Duke University Medical Center: The Durham Diabetes Coalition

PROJECT OVERVIEW

Duke University, in partnership with Durham County Department of Public Health, the University of Michigan, and Durham County community partners built an integrated team known as the Durham Diabetes Coalition (DDC). The DDC is committed to improving population-level health outcomes and quality of life for adults suffering from type 2 diabetes and at the same time sought to reduce disparities (e.g., race, age, gender, SES, and insurance status) in health outcomes. Through a specially enabled informatics system, visual maps revealed disproportion in the prevalence of diabetes among Durham County residents. Through this innovative system, patients of high need were identified and interventions were then developed and implemented to meet the specific needs of patients. Using data from Duke University Health System, 14,345 unique patients were identified. A risk algorithm was used to distribute patients into low, moderate, or high-risk groups and guide the appropriate interventions in combination with recommendations from providers. During the Together on Diabetes project period, the informatics system allowed for real-time monitoring of individuals and populations with type diabetes, allowing for data-driven decision-making.

CONTEXT AND PARTNERS

Durham County is located in the Central Piedmont area of North Carolina, where African Americans comprise the majority of residents. Although the county has a higher overall education rate than the rest of North Carolina, with 80% having a high school degree and 40% holding a bachelor's degree or higher, 17% of residents in the county live below the poverty level. In addition to poverty, 12% of county adults are living with type 2 diabetes. Diabetes prevalence is also disparate by race in the state of North Carolina. According to the North Carolina Diabetes Prevention and Control Program, diabetes prevalence is highest among African Americans at 13.8%, compared to 10.4% in whites.

To meet the needs of patients with diabetes, Duke University developed a program for Durham County residents. The diabetes program had four goals to: 1) Improve population-level management, health outcomes, and quality of life for diagnosed and undiagnosed adults living with type 2 diabetes; 2) Reduce disparities in diabetes management, health outcomes, and quality of life for adults living with diabetes; 3) Implement a countywide, community-based, population-level suite of interventions that is sustainable and replicable in other American communities; and 4) Build effective spatially-enabled informatics systems that support the development and implementation of the interventions and allow for real-time monitoring and evaluation.

Partners in the Durham County Diabetes Program include:

- Duke University Medical Center
- Durham County Department of Public Health
- Durham County Community Partners
    - Healing with CAARE
    - Lincoln Community Health Center
    - East Durham Children's Initiative

    - El Centro Hispano
    - NC Cooperative Extension
    - American Diabetes Association
    - Durham Parks and Recreation
    - Ebenezer Missionary Baptist Church
    - John Avery Boys and Girls Club
    - Durham Housing Authority
    - The Conservation Fund/The Sojourner Group
    - Save A Lot Food Stores
    - People living with diabetes
    - Retired community members
- Duke Endocrinology
- Duke Translational Research Institute
- Duke School of Nursing
- Duke Community and Family Medicine

ASSESSMENT AND PLANNING

The DDC first assessed the problem of diabetes and diabetes-related barriers through gathering information and evidence from the local health department and Duke University Health System. The North Carolina Department of Health and Human Services estimated that 9.3% of Durham County residents have been diagnosed with diabetes and another 2.2% have undiagnosed diabetes. Not only was diabetes high, but self-care and medical management were also poor. Only 24.2% had their HbA1c levels tested fewer than two times in the prior year, and 30.4% had not had an eye exam during the prior year. Additionally, in 2007/2008, 85.3% of persons with diabetes were overweight or obese. Modifiable risk factors that presented an issue for residents included: 1) 79.6% consumed less than the recommended number of fruits and vegetables; 2) 68.7% did not engage in physical activity; 3) 50% did not attend any diabetes education classes.

After assessing the problem, the DDC started the planning process to address diabetes within Durham County. A geospatial data-driven approach was used to inform intervention-planning efforts. An iterative process that involved looking at data, discussing it, and obtaining community expertise was employed to identify appropriate interventions within Durham County. Subsequently, a risk algorithm was developed to distribute patients into risk categories (e.g., low, moderate, or high). This risk algorithm was used to inform clinical interventions. High-risk patients received both education and clinical services from a clinical care team comprised of a nurse practitioner, social worker, registered dietitian, and community health assistant. They also received home visits and more contact hours with the clinical team. Moderate and low risk patients received diabetes education and support through telephonic coaching and a variety of programs implemented by a Neighborhood Intervention Team. Several teams carried-out the delivery of services related to this project. Table 1 summarizes the different teams and the tasks that were to be completed by each team.

Table 1: Durham Diabetes Coalition Team and Tasks

TEAM	TASKS
Analytics Team	• Included a team of statisticians overlooking project data • Conducted geospatial mapping • Developed the risk algorithm
Community Advisory Board	• Included the different partners collaborating as part of the effort to address diabetes • Created Sub-committees (e.g. finance committee, which focused on transparency) • Held monthly meetings • Selected pilot neighborhoods
Communications Team	• Included Diabetes Information Officers (DIO) • Tasked with raising the awareness level of diabetes among Durham County population using messaging and various media outlets • Developed the Living Healthy Television program • Expanded DDC Social Media Presence (YouTube, Facebook, Twitter, Instagram, etc.) • Developed a Website (contains valuable information and resources for the community) • Delivered messaging about upcoming events, engaged Univision (Spanish media), Radio One, developed press releases, communicated with county commissions, and invited Hollywood actor to speak about diabetes.
Community Health Workers	• Worked closely with the clinical team • Conducted home visits • Delivered direct support to patients
Clinical Team (Duke Medicine)	• Provided individualized clinical care for patients (e.g., medication management, medical examinations) • Provided self-management recommendations (e.g., healthy eating, physical activity, medication management) • Telephonic Coaching (one-on-one support)
Neighborhood Intervention Team	• Included five Community Health Integrators that focused on various issues (e.g., men's health, Latino health, food insecurity, community and clinical connections, and support). • Focused on community mobilization • Used Stanford's Chronic Disease Self-Management Program and Diabetes Self-Management Programs to provide Diabetes Self-Management and Support
Project Leadership	• Included executive team, which managed the project at the principal investigator level • Addressed challenges and barriers to program delivery • Coordinated the hiring of staff • Developed and implemented the Community Mini Grant projects • Conducted administrative tasks and managed the project

INTERVENTION COMPONENTS

The Durham Diabetes Coalition with local partners implemented a comprehensive intervention at the individual, community, and county levels. Table 2 below summarizes the intervention components, specific elements of the Durham Diabetes Coalition, and the modes of delivery of intervention elements.

Table 2: Durham Diabetes Coalition Intervention Components, Elements, and Modes of Delivery

INTERVENTION COMPONENTS	SPECIFIC ELEMENTS	MODE OF DELIVERY
Diabetes Self-Management Education	• Evidence based Stanford Stanford's Diabetes Self-Management Program curriculum delivered at group classes held at the library or other community settings • T2DM conversation mapping delivered through group sessions at community based organizations in targeted communities • Telephonic coaching modules delivered through phone calls to patients with diabetes reached by the clinical team at the health department, community-based organization locations, and at Healing with CAARE • Individualized educational information sessions conducted during home visits based on patient needs	• Community Health Integrators (CHIs) delivered the Stanford CDSMP and DSMP. • CHIs delivered T2DM conversation mapping. • Community Health Assistants and Community Health Workers delivered telephonic coaching. • Nurse practitioners and registered dieticians conducted home visits.
Support for Managing Diabetes and Distress	• Clinical team delivered support through home visits, interactions at community events, and via phone calls • Patients and community members connected to resources based on needs (e.g., housing, food, transportation and mental health supports, etc.) • Direct referrals to diabetes support groups and use of professional networks to learn about new diabetes resources • Identified food insecurity as a major issue impacting patients and created a diabetes food pantry and support group for patients living with diabetes	• Nurse Practitioners, Licensed Clinical Social Workers, Registered Dietitians, Community Health Integrators, and • Community Health Assistants • Clinical team, Community Advisory Board partner, and neighborhood intervention team,
Enhanced Access/Linkage to Care	• Clinical team receives patient referrals, completes the risk algorithm, and links patients to services based on risk classification • The following resources were offered based on patients' risk scores: home visits, communication with a PCP, and links to medical resources (e.g., medical nutrition therapy, diabetes self-management education), and link to community resources • Clinical team leadership provides endocrine consults to providers with patients at the Federally Qualified Community Health Center • Distribution of DDC community resource guides to patients and community members • DIO managed DDC website and develop the Living Healthy television show that is disseminated to all Durham County residents via local cable access TV station, web, and YouTube	• Clinical Team • Clinical Team, Primary Care Providers, and Patients • Clinical Team Leadership • Community Health Integrators, Clinical Team, and Providers • Diabetes Information Officers (DIO)

	• What's the 411 Workshop series	• Clinical, Community Health Integrator
Improve Quality of Care	• Training of primary care providers and practice staff to be diabetes champions within their practice/clinic to enhance primary care delivery for insulin administration, diabetes self-management (hypo/hyperglycemia), and connections to community resources • Contact primary care providers to refer high risk and uncontrolled patients with diabetes to the DDC team	• Physician • Clinical Team
Community Organization, Mobilization, and Advocacy	• Project staff reached out to community partners with interests in diabetes to share information from targeted communities and priority areas • The Coalition created an active Community Advisory Board and sub-committees to provide guidance from the community • DIOs used various communication campaigns and strategies (e.g., Facebook, Twitter, website, chats, television show, etc.) to provide Durham County residents information about diabetes • Deployed DIOs to implement communications campaigns to provide community members with practical information and diabetes support services within the county • Deployed CHI to targeted communities to increase community participation in targeted area • CHIs used personal contacts with community members to mobilize the community and advocate for the integration of diabetes messaging at existing meetings • Created a new partnership with Durham Housing Authority to incorporate a diabetes healthy living moment during mandatory residential council meetings. • Developed strong partnership with the American Diabetes Association to increase awareness of diabetes in Durham County • Radio One	• Project Staff and Community Partners • Diabetes Information Officers (DIO) • Community Health Integrators (CHI)
Health System and Community Transformation	• Data sharing agreement strengthened data linkages between Duke University and Lincoln Community Health Center FQHC and provides technical expertise to the FQHC to enhance their reporting capabilities • Creation of a Datamart that links data from multiple sources for quality improvement and research and provides a more complete picture of diabetes in Durham County • Health system support provided to transition FQHC over to the EPIC system that will allow for a common electronic medical health record	• DDC IT and Analytics Staff • Executive Leadership supported Lincoln FQHC
Other	• Mini-grants awarded to more than 20 community partners to extend diabetes programs and services throughout the county	• Community Advisory Board and Finance Sub-Committee.

STORY OF COMMUNITY TRANSFORMATION

Durham County residents have experienced both racial and socioeconomic inequalities such as limited literacy, financial concerns, transportation barriers, and limited resources (e.g., food options, places to engage in physical activity, etc.). Inequalities within the physical and social environment presented challenges related to health disparities such as high rates of obesity, diabetes, and heart disease. Additionally, some behavioral risk factors for the population include: 1) Lack of chronic disease management; 2) Medication non-adherence; and 3) Lack of self-monitoring blood glucose. There are additional barriers to diabetes care such as life stressors, fear of hypoglycemia, fear of needles, mental illnesses, and other chronic diseases interfering with diabetes management.

To address the many challenges in Durham County, the Durham Diabetes Coalition and community partners developed a multilevel intervention to address barriers to diabetes care and make changes to the social and physical environment. First, the team connected patients to a primary care provider and a support group that included other people experiencing the same health concerns and related barriers. Second, patients were linked to community resources to assist with transportation, health insurance application, disability process, diabetes testing supplies, and meal programs. Third, clinical services were also provided to patients with diabetes. Those included: 1) Diabetes self-management education; 2) Self-monitoring blood glucose; 3) Diabetes medication adherence education and support; and 4) Prevention of diabetes complications. Additionally, patients received additional support such as the reminders to increase medication adherence. Lastly, behavioral support was provided through: 1) Positive reinforcement; 2) Smoking cessation classes, 3) Behavioral therapy, 4) Medical nutrition therapy, and 5) Referrals to psychiatry.

Because of the efforts of the Durham Diabetes Coalition and the many community partners who worked to enhance the conditions of people with diabetes, both social and environmental conditions improved considerably. The diabetes interventions had a positive impact on individuals, families, and communities—transforming neighborhoods in Durham County. After the interventions were introduced, the clinical team saw decreased HbA1c, hypoglycemia events, and hospitalizations; better blood pressure control, understanding of diabetes medications, food choices, and diabetes self-management among participants. Neighborhoods are also requesting walking trails and gardens to increase access to physical activity and healthy nutrition. Because of the community changes made by Durham County to improve the health of its citizens, the county was one of six to receive the Robert Wood Johnson Foundation's Culture of Health Prize in 2014.

STORY OF PERSONAL TRANSFORMATION

A 60-year-old African American male, a Durham County resident, developed type 2 diabetes for years and his condition became poorer over time. This gentleman has a history of stroke, cardiomyopathy, elevated HbA1c at 13.2% (dangerous), multiple injuries due to frequent falls from fainting, and bipolar depression. Adding to the problem, this patient took multiple medications and numerous providers including neurology, cardiology, endocrinology, gastroenterology, and psychiatry. The patient was linked to the Durham County diabetes intervention and was connected to one primary care provider and a comprehensive clinical team that was tasked with supporting this patient to control his diabetes. The primary care provider referred the patient to Medicaid and Medicare coverage. Additionally, the clinical team identified food insecurity as a major barrier to diabetes self-management and at the same time noted patient resources (e.g., family support, home health aide, phone availability). Additionally, the team linked the patient to a senior *PharmAssist*, Meals on Wheels,

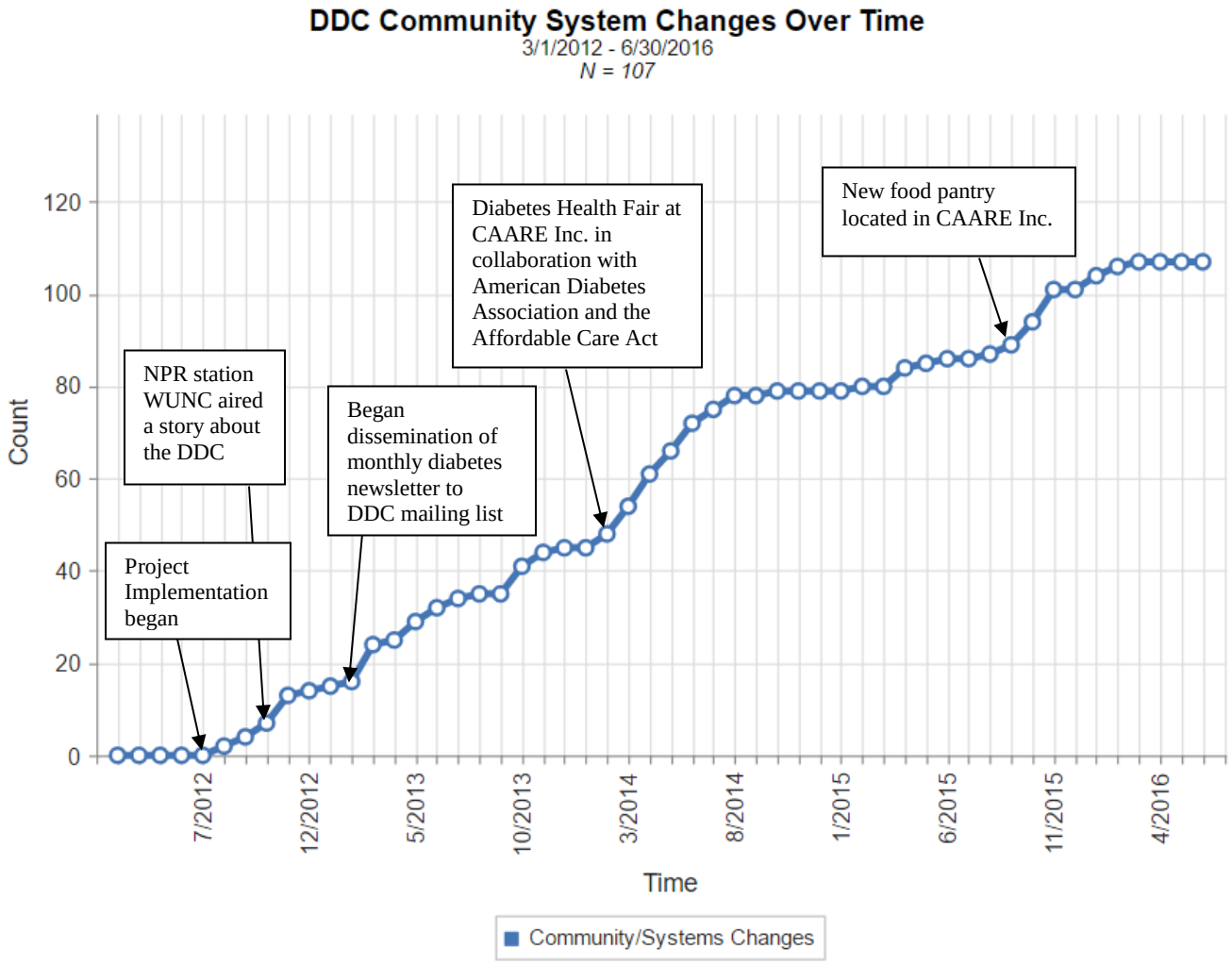
Congregate meals program, emergency community food resources, DDC food pantry, and Section 8 housing support. Furthermore, the patient received titrated insulin as needed due to hypoglycemia, set-up a new glucometer, and was prescribed a statin. After a 12-month intervention period, this gentleman decreased his HbA1c levels from 13.2% to 7.4%. He increased healthy food intake, is more physically active, has fewer prescriptions, and reduced his depression.

EVALUATION RESULTS AND FINDINGS

Data on Project Implementation

Figure 1 displays the cumulative number of community and system changes implemented by the Durham Diabetes Coalition. [Note: In a cumulative graph, each new activity is added to all prior activities. The steeper the line, the higher the rate of services that were provided]. Defined as new or modified programs, policies, or practices, community/system changes implemented by the DDC included starting program implementation, beginning monthly newsletters, development of a walking trail, health fairs, development of a food pantry, and various other events. Following the planning period (1/2012 to 7/2012), there was a marked increase in community/system changes. From March of 2012 to June of 2016, there have been more than a hundred community/system changes as part of the BMS Foundation Funded initiative.

Figure 1: Durham Diabetes Coalition Community/System Changes Over Time



<u>Anecdotal Evidence</u>

Diabetes Support Group and Food Pantry Participant*: "Ever since I been attending these meetings my A1C has gone down! Plus, I have lost some weight and I am feeling much better than I did before. I just love coming here!"*

Dr. Susan Spratt, Physician Lead DDC Clinical Team and Director of Diabetes Services, Duke University Health Systems: *"We are working on ways to sustain our efforts and trying out group visits and the food pantry model along with other models. We find that the food pantry at CAARE is growing in numbers every week and we want to continue those efforts any way we can and write up other things so that people can gain from our experience."*

Melvin Green, Residential Services Program Manager, Durham Housing Authority-Residents Service Department: *"The Durham Diabetes Coalition has had a very positive impact on the communities served by the Durham Housing Authority. Many of our residents are living with diabetes and are benefitting from DHA's partnership with the DDC. Residents have been able to participate in a vast array of programs and services."*

Data on Clinical Outcomes

Data on clinical outcomes will be available Spring of 2017.

WHAT WE ARE LEARNING

Duke University and partners helped identify facilitating and restraining for the Durham Diabetes Program. Facilitating factors that made the program easier to implement include:

- The Durham Diabetes Coalition is made up of a strong team with various areas of expertise and a common vision to move the needle on diabetes in Durham County, NC.
- Developing the risk algorithm that places patients into low, moderate, or high-risk groups and guides interventions for patients in conjunction with recommendations from providers allowed for tailoring the intervention based on patient needs.
- Willingness to be innovative and think outside the box to implement a range of interventions for high, moderate, and low risk diabetes patients.
- On-going communications and group meetings with health care, informatics, and public health staff as well as community partners, patients living with diabetes, and project leadership allowed for new and modified intervention components.
- A marvelous community advisory board and strong collaborative partnerships allowed for data-driven and community-driven interventions.
- Community health workers connected well with patients, used creativity to reduce barriers to diabetes self-management, and motivated patients to take action and increase health behaviors.
- Meeting people "where they are" (e.g., home, community buildings, church, salons, parks, etc.) and being receptive to different viewpoints was important in assuring continued participation.
- Duke University led workshops have been successful in engaging community members in diabetes education. Workshops are interactive and community members have a chance to ask questions and receive complex answers in easy to understand terms, reducing barriers between patients and healthcare providers.

Restraining factors that made the program more difficult to implement include:

- Hiring the right staff, scheduling patients, and engaging the community takes time.
- Patient challenges (e.g., mental health issues, substance abuse, transportation, stage of readiness, food insecurity, medication non-adherence, financial burdens, co-morbid conditions, and other social determinants of health impact patient choices and health outcomes)
- Home visits are very beneficial but can be an intense experience for staff due to: safety, drug use, domestic violence, hoarding, smoking, vermin, medical crisis, refusal of intervention components, and no shows.
- Charting in multiple documentation systems across organizations increased administrative time for clinical team staff.

The Durham Diabetes Coalition made some adjustments over the project period to improve its efforts. Those adjustments include:

- Refined the risk algorithm to include social factors and received feedback from providers.
- Instituted multiple communication strategies to ensure that everyone is on the same page across workgroups and clinical teams.
- Reallocated resources based on feedback received from community partners and helped community partners with identified needs (e.g. FQCHC reports, diabetes and endocrinology referrals, etc.)

- Addressed food insecurity by developing a diabetes food pantry and support group.

MOVING FORWARD AND PLANS FOR SUSTAINABILITY

Sustainability is a priority for the Durham Diabetes Coalition. At the end of the project, the Coalition will have mobilized community partners, a functional data platform, an enhanced workforce, a capability for targeted interventions, an enhanced quality of care for people living with diabetes, community tools and resources, and improved health outcomes. Below is a list of specific examples of sustainability tactics the Durham Diabetes Coalition plans to use to sustain the project.

TACTICS OF SUSTAINABILITY	SPECIFIC EXAMPLES OF HOW TACTIC IS USED
Share positions and resources with organizations that have similar goals	Placed clinical team members at the health department to extend expertise and services provided. Provided diabetes resource guide to providers, community members, community advisory board partners, and SEDI partners.
Incorporate the initiative's activities or services into another organization with a similar mission	Collaborated with the Duke Cancer Center, Lincoln Community Health Center, Durham County Department of Public health to provide targeted A1C screenings at Men's Health Events held annually. Integrated diabetes support group and food pantry at Healing with CAARE.
Apply for grants	Applied for a CMS Innovations grant and received funding that doubled the clinical and neighborhood intervention team size. Continue to explore grant funding opportunities that align with priority areas and partners interests including: NIH, CDC, PCORI, HRSA, foundations, and corporations.
Tap into available personnel resources	Collaborate with providers on Ask the Doctor Panels, health fairs, workshops, and community events. Feature community partners in DDC media activities (e.g. DDC chats, Facebook, Twitter, cable television show, campaigns).
Solicit in-kind support	Receive in-kind support for hemoglobin A1c analyzers, BP machines, glucometers, strips, and educational resources from Duke, American Diabetes Association, and pharmaceutical representatives, etc.
Develop a fee-for-service structure	Shadow billing at the Department of Public Health to demonstrate potential revenue that could be generated by clinical team members.

PROJECT PUBLICATIONS AND MATERIALS

Publications and Presentations:

- Spratt, S. E., Batch, B. C., Davis, L. P., Dunham, A. A., Easterling, M., Feinglos, M. N., ... & Miranda, M. L. (2015). Methods and initial findings from the Durham Diabetes Coalition: Integrating geospatial

health technology and community interventions to reduce death and disability. *Journal of Clinical & Translational Endocrinology*, *2*(1), 26-36.

Project Materials:

- Evidence based Stanford's Diabetes Self-Management Program Curriculum

PROJECT CONTACT INFORMATION

Lisa P. Davis
Duke University, Senior Project Manager
Email: lisa.p.davis@dm.duke.edu
Phone: 919-668-0028

EVALUATION CONTACT INFORMATION

This case study was prepared by the Work Group for Community Health and Development team (Ithar Hassaballa, Charles E. Sepers, Jr., Jerry Schultz, & Vincent Francisco) at the University of Kansas http://communityhealth.ku.edu, in collaboration with the Duke University, and as part of the evaluation of the BMS Foundation's Together on Diabetes initiative.

Charles E Sepers, Jr, Evaluation Project Coordinator
Work Group for Community Health and Development, University of Kansas
Email: csepers@ku.edu
Phone: 785-864-0533

Jerry Schultz, Co-Director
Work Group for Community Health and Development, University of Kansas
Email: jschultz@ku.edu
Phone: 785-864-0533