by fostering the requisite skills and behaviors to manage diabetes and CVD. To achieve this goal HRHN used a complementary set of strategies to include: 1) appropriate health resource utilization, 2) adoption of healthy behaviors, 3) an innovative, electronic chronic disease management system that supports both providers and patients and 4) addressing long term sustainability/viability.

B. Background & Purpose:

- i. **Outreach Grant Project Background-** HRHN targeted Highlands, Hardee, and DeSoto Counties as well as the rural portions of Polk County to include the towns of Frostproof and Ft. Meade, (service area) which are all designated rural by the State of Florida. These counties have a widely dispersed population due to their rural landscape. Additionally, all

four counties are identified as being socio-economically disadvantaged counties due to various factors including, but not limited to, per capita income, poverty rates, uninsured rates, and non-graduate high school rates. Based on a complete needs assessment, the target population of the program included low-income, uninsured/underinsured individuals with particular emphasis on seniors and minority populations. The service area is located in the southern part of Florida—about two hours southwest of Orlando and southeast of Tampa. Demographic, social, and economic conditions all influence chronic disease management in the communities as they have a direct relation to chronic disease outcomes. Of particular concern as it relates to chronic disease management within each of these counties is higher age adjusted death rates (AADR) and hospitalization rates that directly influence or impact patients with diabetes and cardiovascular diseases as compared to state of Florida rates. According to the National Institutes of Health, about 65% of people with diabetes die from heart disease and stroke. High blood glucose increases the risk for heart attack, angina, stroke, and coronary artery disease. Additionally, obesity, lack of adequate nutrition and regular exercise are all contributing factors to the prevalence of diabetes and CVD. These conditions within the service area are exacerbated by the lower socio-economic status as compared to state and national data with over 40% of adults and 29% of adults being classified as overweight and obese, respectively. A 2011 Trust for America’s Health Report by the Robert Wood Johnson Foundation concluded that more than 33% of adults who earn less than \$15,000 a year were obese compared to 24.6% of adults earning at least \$50,000 annually. Furthermore, nearly 33% of adults who did not graduate high school are obese compared to 21.5% of adults who graduated from college or technical college. High levels of preventable chronic conditions indicated a need for improved access to prevention programs and access to health care services within HRHN’s service area.

The project rationale that magnified the need for federal assistance locally was attributed to:

- Disparities in the AADR and hospitalization rates of diabetes;
- Higher rates of seniors and minority populations experiencing higher rates of diabetes & CVD;
- Higher rates compared to state and national rates of conditions impacting diabetes and CVD outcomes such as stroke, blood pressure, obesity, etc.;
- Impact of socio-economic factors on chronic diseases; and
- Difficulty navigating available services for the target population.

ii. Purpose of Evaluation-To evaluate outcomes of the DMCP and subservices program. Our proposed program hypotheses was that community based chronic disease management services incorporated into primary health care delivery systems would enable patients with chronic diseases to improve their ability to manage their disease(s). The core components of the DMCP and sub-services would change how chronic diseases were managed with long term positive outcomes.

iii. Brief Description of Outreach Grant Project- Evidence Based/Promising Practice Model. There are four main components of our outreach program which were developed to adequately address chronic disease management within our service area and target population. Two models are based on promising practice models and two have been determined to be evidence based. They are each discussed in greater detail below.

Component 1) Diabetes Master Clinician Program (DMCP): The Diabetes Master Clinician Program, Inc. evidence based DMCP model represents a necessary shift in medical practice. An article published in *Clinical Diabetes* (2008) reported that the 58 Florida practices participating in the DMCP at the time of publication were able to help patients attain better control of their diabetes as compared to the national averages. The journal article stated that, “the 8,657 patients (27,920 visits) in the 58 practices averaged 54% goal achievement for A1C, 53% goal achievement for LDL, and 54% goal achievement for blood pressure and 19% are achieving all three goals at the same time. Several practices across the state have achieved goals as high as 75% for the individual measures and 44% for all three measures together.”¹ This evidence based model was selected due to the successful outcomes reported in the *Clinical Diabetes* journal article as well as numerous discussions with Dr. Edward Shahady, the DMCP’s Medical Director, on the core content and quality indicators offered by the DMCP’s registry that would help improve the quality and systems of care at a more local level impacting both provider and patients. No modifications were made to the evidence based program to expand services into these new communities.

Indicators used to develop the registry’s database fields were obtained from several sources including ADA, National Cholesterol Education Project, the Joint National Committee on Prevention, Detection, Evaluation, & Treatment of High Blood Pressure. After clinicians and staff completed one year of training and have demonstrated an increase of 10% (over base line) in the number of patients who have achieved goal for HbA1c, LDL and BP the office was considered a Center of Excellence in Diabetes Care. Additionally, if the office achieved three other yearly goals, the clinician and nurse/MA were declared master clinicians and master clinician associates, respectively, by the DMCP, Inc.

Component 2) Community Health Workers (CHWs): HRHN utilized the promising practice model of CHWs to aid in chronic disease education in the home/community based setting for the target population. An evaluative research report conducted by RTI International- University of North Carolina Evidence-based Practice Center and published by the Agency for HealthCare Research & Quality (AHRQ) concluded that CHWs can serve as a means of improving outcomes for underserved populations for some health conditions and that the effectiveness of CHWs requires further research that addresses methodological limitations of prior studies. CHWs serve as a connection between health care consumers and providers to promote health among populations or groups that have traditionally lacked access to adequate health services. The National Community Health Advisor Study conducted by the University of Arizona and the Annie E. Casey Foundation (1998) surveyed 500 CHWs nationwide and identified the seven core services including bridging cultural mediation between communities and the health care system; providing culturally appropriate and accessible health education and information, assuring that people get the services they need; providing informal counseling and social support; advocating; health screenings; and building individual and community capacity. The Centers for Disease Control (CDC) has provided leadership in documenting and acknowledging the roles of CHWs with the first national database established in 1993. Particular emphasis was made to engage the higher risk patients who were having more difficulty controlling their chronic disease(s). The CHW’s educational tools encouraged thought provoking conversation that has been shown to improve patient engagement and optimize chronic disease management outcomes. All educational

¹ Shahady, E. (2008). The Florida Diabetes Master Clinician Program: Facilitating Increased Quality and Significant Cost Savings for Diabetic Patients. *Clinical Diabetes*, 26(1), 29-33. <http://clinical.diabetesjournals.org/content/26/1/29.full.pdf>

materials were available in both English and Spanish and were culturally sensitive. CHWs met with patients in their home or comfortable setting. CHWs reviewed patient report cards and kept detailed notes to monitor patient progress. Patients stayed in the program until they were comfortable enough with the tools to manage their chronic condition on their own—typically six months. Practitioners received updates on their referred patients through case management meetings whereby the CHWs review progress and areas of concern with the medical office.

Component 3) Healthy Eating for Successful Living in Older Adults : This program is one of the four original Model Programs Projects, evidence-based health promotion programs in nutrition, physical activity, depression and chronic disease self-management, that were developed, tested, and disseminated by the National Council on Aging (NCOA). The focus of this program was to maintain or improve participants' wellness, with particular emphasis on chronic diseases development/progression. Entitled CHOICES (Choosing Health Over Illness with Creative Eating Solutions), the program used behavior change strategies that help participants build a sense of empowerment as they accomplish incremental changes through various activities and lessons. The Healthy Eating program was developed by the Lahey Clinic in collaboration with several other Boston area organizations and the NCOA. Pilot testing was conducted at three agencies in Boston which differed in size, location, and diversity of the population served. The Healthy Eating program was conducted by two lay leaders, which are also CHWs. Education was incorporated into the program through group interactions. This program also included components of physical activity, nutritional practices, setting goals, and addressing problems that are used in a process to live healthier.

Component 4) Remote Monitoring: Remote monitoring, one of three types of telemedicine applications, enables medical professionals to monitor a patient remotely using various technological devices. This method is primarily used for managing chronic diseases or specific conditions, such as heart disease, diabetes mellitus, or asthma. These services can provide comparable health outcomes to traditional in-person patient encounters, supply greater satisfaction to patients, and may be cost-effective. Remote monitoring is considered a promising practice and not evidence based due to several factors including lack of randomized controlled trials and lack of cost effectiveness analysis. A 2008 report published by Health Management Associates detailed some promising findings in their evaluation of remote monitoring in chronic disease management. Researchers found that interventions to manage congestive heart failure, conditions among the elderly, and high risk pregnancy provide the most benefit for improved outcomes and cost savings. Research consistently reflected a strong return on investment for care management (ranging from \$2.72 to \$42.7 dollars saved per dollar invested). This can be attributed to higher costs and severity of illness lending itself to savings potential by reducing hospital readmissions. The original expectation was that 15 candidates would be randomly selected to be part of a control group that just received CHW services and 15 candidates would receive CHW services in conjunction with using remote monitoring equipment. Due to multiple barriers including insurance, company contracts, issues with vendors and other variables, this program never got off the ground.

iv. Baseline Data- PIMS Measures.

1) *Access to Care:* 4 of counties served, 0 people in target population, 0-unduplicated encounters, 0-of indirect encounters, 0-of direct duplicated encounters

2) *Population Demographics*: 0- people served by ethnicity, 0- people served by race, 0- people served by age group

4) *Staffing*: 0- new clinical staff recruited to work on the program by type, 0- new non-clinical staff recruited to work on the program by type, 0- staff positions shared between two or more Network partners I don't have this information.

5) *Sustainability*: Annual program revenue, additional funding secured, estimated amount of cost savings due to participation in consortium

7) *Quality Improvement*: 4- QI guidelines adopted by consortium, 4 using shared standardized QI benchmarks

8) *Health Promotion/Disease Management*: 0- people participated in health promotion/disease management activities through this program

9) *Clinical Measures (Measures 1, 3, 4, 6)*: 0-BP Less than 140/90 mm HG within last 12 months, 0- patients 18-75 who meet recent hemoglobin A1c level during the year less than 8.0%, 0-patients 18-75 with diabetes who had blood pressure less than 140/90 mm/Hg,

Additional Non PIMS Measures.

a) 0-diabetes registry patients reach goals for all 3 indicators by Yr 3, **c)** 0-patients achieving 1+ of ADA goals for BP, LDL, A1c and patients achieving all 3 ADA goals, **d)** 0-LDL <100mm/DL, **3)** 0- and types of dissemination of data, **f)** 75% Program completion rate of Nutritional Education Program

C. Evaluation Methods

i. Data Collection Methods

Although multiple data collection methods were used, the majority of data collected in this project was quantitative. The project retrieved the relevant medical data as identified in the project objectives from the DCMP registry. This data was also used to calculate each clinic's estimated savings. Additionally, the PD tracked and maintained records of CHW case load and case conferences between HRHN staff (PD and CHWs) and participating providers. Primary data collection included program satisfaction surveys to CHW program participants upon their exit or completion of the program. CHWs tracked participants in the Healthy Eating Programs through sign-in sheets. Sheets were given to the PD who reported number of participants and the completion rate of participants in each program..

ii. Data Sources

Data sources for the project included: DCMP registry medical record data, CHWs, participating program clinics, Healthy Program sign-in sheets, CHW patient exit satisfaction surveys, CHW Program Referrals and HRHN records.

iii. Description of participants/samplings

All CHW program participants were diagnosed with diabetes or pre-diabetes and entered into the DCMP registry. Participants in the CHW program were those in the DMCP registry identified as

high-risk or high-need patients who would benefit from one-on-one attention by clinic providers. Any patient at a participating clinic who is entered into the registry can participate in the CHW program. Referrals to the CHW program require the patient's most recent lab results in their report card so high-risk referrals can be distinguished.

Healthy Eating Program participants self-selected into the program, although our providers did promote the program to patients they felt would benefit from the program. Efforts were made to outreach to the target communities and to hold programs at naturally occurring gathering spots for the population. Outreach included participation in health fairs, promotion of the program during community meetings, dissemination of program information through providers and partner agencies. A survey with demographics and program feedback was provided to participants although the majority did not complete or return the survey.

iv. Data Process

Limited analysis occurred with this project beyond a basic review of participant percentages related to key objectives. The objectives where data analysis occurred included: Objectives 1, 3, 4,6,7, and 8. The DMCP registry allows us to pull down all patients entered into it by clinic. Participant percentages were determined for each clinic by calculating averages for each clinic based on the data in the registry for that clinic. When asking for overall percentages, all patients from all clinics were combined into the same data set and then averages were run, so each patient has equal weighting in data from all clinics. Percent changes were identified using the standard percent change formula.

v. Data Limitations

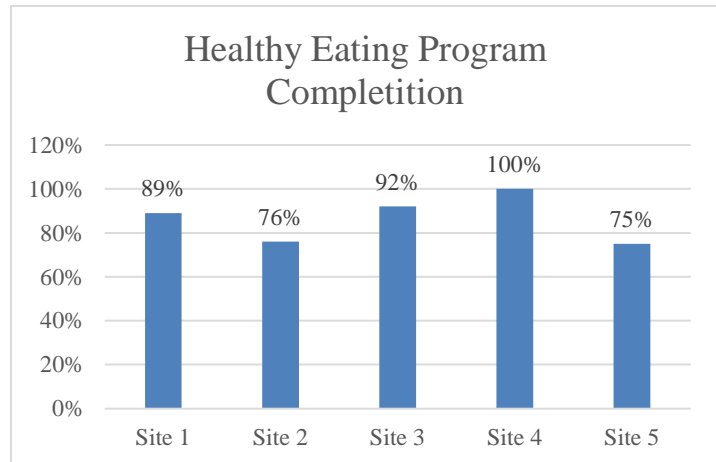
During the grant period, we had three different program directors. This instability caused holes in the data collection and reporting process. Therefore, the evaluation process of this program was hindered by a lack of data collection for the first half of the grant period. Baseline data for the program was adjusted to the start date of consistent data collection. Accessing data in DCMP registry was challenging due to the inability to retrieve archival data. The self-selection nature of the program also restricted response rates to program surveys. Clinic 80 dropped out during the last of year of the grant period due to closing its doors. The number of participating clinics was reduced from seven to three during the grant period therefore a limited amount of participant data was collected. No participants from two of the clinics participated in the CHW survey which limited the ability to draw any conclusions for the project as a whole.

D. Results Discussion

The following information details the results of each objective. Clinic 80 withdrew from the project in November of 2014. The individual clinic data is included in the information below but is not included in the data for participating clinics. Consistent data collection did not begin until September, 2013 and for the purposes of quarterly evaluation, not able to be entered until grant year 2, quarter 3 (Nov. 2013 – Jan. 2014). The lack of data during the first half of the program prevented a further detailed analysis of the program. For the purposes of the below results grant year 2, quarter 3 was used as a baseline since the initial data was unavailable.

Objective 1: Conduct 5 Healthy Eating programs with at least 75% completing program.

All Health Eating Program courses by HRHN reached the objective of 75% completing the program with one course having 100% completion. In addition to the program, nutrition packets were distributed throughout the community and materials were distributed at community events and health fairs including 912 pieces of material. HRHN provided services to 1,002 people through their nutrition efforts and outreach. Specific nutrition programs were conducted at 10 locations with a total of 99 participants.



Objective 2: Infopia Remote Monitoring System in 15 homes (yr 1), 15 homes (yr 2), 20 homes (yr3) of individuals also receiving CHW services and comparing to an additional 15 individuals receiving just CHW services to determine if there are differences in achievement of health goals.

Due to multiple barriers HRHN was unable to implement the activities necessary to reach this objective. When originally drafting the Year 1 budget, we worked closely with a manufacturer of remote monitoring equipment. We were surprised to see some unexpected costs that were not originally disclosed to us when drafting the budget. Also, the Network administration was not satisfied with the contract terms and conditions. The Network administration wanted language to be included to state “based on availability of grant funds” for subsequent contract years, but this was not included in the amended contract language. The additional costs were also not to the Network’s benefit or budget, so we started seeking additional vendor quotes for similar remote monitoring systems. In comparing three additional vendors the Network opted to go with another vendor. This company was the most agreeable and easy to work with to modify the terms and conditions to include exactly what we wanted in the contract to protect our interests as it relates to the grant agreement we had with HRSA. Furthermore, their costs were half of what we originally budgeted for the 15 units and they were willing to visit the Network office to complete “hands on” training with the staff to roll out the systems. The units were ordered and training on the system occurred in December, 2012. Staff met with the Diabetes Master Clinician providers to ask them to select a sample of patients who were seeing a CHW and may also have been willing to participate in the remote monitoring project. One caveat was that due to reimbursement of the diabetes test strips and a certain strip being required for the remote monitoring product, we had to select patients based on having Medicare. This ultimately squashed hopes of getting this program off the ground. In Year 3, we had a client who was referred to us, but after meeting with him he wasn’t interested in participating. The provider even tried to speak with him to encourage participation, but this did not come to fruition.

Objective 3: CHWs case manage at least 40 patients/month referred by DMCP providers and meet at least quarterly to review individual cases with practitioners.

HRHN maintained two consistent CHWs during the available reporting period. A number of cases were closed during the last quarter of grant year three which contributed to the reduction in patients managed. One CHW maintained the targeted patient load during the available data period.

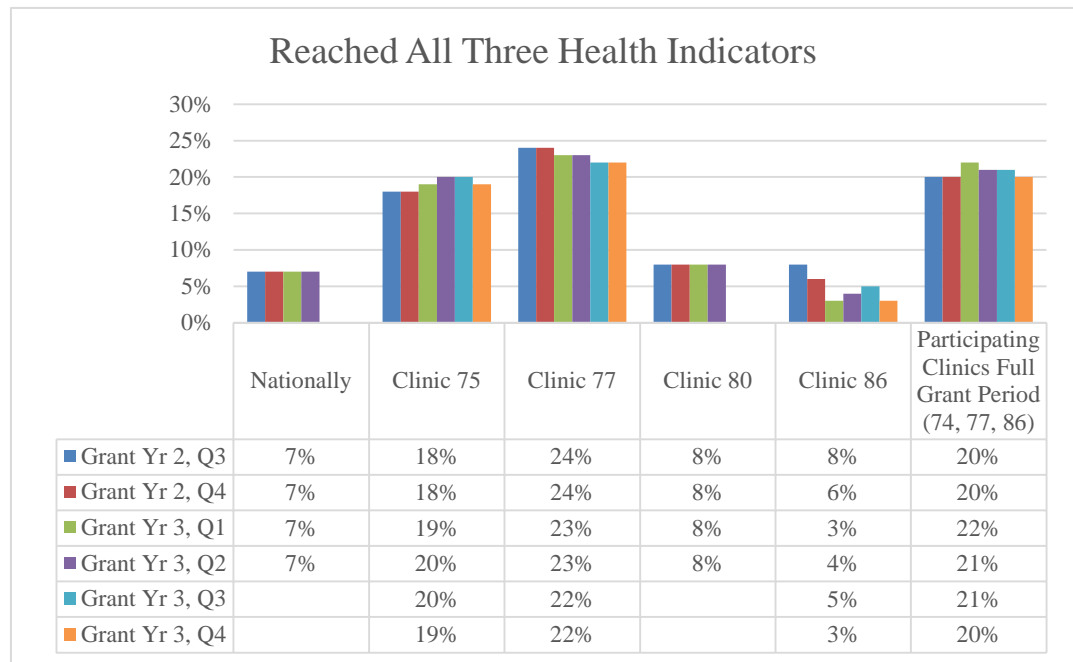
CHW Patients Managed				
	Tamara	Karen	Idalmy	TOTAL
March 2014	86	69	0	155
April 2014	55	48	22	125
May 2014	57	56	22	135
Jun 2014	51	41	31	123
July 2014	69	58	0	127
Aug 2014	69	58	0	127
September 2014	69	51	0	120
October 2014	64	44	0	108
November 2014	67	46	0	113
December 2014	64	45	0	109
January 2015	49	44	0	93
February 2015	47	46	0	93
March 2015	43	33	0	76
April 2015	44	29	0	73
AVERAGE	60	48	25	113

HRHN met multiple times quarterly with Clinics 77 and 86. HRHN met with Clinics 75 and 80 each once. There was a period of time with only two CHWs providing services in the program which reduced the total number of meetings.

HRHN Meetings with CHWs					
	Clinic 75	Clinic 77	Clinic 80	Clinic 86	Participating Clinics
Grant Yr 2, Q2		3		3	6
Grant Yr 2, Q3		2		3	5
Grant Yr 2, Q4		2	1	2	5
Grant Yr 3, Q1	2	2		2	6
Grant Yr 3, Q2		2		3	5
Grant Yr 3, Q3		2		3	5
Grant Yr 3, Q4		2		2	4

Objective 4: 15% diabetes registry patients will reach goals for all 3 indicators by Year 3 of program compared to 7% reaching goals nationwide.

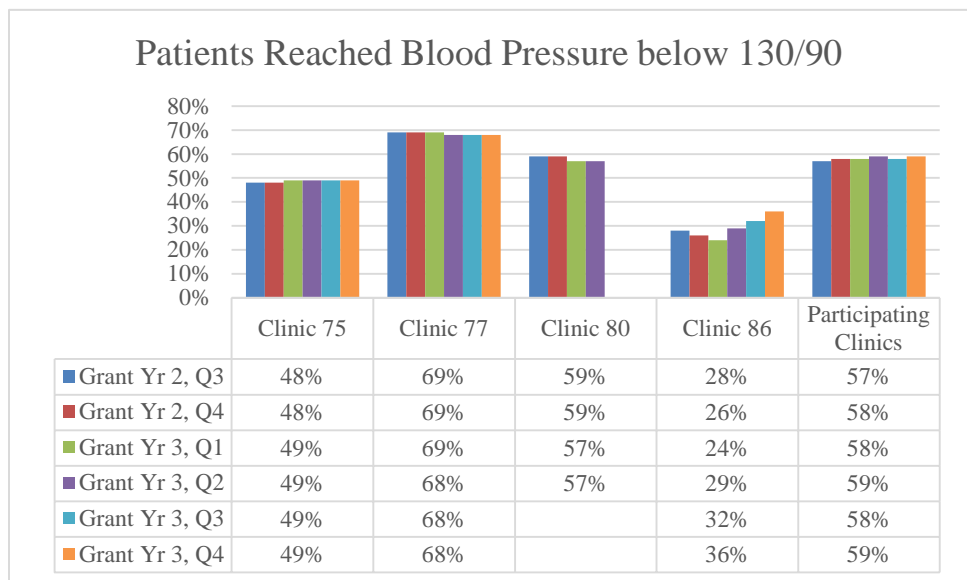
Twenty percent of participants from the three program clinics combined reached all three indicators by Year 3 of the program. Clinic 75 had 19% reach all three indicators and clinic 77 had 22% reach all three indicators. Clinic 86 was at 8% at the start of data collection and has decreased to 3% reaching all three indicators.



Objective 5:

Continue DMCP in 7 current locations while expanding into an additional 2 locations with emphasis in Ft. Meade and Frostproof (Polk County).

Unfortunately HRHN was unable to expand the program to two additional communities. We were able to meet with several additional practices to discuss the potential for partnership but were unable to get other providers on board. Most providers reported that the main barriers to their participation in the program were limited staff, and DMCP registry not being able to communicate with EHRs which would cause 'double' data entry for staff

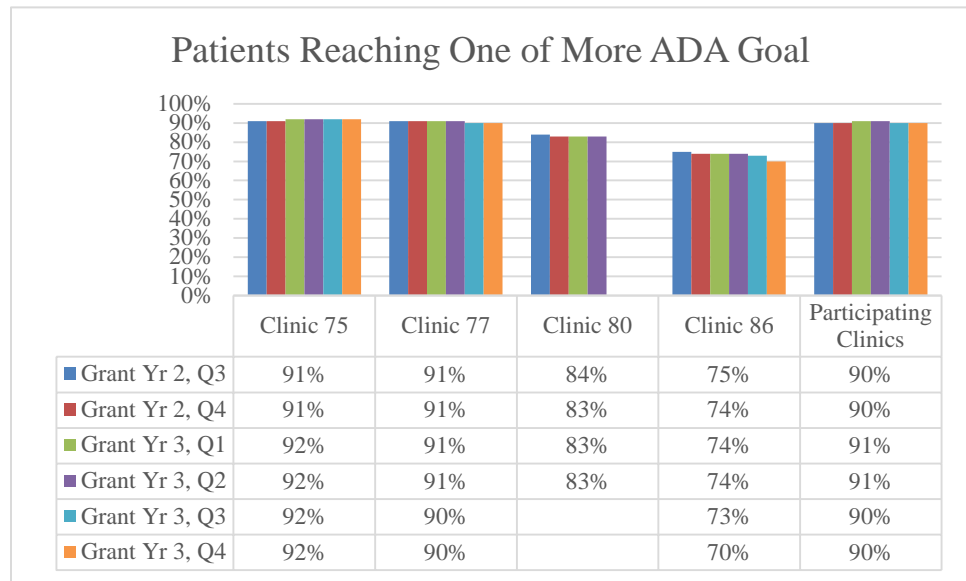


Objective 6: Greater than 40% patients w/diabetes/CVD have BP <130/90mm/HG by end of Year 3.

When grouping participating clinics the program met the objective of 40% of patients reaching blood pressures below 130/90. Both clinics 75 and 77 maintained their average above the target blood pressure. Clinic 86 increased the percentage of patients with blood pressure meeting the objective but failed to reach 40%.

Objective 7: 55% registry patients will achieve 1 or more of ADA goals.

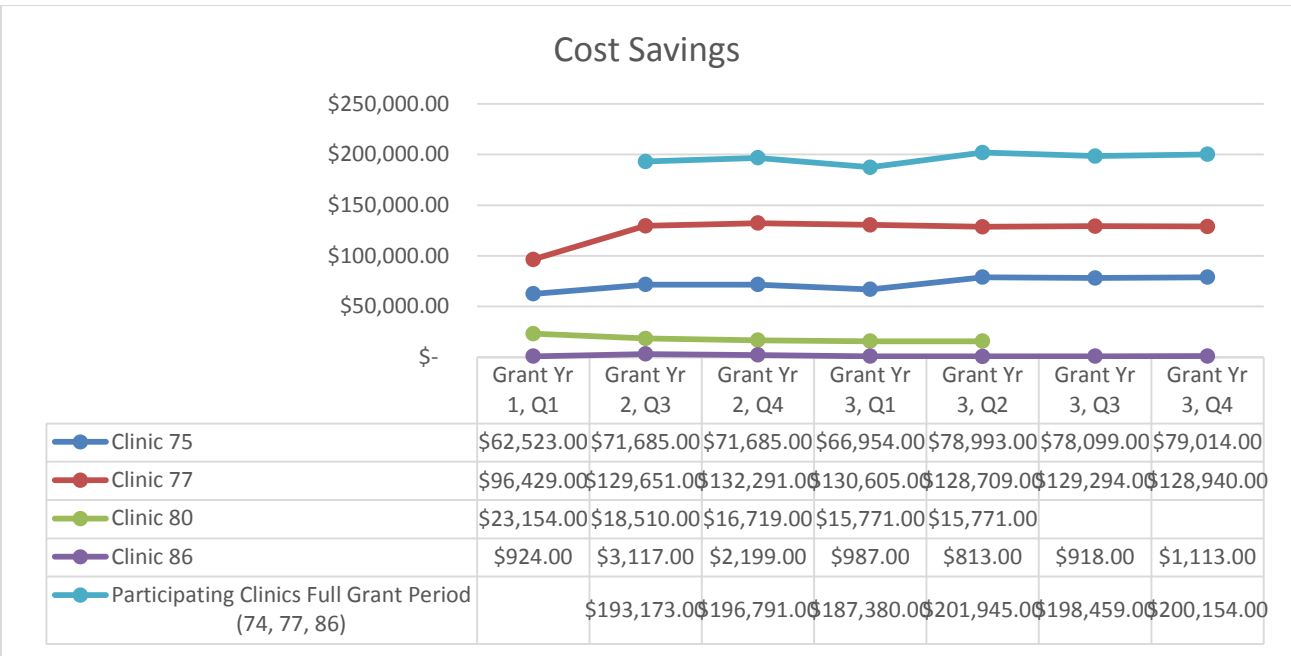
All clinics surpassed the goal of 55% of registry patients achieved one or more ADA goals. Clinic 75 had 92% of patients reaching the objective at the end of the project. Combined results had 90% of patients reaching the objective.



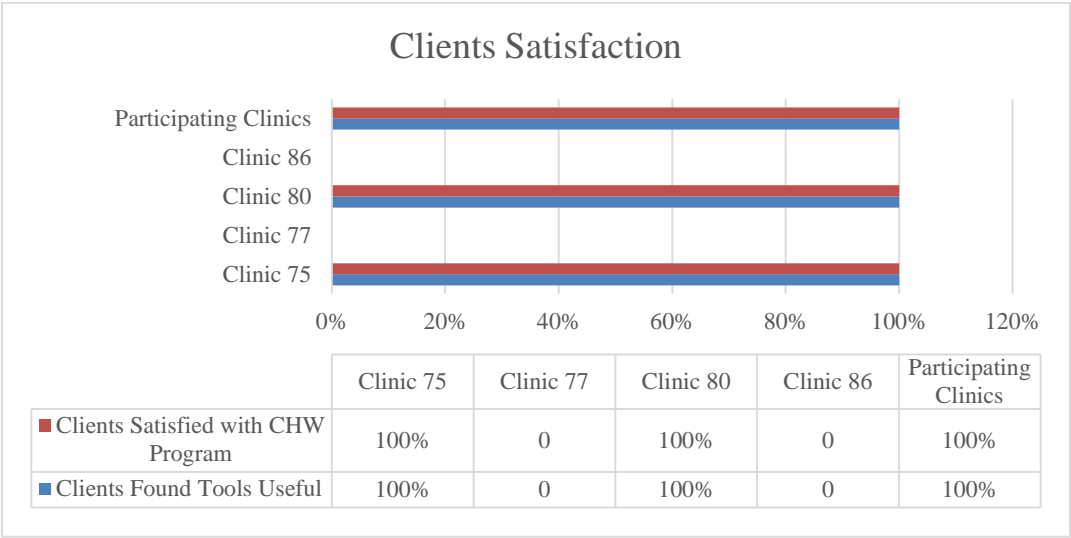
Objective 8: Secure at least two additional revenue streams to support activities after grant funding ends and retain 90% consortium members report being highly satisfied/satisfied with communication w/in the consortium.

We were able to secure one additional revenue stream to support activities after funding ends. We maintained 100% of consortium members being highly satisfied/satisfied with communication within the consortium. All clinics participating during the full grant program increased their savings from the first quarter of the grant period. Clinic demonstrated a 33.7% increase in cost savings from the beginning of the grant to the end of the grant period.

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Of clinics participating in the client satisfaction survey 100% were satisfied with the CHW program and 100% found the program tools useful. Clinics 77 and 86 did not provide survey data.



Objective 9: Disseminate evaluation results to at least 2 sources at a local, statewide, and/or national level.

We will disseminate our evaluation results on our website and a published article through the Florida Rural Health Association and in a report to the State Office of Rural Health.

iii. Key Lessons Learned

Community commitment is critical to the success of the program. We utilized face to face meetings to keep providers ‘up to speed’ on their data and any barriers we could help them

address with DMCP data entry. CHWs are relevant to community based case management services, but it's critical to have a structured referral system whereby they have the ability to easily track clients, document time and travel, and report back to the provider offices. We developed a policy and procedure manual specific to this program to incorporate these aspects to make it a more effective and functioning program. Having a registry that can be tied into a variety of EMRs is critical to program sustainability and longevity.

E. Dissemination of project findings

i. Accessing Reports

The evaluation report can be accessed via our website under Current Initiatives. It is also available by emailing support@hrhn.org

ii. Other Dissemination Strategies

We will share with the State Office of Rural Health and compose a news article for the Florida Rural Health Association's newsletter.

F. Conclusions & Recommendations

The overall program components were successful, with the exception of the noted Remote Monitoring Program. We recommend the DMCP registry, if a provider is willing to accept that the registry does not interact with other EMRs so it may cause double data entry. The reports are valuable to the providers who do participate. We also recommend the CHWs as they helped individuals improve their A1C, LDL, and BP, as evidenced by the data above. Lastly, we would recommend the Healthy Living Program as part of a comprehensive healthy lifestyle program.